# Plant Diversity and Traditional Knowledge: An Ethnobotanical Documentation from Thanthai Hans Roever College (A), Perambalur, Tamil Nadu

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***Abstract*—Ethnomedicinal plants have long formed the backbone of indigenous healthcare systems, providing effective and accessible alternatives to conventional medicine. The Perambalur district of Tamil Nadu, renowned for its biodiversity, remains relatively under-documented in terms of its medicinal plant resources. This study sought to identify and document ethnomedicinal plant species within the campus of Thanthai Hans Roever College and to assess their cultural and therapeutic relevance. Field surveys, complemented by interviews with local informants including traditional healers and elderly community members resulted in the identification of 56 species belonging to 33 botanical families. Herbs constