CELEBRATING NATURE-CULTURE RELATIONSHIPS

NEGOTIATING LOSS AND CONTINUITY: NATIVE TREE–HUMAN RELATIONSHIPS IN THE WESTERN GHATS OF KODAGU, KARNATAKA

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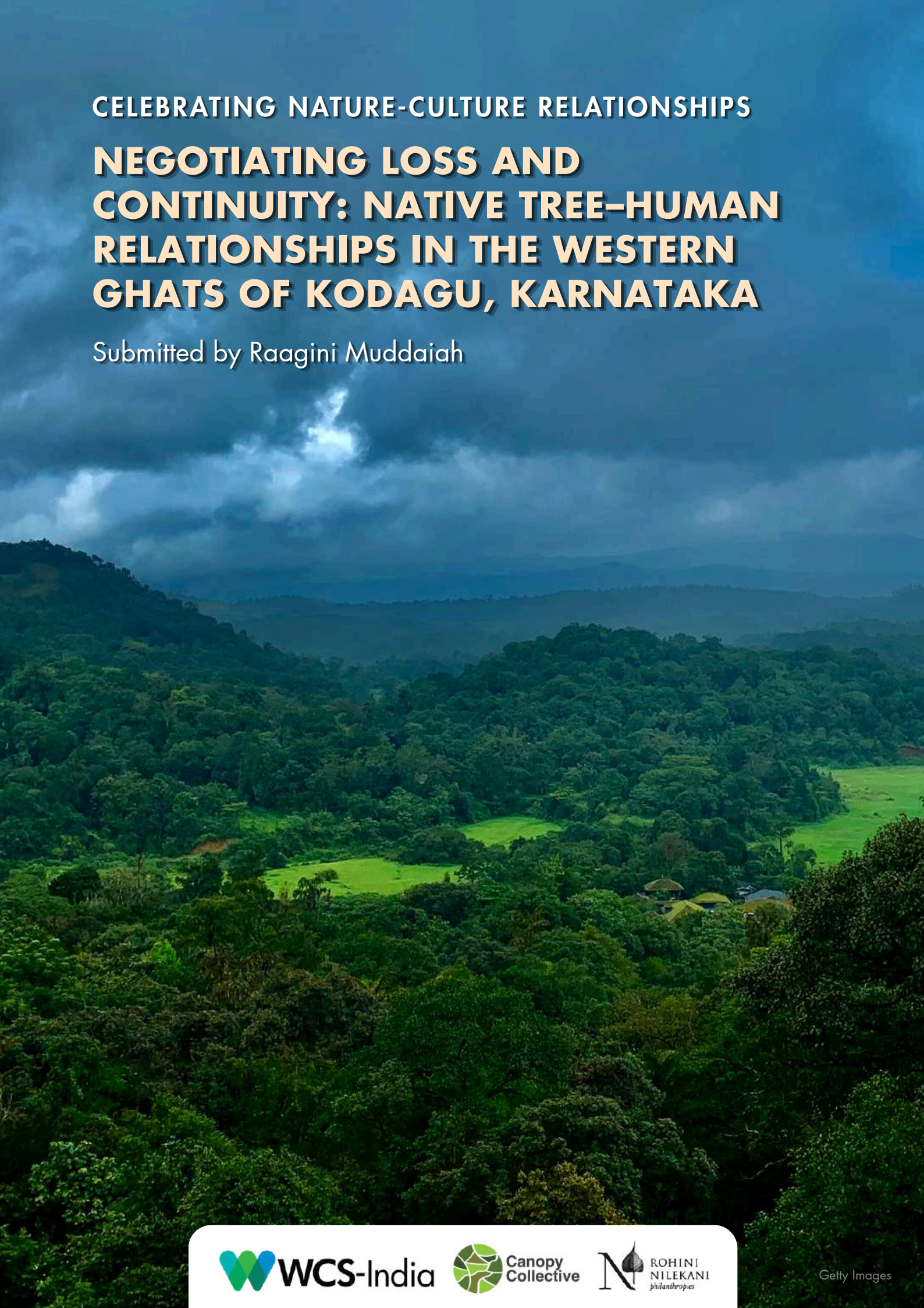

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Malabar Grey Hornbill | Nepe Shatsang

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ABSTRACT

Among the Indigenous nature-worshipping communities of Kodagu, native trees serve as preconditions for ritual, livelihood, and everyday cultural life. While studies worldwide have recorded the present-day significance of such nature-culture relationships, there is limited literature on how native trees are symbolically understood amid shifting aspirations in Kodagu, India. To address this gap, we conducted semi-structured interviews and participatory walks with respondents from four Indigenous communities, examining the community-specific drivers underlying the persistence, transformation, or loss of tree-human relationships. We found that while ritual use of trees remain widespread, the ecological knowledge underlying these practices is less consistently retained. The drivers of change, including displacement, market integration, and commercialisation of trees, differ substantially across communities. Beyond these material and ceremonial relationships, personal attachments to specific trees were sustained through nostalgia and childhood memory.

These findings suggest that the erosion of tree-related knowledge and practice in Kodagu is a product of distinct, community-specific histories operating across communities, even as both ritual practice and intangible bonds persist on their own terms. These findings can inform broader discussions on the persistence of tree-human relationships, and aid in designing management programs to support native tree diversity in Kodagu's agroforest landscape.

Keywords: Native trees; Indigenous; local communities; nature-culture relationships; ritual use; intangible relationships; Kodagu; Western Ghats

Pepe Shatsang

INTRODUCTION

Traditionally, trees have been held in widespread reverence across cultures and communities. Trees occupy a central place in shaping cultural and social systems, often embodying spiritual and symbolic meanings (Coder, 2021). Intricate stone carvings from the ancient Mesopotamian Assyrian civilisation depict a 'Tree of Life'- a tree with nodes and crisscrossing lines - interpreted as representing cosmic order and divine connection (Giovino, 2007). Buddhism places great emphasis on the Bodhi Tree (*Ficus religiosa*), as the Buddha is believed to have attained Enlightenment beneath this tree, highlighting the tree's significance as a metaphor for refuge and protection (Chai & Rho, 2020). Across India, reverence for trees is expressed through sacred groves, which are community-protected patches of forest associated with local deities (Malhotra et al., 2001). The symbolism of trees is evident even in science and evolution, where naturalist and biologist Charles Darwin uses the metaphor of a branching tree, similar to the Tree of Life, for his theory of evolution (Darwin, 1971).

In addition to cultural systems, trees have also become integral to economic systems in the form of timber, fuel, construction, and sustaining livelihoods through non-timber forest products (Woodard & Milner, 2016). Commercialisation of forestry in India began with species like teak (*Tectona grandis*). Teak was one of the first species to be established as plantations for purely commercial purposes, causing a fundamental shift in how trees were valued and managed (Sasidharan & Ramasamy, 2021). Simultaneously, many tree species continue to sustain livelihoods - the seeds and flowers of the Mahua tree (*Madhuca longifolia*) are used to produce liquor and edible oil, supporting tribal communities in various parts of India (Nayak & Sahoo, 2021); and black dammar (*Canarium strictum*) resin from the Western Ghats of India illustrates how traditional forest produce is being redirected toward industrial markets. Although historically collected for religious and medicinal purposes by the Kurumbas and Irulas of Tamil Nadu, it is now increasingly supplied to the varnish and incense industries (Augustine & Krishnan, 2006; Varghese & Ticktin, 2008).

The intangible dimensions through which trees are understood are just as significant as these tangible relations. Across India, trees are viewed not merely as resources but are regarded as sentient beings. In parts of rural India, nature-human relationships are embedded in Indigenous spiritual systems that persist alongside the more recent influence of Sanskritization (Walter, 2015). This spiritual understanding manifests in varied, region-specific ways. In Tamil Nadu, trees are sometimes ascribed gender: the peepal (*Ficus religiosa*) is considered masculine and the neem (*Azadirachta indica*) feminine, and the air under their intertwined branches is believed to promote fertility (Fowler-Smith, 2018). They are often 'married' to each other in ceremonious maram kalyanams, or tree weddings (Venkatesan, 2021). Similarly, in the Tulunadu region of

coastal Karnataka, trees are believed to embody spiritual identities. The Devil's tree (*Alstonia scholaris*), believed to be a reincarnation of Bali, the king of demons, is worshipped during the Deepavali festival, when Bali is said to visit Earth (Adiga & Adiga, 2019; Bhandary, 2020). Branches of the Devil's tree are also used in Kerala during *sarpam thullal* (snake dance), where serpent gods are worshipped in forest groves called *sarpa kavu*. The field of performance is marked by placing four pillars made of its branches (Kumar, 2008). As seen in these practices, rather than being simple backdrops to human life, trees emerge as central to the socio-cultural fabric of life.

Among the Indigenous communities of Kodagu district in Karnataka, native trees have historically been woven into everyday life, playing a part in medicines, rituals and agricultural practices (Chinnappa, 2003). Certain trees are symbolic even in present-day birth, marriage and death ceremonies, and even feature in funeral and marriage songs (Dechamma, 2014). Below is an excerpt of the Chavu Pat (funeral song) from the book Paṭṭōlé Paḷamé (Chinnappa, 2003):

"In the dense forest, Ajjayya
The huge banyan tree, Ajjayya
Untouched by knife or axe, Ajjayya
Fell root and branch, Ajjayya
Likewise, you too, Ajjayya
Are uprooted, Ajjayya

The tallest tree in the village forest, Ajjayya
Is the flowering cappaya tree, Ajjayya
On the branch of that tree, Ajjayya
One out of every ten leaves, Ajjayya
Was perforated, Ajjayya
And broke at the stalk, Ajjayya
So too, are you broken, Ajjayya"

This song symbolises one of the many ways in which people share intimate connections with nature. Yet, none of these relationships is static - they remain in constant flux, shaped by shifting ecological conditions, cultural values and socio-economic transitions (Ingold, 2000). Within this context of transformation, a common global theme is the disintegration of human connection with nature, of which trees are the foundation (Restall & Conrad, 2015; Marczak & Sorokowski, 2018). Limited engagement with nature is thought to shape perceptions that downplay human reliance on nature and weaken ethical concern and responsibility toward non-human entities. In contemporary capitalist societies, land has increasingly been conceptualised as separate from human life - as the 'other' (Fowler-Smith, 2018). This fosters disaffection towards nature, accelerating the ongoing environmental destruction (Soga & Gaston, 2016). This trend is particularly concerning in an era marked by rising atmospheric carbon and unpredictable climatic patterns.

Contemporary transformations in Kodagu, including urbanisation and the commercialisation of agriculture, have gradually reshaped land-use patterns and, with them, peoples' everyday interactions with native trees (Nath, 2010; Leroy et al., 2011; Somaiah, 2022). Despite these shifts, some socio-cultural relationships between communities and native trees continue to persist, while some have evolved or disappeared (Dechamma, 2014). Much of the existing literature on native trees in Kodagu remains focused on documenting traditional ecological knowledge, ceremonial uses and livelihood support (Karun et al., 2014; Shruthy, 2019; Poonacha, 2024), offering limited insight into how socio-cultural relationships are reworked in the present. Recent scholarship has begun to address the cultural and ecological dimensions of Kodagu's plant relationships through a bioregional and decolonial lens, specifically examining how colonial plantation expansion has reshaped Kodava attitudes toward native species (De, 2023, 2024). However, De's (2023, 2024) work is based primarily on literary and single-community (Kodava community) analysis. There is limited empirical literature on how these relationships vary across Kodagu's Indigenous communities, or on how socio-cultural and economic drivers shape their persistence, transformation or loss in the present day.

This study aims to fill these gaps by contributing to discussions on the motivations behind the persistence of contemporary relationships between people and native trees in Kodagu. We do this through:

- Examining and documenting the present-day cultural relevance of native trees through interviews,

- Analysing the evolution of individual relationships with native trees across socio-cultural and landscape practices in Kodagu using interviews and oral histories, and

- Identifying the socio-cultural and economic motivations influencing perceived transformation, persistence, or disappearance of people-tree relationships in the present context of Kodagu.

Results from this research have the potential to contribute to developing management programs that support native tree diversity in intensively managed agroforest landscapes in Kodagu.

Ficus religiosa | Getty Images

STUDY AREA

Kodagu district in Karnataka state of India forms a part of the Western Ghats biodiversity hotspot, famed for its high degree of endemism and rich biodiversity. The district, covering an area of 4102 km^2, is home to the Brahmagiri, Pushpagiri and Talakaveri Wildlife Sanctuaries, as well as the Nagarahole National Park. Kodagu is characterised by a mosaic of evergreen and moist deciduous forest fragments, sacred forests called *devarakadus*, rice fields and coffee plantations dotted with irrigation tanks (Narayana, 2015). The name 'Kodagu' is derived from the word '*kodimalenad*' meaning 'high forestland' in Kodavathak, the language of the Kodavas, probably referring to dense forests and steep mountains that are characteristic of the district (Richter, 1870).

However, since pre-colonial times, the Indigenous communities of Kodagu lived as forest dwellers, with belief systems rooted in forests and rivers (Richter, 1870). Records indicate that Kodagu was inhabited by communities such as the Kurubas, Yeravas and Kudiyas in the 10th century, with the Kodavas and Gowdas settling in the region around the same period (Karnataka Gazetteer Department, 1993). Each community had distinct cultures, customs, traditions, and languages (Prabhakar & Patil, 2023). Some scholars suggest that the Kodavas later emerged as the politically and militarily dominant community (Ganapathy, 1967). However, the origins of the Kodavas still remain contested, and there is no definitive historical record of when they first arrived in the region (Ramineni et al., 2024).

With the arrival of the Haleri rulers in the 17th century and the British annexation in the 1830s, small patches of land began to be cleared to grow paddy (Bopanna, 2022; Prabhakar & Patil, 2023). Coffee was introduced and grown in Kodagu as a backyard crop, and it wasn't until 1854 that the British set up their first coffee plantation. Since then, large tracts of forest land have been converted to coffee plantations at the cost of ecological diversity (Bhattacharya, 2014). Colonisation disrupted the indigenous way of life in terms of ecology, occupation and culture. In the early 20th century, the Indigenous communities who were originally hunter-gatherers began to adopt the colonial coffee plantation culture (De, 2023). However, the ancient devarakadus were left untouched. According to a Forest Department survey, Kodagu has 121 deities who are worshipped across 1214 devarakadus, covering around 2% of the district's land area. This density of sacred groves is thought to be one of the highest in the world (Kushalappa & Raghavendra, 2012). All devarakadus have common elements: their namesake deity, each of whom has unique rituals associated with their worship, and a place to offer ritual animal sacrifices (Kushalappa & Raghavendra, 2012).

Currently, the economy of the district is mainly dependent on agriculture, with a rapid, widespread shift from paddy cultivation to coffee and pepper cultivation (Leroy et al.,

2011). Kodagu contributes one-third of the coffee produced by India, and coffee is a major player in the culture and socioeconomics of the district (Coffee Board, 2026). Traditionally, much of the coffee is grown in an agroforest system with the retention of native forest trees (Nath, 2010).

According to the latest 2011 census, Kodagu has a population of 5,54,519 people. Major tribal communities in Kodagu classified under the Scheduled Tribes (ST) and Scheduled Caste (SC) categories comprise Yeravas, Kurubas, Kudiyas and Soligas, among others. The ST population in the district is 58,054 (10.5%), and the SC population is 73,584 (13.3%; Census India, 2026). The Kodavas, who used to be classified under the 'Other Backward Classes' category, were merged under the 'Hindu' category during the 1941 census. Hence, there is no figure for the precise number of Kodavas today, although some estimate Kodavas to comprise 15-20% of the total population of Kodagu (Kalam, 2023). The total literacy rate of Kodagu district is 82.6%, which is higher than the average 73% literacy rate of Karnataka state (Census India, 2026).

Kodagu is divided into five main administrative divisions or taluks – Somwarpet, Madikeri, Kushalnagar, Virajpet and Ponnampet. Given that fieldwork was constrained to three months, and given my familiarity with Madikeri, Virajpet and Ponnampet taluks, this study was conducted in these three taluks as depicted below (Fig. 1).

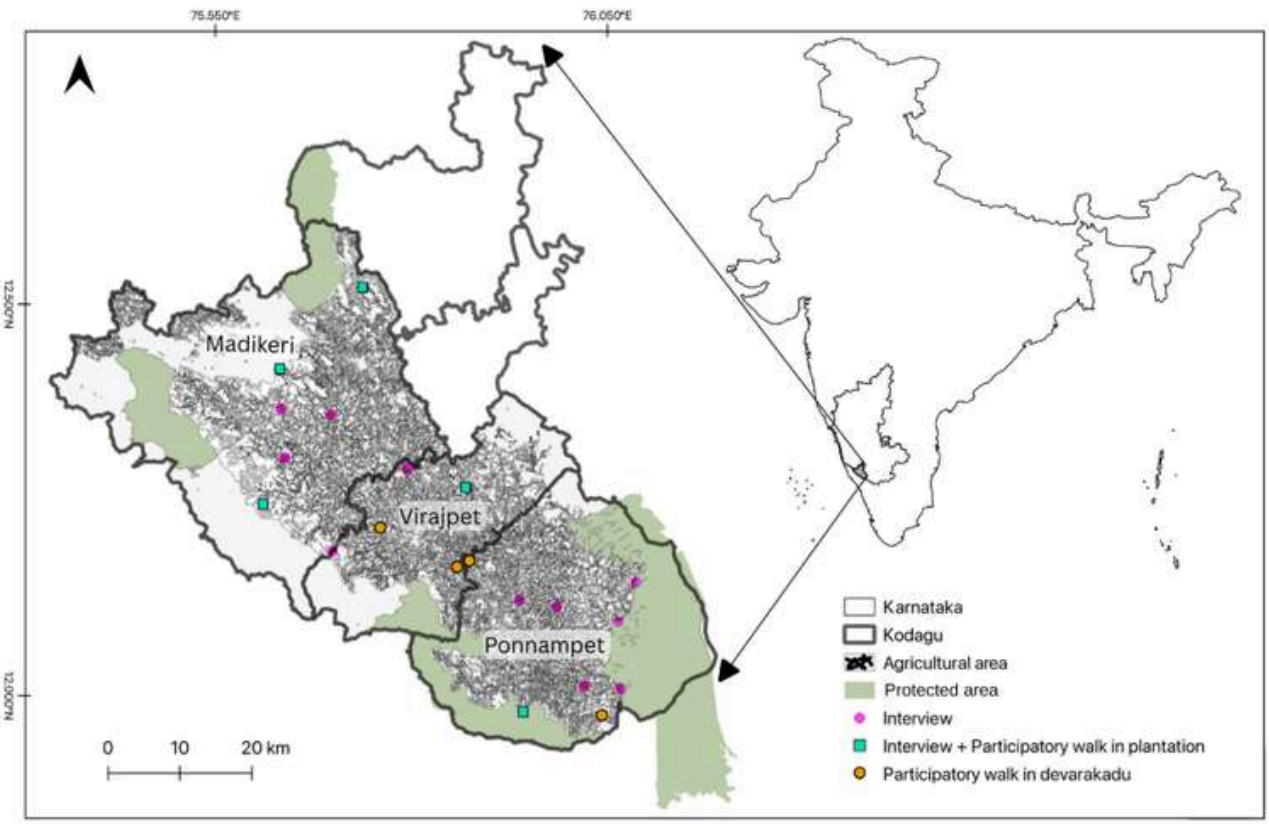

Fig. 1: Map of Kodagu district with points depicting the locations of interviews and participatory walks

METHODOLOGY

This study examines the current relevance and motivations shaping people's relationships with native trees in Kodagu. To achieve this, the research adopted a qualitative methodology combining semi-structured interviews and participatory walks.

My positionality as an educated individual who was born and continues to live within the community is acknowledged and critically reflected upon throughout the research process. This enquiry into native tree-human relationships in Kodagu emerges from lived experience: an awareness of landscape transformations since my childhood, coupled with three years of conducting biodiversity surveys across the region. A common theme I observed across coffee agroforests in Kodagu is the intensive pruning and, in some cases, the removal of native tree species. However, as someone from a family-run coffee plantation, I understand the economic pressures and aspirations that often shape these management decisions. Being a Kodava native from this study area, compounded by the ecological research I have already conducted with Kodavas in this landscape, facilitated access to Kodava respondents and enabled more open engagement during interviews. However, reaching people from the Kuruba, Kudiya and Yerava communities proved more challenging. These difficulties are shaped by existing social hierarchies, wherein Kodavas are perceived as the dominant landholding community, potentially influencing both access and the dynamics of my interactions. Additionally, members of the Kuruba community expressed hesitation in engaging with researchers interested in trees and forest use. They described concerns that sharing accounts of their relationships with trees and forest practices had previously been used against them, contributing to increased scrutiny and potential restrictions on their access to forest resources. This was partially overcome by reiterating the anonymity that I would maintain and describing that this research would not focus on patterns of forest resource extraction; rather, it would focus on understanding values and relationships they, as individuals, associate with trees.

Sampling Design and Participant Selection

Participants were identified using a purposive, stratified sampling design supplemented by snowball sampling. A total of 22 participants belonging to the Kuruba, Kudiya, Kodava and Yerava communities were interviewed. Purposive, stratified sampling was used to ensure representation across key socio-demographic and livelihood categories within communities. Participants were selected to reflect diversity in gender and age. However, only individuals aged 20 years or older were included, as some studies (e.g., Hunn et al., 2002; Reyes-García et al., 2014) suggest that the accumulation of traditional knowledge peaks in the late teenage years. Factors such as level and place of education, occupation and place of occupation, time spent in Kodagu annually, and approximate size of agricultural landholdings were also considered to include a broad range of stakeholders

and perspectives. Initial participants identified through purposive, stratified sampling introduced me to additional individuals with knowledge of the medicinal or cultural aspects of trees, as well as others with a general interest in trees.

In addition to permanent residents of Kodagu, the sample included four individuals who reside and work outside Kodagu but retain ancestral land and visit periodically, and three individuals who returned to Kodagu after spending several decades outside the district. Their inclusion enabled comparative analysis of how sustained, everyday engagement with native trees and cultural practices differs from more episodic exposure, and how varying degrees of physical presence in the landscape influence knowledge and practices related to native trees.

Ethical Considerations and Informed Consent

Approval to conduct this study was obtained from the Human Research Ethics Committee at Wildlife Conservation Society - India (HREC-2026-02). Following this, Free, Prior and Informed Consent (FPIC) was obtained orally from all individuals participating in this project, along with providing a detailed overview of the research objectives. Before meeting potential participants, an initial phone call was conducted to explain the scope of the project. In cases where participants required further clarification and had access to a digital device, a four-slide pitch deck presentation outlining the study was shared. Where digital access was limited, in-person meetings were arranged to clarify any concerns before proceeding with the interview. Three participants were unable to meet in person; hence, telephonic interviews were conducted. Interviews ranged from 25 minutes to two hours, with most interviews lasting one hour.

At the conclusion of each interview, the participant was presented with a small token of appreciation for their time, either in the form of local snacks, fruits, or a bottle of locally harvested honey.

Data Collection Methods

Interviews

Data collection began with a reconnaissance survey using a pilot questionnaire to develop a better understanding of the study population and refine the research questions and methodology. Following this, semi-structured interviews using a combination of closed-ended and open-ended questions were conducted with 22 participants during March and April 2026. Close-ended questions gathered demographic information such as age,

education, occupation, level of engagement with the Kodagu landscape, and agricultural landholding size. Open-ended questions included specific retrieval cues to prompt storytelling and encourage participants to share lived memories relating to native trees. I found that a good starting point was to elicit memories rooted in childhood nostalgia, which often led to a natural progression of narration towards their temporal relationships with native trees. This process relied on respondents' recollection of practices and experiences, which are subject to recall bias and capture their perspectives in a single point of time.

Fig. 2: Semi-structured interview being conducted with a member of the Kodava community (Photo - Millo Hailyang)

When new themes emerged during the interview process, additional topics of conversation were incorporated into subsequent interviews. Similarly, topics where responses had become repetitive were no longer pursued. Key informants were identified based on their long-term engagement with native trees in cultural, medicinal or agricultural terms, and their knowledge of historical landscape changes.

Interviews were recorded using a handheld Sony recorder with prior permission from participants (Fig. 2). Interviews were conducted in Kodavathak, Kannada, or English, depending on participant preference. Since I am familiar with these languages, I was able to translate and transcribe the interviews myself, with assistance from community members where required. Although every effort was made to translate culturally specific terms, some nuances in the respondents' local languages may not have fully carried over into English.

Participatory Walks and Field Observations

Where time permitted and with prior consent, participatory walks were conducted. These took place within devarakadus, coffee plantations and forested areas surrounding respondents' homes, enabling a contextual understanding of participants' relationships with native trees within lived landscapes (Fig. 3). The walks followed the pace of each participant, typically lasting between one to one and a half hours. As we moved through these spaces, participants identified trees, described their uses, and, in some cases, shared memories associated with particular individual trees or species. This information was a useful guide to compare insights between interview responses and observed practices.

A field diary was maintained throughout the research process to record observations and insights, with particular attention to the interview setting and other subtle factors that may have shaped participant comfort and engagement.

Fig. 3: A Kudiya community member pointing out fruiting shrubs during a participatory walk (Photo - Sharan V)

DATA ANALYSIS

This analysis draws on qualitative interview data comprising coded excerpts, supplemented by observations from participatory walks and field notes. The interviews, once conducted, were transcribed and read multiple times to develop a deeper familiarity with the data. Emerging themes were identified, and the transcribed interviews were coded using Delve Qualitative Analysis Software. Thematic coding revealed distinct codes, of which the most frequent are - tree use in festivals and ceremonies, intangible relationships with trees, utilitarian relationships with trees, and perceived cultural and landscape change.

RESULTS

Semi-structured interviews were conducted with 22 people - 15 individuals from the Kodava community (7 women, 8 men), 4 men from the Kudiya community, 2 men from the Kuruba community and 1 woman from the Yerava community. Participants ranged in age from 25 to 85 years with the median age being 49 years.

Income sources varied across communities – all Kodava respondents owned agricultural land ranging from approximately 8 to 60 acres, with some having alternate sources of income, and others having moved back to Kodagu to manage their plantations upon retirement. Kudiya respondents owned and cultivated agricultural land ranging from 1 to 5 acres, with additional income from unskilled labour. Members from the Kuruba and Yerava communities did not own land and worked on surrounding agriculture plantations.

Some Kodava interviewees (n=3) stated that prosperity increased over time through cardamom cultivation, and subsequently through coffee cultivation. Members of the Kudiya (n=3) and Yerava (n=1) communities indicated that their families had worked on cardamom and coffee plantations for generations, with alternate employment opportunities, such as work in the hospitality sector, emerging for the Kudiyas in recent years. Kuruba members (n=2) stated that historically, their families lived inside the forest and were displaced to the forest fringes in the latter half of the 20th century, after which they too began working on plantations.

Our four main thematic codes reveal a landscape in transition, one where ethnobotanical knowledge, ceremonial practice and ecological memory are simultaneously eroding and being actively defended. Across all interviews, native trees emerge not just as passive features in the landscape, but as active elements defining cultural practices, livelihoods, medicinal practices, ecological relationships and intergenerational memory. Across 22

interviews, 32 distinct tree species were discussed by participants with - chekke (jackfruit; (*Artocarpus heterophyllus*), mange (mango; *Mangifera indica*), aale (peepal; *Ficus religiosa*), bamboo (*Bambusa sp.),* botthe mara (*Schefflera sp.*), pane mara (fishtail palm; *Caryota urens*), hachinaru (Indian charcoal tree; *Trema orientale)* and thandi (baheda; *Terminalia bellirica*) - most frequently cited. Silver oak (*Grevillea robusta*) was the most frequently mentioned exotic species, appearing consistently in discussions of landscape change and shade management in coffee estates.

Present-day cultural relevance of trees

Trees emerged as significant to respondents across various aspects of everyday life, not only as material resources but also as entities woven into spiritual beliefs, cultural knowledge, and personal attachments. Several respondents expressed appreciation for the ecological functions of trees, such as maintaining water availability, providing shade, and supporting broader ecosystem processes. Some described developing personal attachments to particular species through familiarity and observation, while others expressed a sense of loss at trees they have not encountered since childhood.

The ceremonial significance of trees was evident in most interviews (86%; n = 19 [Kodava 12, Kuruba 2, Yerava 1, Kudiya 4]), regardless of age or community affiliation. However, while many practices continue to be maintained, respondents differed in their knowledge of species and the meanings associated with them. Trees continue to play an important role in Kodagu's ceremonial calendar, particularly during the Kaveri Shankramana and Puthari festivals. During Kaveri Shankramana, respondents described constructing the annual *botthe* (Fig. 4). Posts are constructed from branches of the *botthe mara* (*Schefflera sp.*) or bamboo (*Bambusa sp.*) and inserted into the ground. A woody creeper, *botthe balli* (*Gnetum ula*), is then twisted into a circular form and placed on top of the posts. Illustrating how trees and plants continue to be integral to cultural practices and broader ecological relationships, one respondent explained the significance of the botthe:

"When the rice crop comes, the rodents come for the crop. These rodents are controlled by owls. In the flat paddy field, there is no other place for the owl to sit, so this botthe is kept for them to sit on and monitor. The owls and birds sit there at night and catch rats."

More than half of the respondents (54%; n = 12) reported participating in this practice of pitching the botthe, although not all knew its significance, or where and how the materials were traditionally sourced.

Fig. 4: Kaveri Shankaramana botthe, constructed from branches of either botthe mara or bamboo, with the botthe balli placed on the top (Photo - Dilan Mandanna)

Similarly, the harvest festival of Puthari also relies on materials sourced from trees. Respondents described making a cone called *nere* by rolling together leaves from three to five specific tree species and inserting few sheaves of freshly harvested paddy into it (Fig. 5). The nere is fastened using fibres stripped from the hachinaru tree (*Trema orientale*), a species referred to by some as the 'Puthari mara'. While 86% of respondents (n = 19) reported tying a Puthari nere annually, only 54% (n = 12) could identify some or all of the constituent species, while none spoke of its significance. The peepal leaf was most common (n=11), followed by mango and *kummi* (gamhar; *Gmelia arborea*; n=5), *ger* (wild cashew; *Semecarpus sp.*) and jackfruit (n=4).

Beyond annual festivals, certain trees function as permanent sites of ritual activity and divine presence. Milky-sap-producing species, particularly peepal and jackfruit, were collectively referred to by Kodava respondents as *paal mara* ('milk trees'). Respondents associated the presence of latex with life force and vitality. As one participant explained:

"Only if you have life will you bleed when cut. If that tree bleeds, it has life."

Ritual offerings are commonly placed at the base of these trees, and local deities such as Chowndi and Kuliya are worshipped beneath them. Although revered by many, paal mara was also described as an inconvenience because water dripping constantly from its

leaves during monsoons damaged metal roads beneath it; yet its revered status prevented it from being cut.

Trees also featured prominently in death rituals. Respondents described tying the ashes of deceased relatives to paal mara following cremation. Branches of the *nidendhale* shrub (bandicoot berry; *Leea indica*) were used to construct the funeral bier, and mango wood was used in funeral pyres, while the fronds of *pane mara* were used during mourning rituals. The association of nidendhale and pane mara with death was considered sufficiently strong that its use was avoided during auspicious ceremonies such as weddings. The pane mara was also associated with specialised cultural knowledge through the practice of toddy extraction.

Trees remain important within local systems of knowledge. The *thandi* tree (baheda; *Terminalia bellirica*) was the most frequently cited medicinal species, mentioned by 22% of respondents. Participants described using its bark, fruits and seeds to treat a variety of ailments. In some cases, they are also associated with beliefs surrounding healing. One respondent recounted that his son's allergic reaction to the sap of a *kaadger* tree (*Holigarna arnottiana*) was cured after being instructed to circumambulate a thandi tree three times. Kurubas also use a variety of trees for medicinal purposes, such as the juice of crushed thandi or *honne* bark (Indian kino; *Pterocarpus marsupium*), or the water stored in the trunk of the *mathi* tree (arjuna; *Terminalia arjuna*).

Fig. 5 Puthari nere, which is made by rolling leaves of three to five specific tree species, with few sheaves of paddy inserted into it (Photo - Raagini Muddaiah)

Table 1 - Trees of cultural significance in Kodagu

Cultural significance	Tree species	Details
Kaveri Shankaramana festival	Botthe mara (*Schefflera sp.*) OR Bamboo (*Bambusa* sp.), botthe balli (*Gnetum ula*)	Two posts cut from either bothe mara or bamboo are inserted into the ground. Botthe balli creeper is twisted into a circular form and placed on the posts. This structure, called botthe, is placed in auspicious places around the house – granary, paddy field, well.
Puthari festival	Aale (*Ficus religiosa*), mange (*Mangifera indica*), chekke (*Artocarpus heterophyllus*), kummi (*Gmelina arborea*), ger (*Semecarpus* sp.), hachinaru (*Trema orientale*)	Leaves rolled into a cone called nere, filled with sheaves of paddy, fastened using bark strips of hachinaru and hung in rooms of ritual and domestic significance. Hachinaru tree is sometimes referred to as Puthari mara, named after the festival during which it is used.
Ugadi festival	Kekke (*Cassia fistula*)	Houses and implements are decorated with the yellow flowers of this tree, specifically within the Kuruba community.
Ritual offerings for wellness of the land	Aale and chekke	Offerings are placed at the base of these milky-sap-producing trees. Exudation of milky-sap when trees are injured is interpreted as a sign of life: "*Only if you have life will you bleed when cut. If that tree bleeds, it has life…If it doesn't have life, the milk won't come from the tree when you wound it.*" Chowndi and Kuliya deities are worshiped as stones placed at the base of these trees.

Death rituals	Aale, chekke Mange Pane mara (*Caryota urens*) Nidendhale (*Leea indica*)	Cremains tied to branches of aale/ chekke tree Mange used as firewood for cremation – "*That's why people always say, there has to be one mango tree near the house.*" Fronds used to fan mourners at funerals Branches woven together to make funeral bier
Non Timber Forest Produce collection	Cinnamon bark (*Cinnamomum* sp.), bamboo, thoora (rattan; *Calamus* sp.), kokke kaai (seeds of *Elaeocarpus* sp.), shikakai (*Acacia concinna*), nellikai (*Phyllanthus emblica*), dhoopa (resin of *Canarium strictum*)	Various produce collected from plants and trees: "*When there was shortage of money at home, people used to go collecting things from the forest… we still collect sometimes*"
Medicine	Thandi (*Terminalia bellirica*) Honne (*Pterocarpus marsupium*) Mathi (*Terminalia arjuna*).	Trees used as medicines: *"I had herpes once, when I went to the medicine man, he gave me the kashaya from thandi tree bark and it healed well";* *"Honne tree bleeds a red-coloured liquid…we squeeze the juice and drink it. The stomach ache will stop. Even now we use it";* *"We used to drink from the mathi tree if we had a stomach ache…the trunk has water"*

Firewood	Thadle (*Olea dioica*), koomathi (*Dimocarpus longan*)	Trees used as firewood: *"For firewood we use thadle, koomathi. Sometimes when we shadelop, we use those cut branches as firewood";* *"For the monsoon we make firewood, we have to cut trees. But we're careful when we cut, we don't cut the whole tree, we only remove the shade in a way that the tree doesn't die."*
Timber	Silver oak (*Grevillea robusta*)	Exotic silver oak is the preferred timber species – provides shade for coffee and is a good support for pepper vines. Unlike most native trees, felling of silver oak is not Government regulated: *"I only (cut) silver oak, because for that you don't need permission".*
Shade and Water Regulation	Native tree species	*"Why are the rivers still flowing and why is there water in our irrigation tanks? It's because of trees…when it's hot in the summer, everyone runs to stand under the shade of the tree. But at other times, nobody thinks of trees, not one person will support them"*

Intangible relationships	Bollandi (*Lagerstroemia macrocarpa*), mathi, aajinchekke (*Artocarpus hirsutus*), thandi Amme pann (*Psydrax dicoccus*) Paale pann (*Chrysophyllum roxburghii*) Kaad mange (wild mango; *Mangifera indica*)	*"Bollandi, I feel stood out, because they blossom around April, and just the tree trunk, the color of it and the way it peels…. actually these 5 – 6 trees that I told you, not all of them have fruits, but I feel like over time, I have developed a little relationship with them!"* *"Amme pann tree, it was there near my school. I used to sit there and collect the fruits and eat. I wonder whether that tree is there or it has died…"* *"(In) my childhood we had a very hard time...there was not enough to eat. There is no doubt at all if I say Nature has brought me up. Something was always in season to eat. Now is the time for Paale panne to fruit. Its sweet… full of gum…now we hardly get these kinds of trees. But I've kept one tree on my estate, it's fruiting this year."* *"Certain things related to trees and nature are more of a generational thing. When Mama and her brothers were young, they used to go and pick these kaad mange….the mangoes are fantastic from this tree, very sweet. My cousins and I also picked it when we were kids. And the tree's still there. Whenever we go in the summer, we still pick from it."*

Evolution of individuals' relationships with trees

Across interviews, respondents described the reduced use of some culturally important trees, alongside material substitutions and changes in sourcing practices. Others described developing personal attachments to trees over time (Table 2).

With respect to sourcing tree materials for festivals, 63% of respondents (n=14) had first-hand knowledge of the majority of the species used. Some respondents believed that ceremonial tree materials could not be substituted by other species, with two respondents explicitly stating that substitutions could not be made, and others stating that if the tree material was not available in the vicinity, they would look for it in neighbouring properties, or in the forest (n=5). However, some cases warranted substitution, such as the unavailability of bamboo after its flowering season (Table 2). Of the respondents who mentioned tying the Puthari *nere* annually (n=19), only one person mentioned using five species of leaves (n=1). Of those who explicitly named the leaves they used, the majority reported a combination of three or four leaves (n=7).

Four respondents live away from Kodagu, and three of them reported not celebrating traditional festivals anymore. The fourth continued to celebrate, but received ritual assemblages such as the nere either from family members in Kodagu or through the Kodava Samaj (a cultural and community centre for Kodavas) in her city.

In addition to the ritual significance of trees, respondents, largely from Kudiya and Kuruba communities, also described using native trees for NTFP collection, medicinal practices and construction, although less frequently than earlier. Although NTFP resources may still exist in the forest, they are not collected as regularly. Some respondents recollected personally using traditional medicines (n=6) to cure ailments like herpes, but noted a growing preference for hospitals and Western medicine.

Respondents reminisce using several traditional tree- and plant-based products that have lost their significance now. While constructing houses, wood from jackfruit and *bollandi* trees (*Lagerstroemia macrocarpa*) were used for doorframes, which are now commercially made from acacia and plywood. Other respondents shared similar accounts where trees and plants were used to make utilitarian products like the *koramba kode* (Fig. 6; kode=umberella), constructed from reed bamboo and *koovale* leaves (*Indianthus virgatus*). It was used to keep dry in the monsoon before being replaced by plastic raincoats.

This same shift toward market-oriented items over native ones is also visible in how traditional wild fruits are remembered and experienced across generations. Childhood, defined here as the period before age 12, emerged as a formative phase in shaping participants' present-day relationships with trees. Childhood memories of trees

coalesced around key themes such as play (n=7) and fruit gathering (n=18), alongside a strong sense of nostalgia (n=10) linked to landscape changes and the perceived disappearance of certain tree species. Participants (n=11) speak vividly of the shape and colour of the fruits, and commonly mention wild fruits including *nerale pann* (*Syzigum cumini*), *karmanji pann* (*Carissa sp.*), *paale pann* (*Chrysophyllum roxburghii*), and *koomathi pann* (*Dimocarpus longan*). Others who recalled picking fruits in childhood described consuming primarily cultivated varieties such as pink guava (*Psidium guajava*), chikoo (*Manilkara zapota*) and lychee (*Litchi chinensis*; n=8), typically grown in home gardens. Their exposure to wild fruit species seems limited, often mediated through stories and knowledge passed down by parents or grandparents rather than direct experience. This fraction of respondents comprises two groups of people — Kodavas aged below 50 (n=6), and Kodavas who spent their childhood away from Kodagu (n=2, aged 60–76).

Table 2 - Details of the contemporary substitution of trees and plants

Present significance	**Traditional tree species**	**Substitutes**	**Details from interviews**
Kaveri Shankaramana festival	Bamboo Woody creeper of botthe balli (*Gnetum ula*)	Hachinaru 'Paal balli'	One respondent used hachinaru posts instead of bamboo, which was unavailable after its monocarpic flowering event. In the absence of the botthe balli, paal balli creeper is fixed on the botthe
Death rituals	Mange (*Mangifera indica*)	Any species that is readily available	In areas where mango trees are unavailable - *"Earlier we used mango wood (in the funeral pyre). Now because we don't get it, we use any tree. Some people, to keep to custom, they'll put (at least) one piece of mango wood"*

Ritual offerings	Aajichekke leaf (*Artocarpus hirsutus*, Fig. 7)	Cup made of glass/steel etc.	Large leaves were rolled into a cup called 'challe', filled with alcohol/milk and placed as an offering to ancestors and Gods. It is now replaced by glass/steel cups
NTFP collection	Shrubs (paaicheepe, nattipai)	Synthetic broomstick	Availability of market alternatives have affected NTFP collection - *"In the hills, you get lots of plants which you can cut and make into a broom to sweep the house…but nobody goes to collect these things anymore. they think anyway you get everything in the town, the artificial ones, so why collect this?"*
Timber	Rosewood (*Dalbergia latifolia*)	Silver oak	Felling of exotic species like silver oak is not regulated and can be performed without permission - *"Now you're not allowed to use trees for timber…Only silver oak we sell, the merchants who buy it get the permits themselves."*

Construction	chekke, bollandi (*Lagerstroemia macrocarpa*);	Acacia, plywood	Predominantly used in construction of door frames in houses, now commercially available wood/plywood is preferred for construction
		Iron (metal)	Development of contemporary construction materials - *"Earlier they used to make houses from trees like Bollandi, before iron was used"*
	Noga (*Toona ciliata*)	Its use has reduced	Noga (yoke) is an agricultural implement used to harness two draft animals together. Noga is also the name of the tree the yoke is made from.
Utilitarian products	Bamboo	Plastic bottles	Hollow bamboo stumps were used to carry liquids.
	Bamboo and Koovale leaf (*Indianthus virgatus*; Fig. 6)	Plastic raincoat	Koramba kode, traditionally made rain cover, is now replaced by a plastic raincoat - *"Earlier, they used this vote (bamboo), and Koovale leaf to make a raincoat. Tie it all together and make an umbrella."*
	Banana (*Musa* sp.)	Plastic bags	Bags made of banana, now replaced by a plastic bag - *"Say you're cutting a pig in your house today, around 10 people would come, clean and take it back home… (To take it home) they used to make a bag by cutting the banana stump, peeling it and making a bag, with a handle and everything. It could carry up to 2kgs of meat easily."*

Intangible relationships	Native wild fruits - Karmaji pann (*Carissa* sp.) Native wild fruits	Exotic fruits - apples and grapes Exotic fruits - grapefruit, chikoo, lychee, Australian fig, dragon fruit, avocado	On the replacement of native fruits by exotic fruits - *"Earlier what fruits we had! Now does any child know those fruits like Karmanji? No. But they will know apples and grapes. The times have changed so much…"* *"Because as a community, we love experimenting…the grapefruit tree, chikoo, lychee, Australian fig behind. This is the soursop, banana, this is our favorite mango tree. Really good variety, Indo-American farm variety, and then we had that karmanji panne also behind that…So in Coorg, if you notice, none of them are really native, per se…we're the type of people who love fruits, but we've made way for the outside fruit. So much so, we have dragon fruit, and avocado of course. So we have all the fruits for us, but how many of them are native to this area?'*

Fig. 6 - Koramba kode, constructed from reed bamboo and koovale leaves, used to keep dry during the monsoon season (Photo - Raagini Muddaiah) ▲

Fig. 7 - Challe, made by rolling large leaves of aajinchekke, filled with offerings of milk/alcohol ▶

Motivations influencing the evolution of peoples' relationships with trees

Respondents' accounts reveal a relationship with trees that has been in constant flux, continually shaped by socio-cultural values, market substitutions, gradual loss of traditional knowledge, and evolving access to tree resources.

Certain rituals and ceremonies have undergone substitutions driven by the unavailability of traditional tree materials. For instance, in constructing ritual structures like the Kaveri Shankramana botthe and Puthari nere, respondents reported being unable to identify and locate the required species (n=7). Others noticed the absence of these species from their immediate surroundings, necessitating sourcing from neighbouring areas. Consequently, they (n=4) resorted to obtaining prepared materials through estate workers or community institutions like the Kodava Samaj, rather than collecting and preparing it themselves. In contrast, two participants (from the Kuruba and Kudiya community) described personally collecting, constructing and distributing these ritual structures to others. Similarly, death rituals where cremations are traditionally conducted with mango wood have undergone a transformation, necessitated by the decreased availability of mango trees.

While ceremonial substitutions were often caused by the disappearance or reduced availability of specific tree materials, the decline in collection and use of NTFPs was explained by a different set of reasons. Respondents explained that although the trees themselves may be present in the landscape, they were not utilised anymore. They attributed this shift to several factors - the availability of market alternatives which reduced the practical significance of locally sourced forest products such as bamboo (n=4); increased work commitments which left little time for collecting forest produce (n=2); and legal and regulatory changes that affected access to forest resources (n=2).

The availability of market alternatives was also reported to have transformed traditional tree-based practices associated with utilitarian objects, including bags made from banana leaves, and makeshift water containers and rain covers made from bamboo (n=5). As commercially available substitutes became more accessible, many of these traditions were perceived as less necessary.

Respondents reported that changes in regulations governing forest access affected traditional medicinal practices, and hence limited opportunities to engage with tree-based resources (n=2). Although traditional medicines remain in use, respondents described a gradual shift towards Western medicine and hospital-based care, reducing reliance on tree-based traditional remedies.

Respondents described a similar shift in the use of timber from subsistence purposes like

constructing houses, and making furniture and agricultural implements to timber sale on a commercial scale. Some respondents attributed this transition to colonial rule, describing how British presence contributed to timber commercialisation. Currently, legal restrictions on the felling of native trees have reshaped timber-use practices, with a majority of the respondents reporting that the sale of silver oak is the only form of timber extraction they participate in (n=9).

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DISCUSSION

Much of the existing literature from Kodagu has focused on the history (Ambinakudige & Choi, 2009), ecology, and conservation potential of coffee agroforests (Garcia, 2010; Nath et al., 2011) and sacred groves (Kalam, 1996; Kushalappa & Raghavendra, 2012), documenting what these landscapes contain and how they have changed, rather than why people's relationships with trees within them are changing. Our study addresses this latter question in the present context of Kodagu. The findings presented here trace a relationship between people and trees that is neither static nor uniformly declining, but is continuously configured by changing access to resources, market regulation and individual biography.

Regardless of community and place of residence, most participants celebrated the festivals of Kaveri Shankaramana and Puthari. Across festivals and rituals in Kodagu, transformations appear to occur as a means to enable their continuation. For instance, to construct the Kaveri Shankramana botthe, bamboo is replaced by 'puthari mara' during a naturally occurring bamboo die-off event; mango is replaced by any available wood during cremations; the 'botthe balli', in its absence, is replaced by the 'paal balli'. Such adaptation to ensure ritual continuity is not a new phenomenon in Kodagu. On what he noticed of the culture and tradition of Kodagu in 1922, Nadikerianda Chinnappa, who compiled the book Paṭṭōlé Paḷamé (Chinnappa, 2003) writes : *"I realised, on a detailed study, that the customs had changed over time and that they varied from place to place, either because the original practices had been forgotten or because they were interpreted differently."* This highlights that rather than being solely a contemporary phenomenon, transformation and adaptation have formed part of cultural practice in Kodagu for more than a century. The book Paṭṭōlé Paḷamé remains the most exhaustive record of Kodava culture and tradition - a text many Kodavas turn to when a ritual detail or custom is in doubt. This kind of adaptation, substitution as a means of preserving rituals, rather than abandoning it, is not unique to Kodagu. Candomblé practitioners in New York City, for instance, substituted unavailable Brazilian liturgical plants with locally available species, allowing their rituals to persist despite relocation (Fonseca & Balick, 2018). Although the drivers of substitution differ - ecological scarcity in our study, geographic relocation in theirs, both communities treat substitution as an alternative to abandonment.

Further evidence of ritual practices persisting through adaptation lies in how Kodavas living in cities modify practices to fit contexts where traditional materials are not readily available. This strategy is mirrored among migrant communities elsewhere, who sustain access to home-country materials by importing them through family members back home, rather than abandoning traditional practice (Fontefrancesco et al., 2019). Additionally, Kodavas in cities also rely on community institutions like the Kodava Samaj to supply ready-made ritual assemblages.

Yet, sourcing the right materials is only one part of what sustains a practice; retaining the meaning behind them is another, and this appears less consistently preserved in Kodagu. Paṭṭōlé Paḷamé (Chinnappa, 2003) records ecological meanings associated with some traditional practices which were not discussed often during our interviews. For example, during Kaveri Shankaramana, the botthe is introduced into the paddy field when the grain is ripening. In the otherwise open and flat paddy landscape, where trees are absent and birds have few places to perch, the botthe provides a vantage point for birds to prey on rodents, performing the function of an artificial bird perch. Such structures are increasingly recognised within agricultural science literature as a form of integrated pest management (Gunathilagaraj, 1996; Tohiran et al., 2024; Beltramo & Goudet, 2025). The botthe, functioning simultaneously as a ritual structure and a bird perch, continues to represent a practice through which trees retain both cultural significance and ecological value. However, only a few people attached meaning to the Shankramana botthe, while no such meanings were attached to the Puthari nere, suggesting that cultural practices may persist even as the ecological knowledge associated with them becomes less widely retained. Similar patterns have been observed among the Malay community in Sintang, Indonesia, where several traditional ritual practices continue to use a diversity of plant species, despite a significant decline in species-level knowledge and meanings embedded within them (Suwardi et al., 2025).

Unlike seasonal festivals such as Kaveri Shankaramana and Puthari, paal mara (translating to 'milk tree'), function as permanent sites of ritual activity. They are revered year-round for their milky latex which is interpreted as a sign of life. Similar associations between sacred meaning and latex-producing trees are documented elsewhere, including Ecuador's Pinkul Tayta tree (Magdaleno, 2020) and Southern Ethiopia's Qilxaa tree (Roba, 2025). The white sap of the Qilxaa tree symbolises abundant livestock milk to the agropastoral Guji society, though deforestation and agricultural encroachment are eroding these beliefs (Roba, 2025). Similarly, reverence for paal mara in Kodagu is uneven: while some respect the tree, others see it as an obstacle to development, with infrastructure increasingly contesting its once-protected, sacred status.

Together, these patterns suggest a layered process of transformation: material adaptation sustains ritual continuity; ecological knowledge associated with rituals fade even as the ritual persists; and for some trees, sacred status itself becomes contested.

Although trees remain important across communities due to their ritual significance, this study identified certain community-specific drivers that shape human-tree relationships in Kodagu. For the Kurubas, contemporary relationships with trees appear to be shaped largely by conservation-driven restrictions on access to forest resources. Their relationships with forest produce are shaped by complex histories of displacement which began in the 1970s, where families residing within what is now protected area, were progressively relocated to its periphery (Gupta, 2020). The Kurubas still retain legal rights

to collect forest produce, but the fear of persecution often discourages them from exercising these rights freely. The most tangible expression of this disruption in the current dataset is the declining use of tree-based medicine. Although Kurubas continue to use traditional medicines occasionally, they prefer going to the hospital. Relocation has altered access to medicinal trees, disrupting the close and routine interactions through which medicinal knowledge was practiced and maintained (Gupta, 2021). Combined with greater access to hospitals and Western medicine, this decline may reflect processes extending beyond displacement alone. Kurubas may also be moving away from tree-based medicine because they no longer perceive it as the most effective way to address their healthcare needs - a pattern observed among other displaced or transitioning communities globally (Reyes-García et al., 2013).

Although the Kurubas are well researched on their conservation-driven displacement and socio-economic marginalization (Mahanty, 2003; Tejaswi, 2008; Gupta, 2020, 2021), very little literature exists on the Kudiyas of Kodagu. The Kudiya community are marginal landholders living adjacent to Reserve Forests, and forest resources remain physically accessible to them. Yet NTFP collection, once integrated into everyday practice (Shrinidhi & Somanna, 2018), has declined. This decline is not prompted by loss of access, but from broad shifts in livelihoods, since the popularity of market alternatives has reduced the significance of NTFPs. In addition, as also described in an earlier study (Arathi & Gurulingiah, 2024), many described participation in formal employment and wage labour, leaving less time to spend in forests and engage in practices of collection. This mirrors a broader trend among forest-dependent tribal communities in India, such as in Kerala's Wayanad district (Abhishek & Parayil, 2024) and Odisha's Similipal Tiger Reserve (Dash et al., 2016), where access to alternative employment has reduced reliance on NTFP collection.

While the Kurubas' relationship with trees is mediated by access to forested land, and the Kudiyas' by market alternatives, the Kodavas' relationship is mediated by land ownership itself, and the economic value it allows trees to accrue. Before British rule, trees on Kodava-owned land were managed primarily as household resources for construction, furniture, and implements, rather than commercial commodities. Colonial administration in the mid-1800s shifted this logic toward commercial timber extraction (Gadgil & Guha, 1993). This shift ran alongside a parallel transformation of the landscape itself, where the colonial period saw the commercialisation of coffee. In the 1970s and 80s, Indian coffee production rose from 68,948 to 120,000 tonnes within a decade (Coffee Board, 2026), and Kodagu, one of India's major coffee-producing regions, accounted for much of this growth. In Kodagu, this expansion was driven largely by the conversion of native forest into coffee plantations across the district (Ambinakudige & Choi, 2009). Both transformations - of tree use and of land use - persist today in the continued preference for exotic silver oak and avocado within this post-colonial plantation landscape, reinforced by Kodagu's land tenure regulations.

Of the two main tenure systems, 'redeemed land' grants landowners felling rights, although the felling, sale, and transport remain subject to strict permission procedures. Under 'unredeemed land,' tree felling rights remain with the Government despite private ownership of the land (Nath, 2010; Shruthy, 2019). Because exotic species like silver oak are unregulated under both systems, they are now widely preferred for planting and retention over native trees (Nath, 2010; Juarez et al., 2025).

A similar temporal shift is visible not just in timber, but also in the types of fruits respondents spoke of. Younger Kodavas' exposure to wild fruit species is limited, mediated through intergenerational stories rather than direct experience. This shift coincides with the spread of hybrid fruit cultivation in India from the early twentieth century, accelerated by the Green Revolution (Dhiman et al., 2010) and by firms such as Indo-American Hybrid Seeds, founded in 1965, which made locally adapted hybrid produce widely accessible (INDAM, 2024).

Beyond the ritual, medicinal, and material relationships discussed above, Kodavas also described intangible, personal attachments to specific trees, formed through familiarity rather than use. Human-tree relationships across emotional dimensions are a growing area of study. In the Netherlands, a study of favourite trees identified three distinct types of human-arboreal relationships, offering nostalgic, nurturing, and empowering possibilities for connection (Vainio et al., 2025). Similarly, through this study, we found that some trees are retained or planted for their association with nostalgia, rather than for any ritual or economic role. Kaad mange (*Mangifera indica*) and paale pann (*Chrysophyllum roxburghii*) are appreciated for their significance in family routines and childhood experiences, while others described developing an attachment over years of observing a tree's seasonal blossoming or bark, or recalled childhood fruit trees they no longer know the fate of (Table 1). These accounts reflect broader findings that meaningful human–nature relationships emerge through recurring interactions and become embedded in memory and attachment over time (Beery & Lekies, 2021). Unlike the ritual, medicinal, and economic relationships discussed earlier, each shaped by specific, identifiable drivers of change, these intangible attachments persist on their own terms, independent of practical or ceremonial function, and offer a quiet reminder that not every relationship between people and trees needs a reason to endure.

CONCLUSION

Communities in Kodagu continually adapt their relationships with native trees to maintain identity. This process is shaped by distinct, community-specific drivers - displacement and restricted access for the Kurubas, market integration and wage labour for the Kudiyas, and colonial-rooted commercialisation for the Kodavas - even as ritual practice itself largely persists. Notably, this persistence often outpaces the ecological knowledge associated with it, suggesting that the survival of a tradition is not a reliable indicator of the survival of its meaning. These findings carry implications for management of native trees in Kodagu's agroforest landscapes. Interventions that rely on a single strategy, whether it is raising awareness or incentivising native trees, are likely to address only part of the problem since the underlying drivers differ by community. Effective management may instead require place-based, community-specific interventions that could begin with the preservation of native tree species essential to rituals and festivals.

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LIMITATIONS

This study is subject to certain limitations which should be considered when interpreting the findings. The sample size (n=22) and snowball sampling method of recruiting participants may have introduced selection bias. Respondents were likely more accessible to the researcher, or more willing to discuss tree-related practices, limiting the overall diversity of perspectives captured within each community. Representation across communities was uneven, reflecting differences in population size and accessibility within Kodagu. Since this study is focused on a single landscape (Kodagu) and a limited set of communities within it, the extent to which the patterns identified here generalise to other regions or communities remains open for future research.

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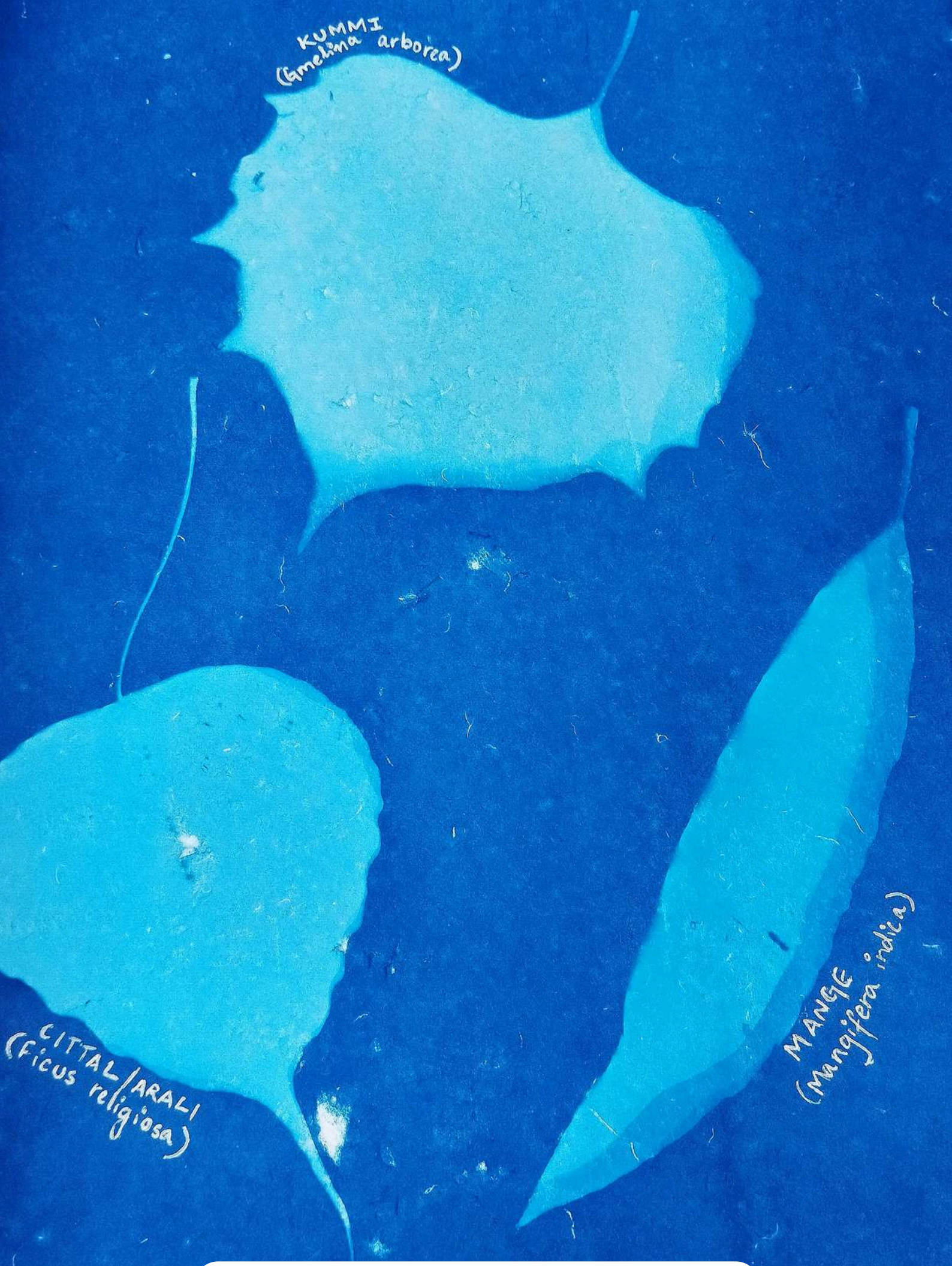
Pepe Shatsang



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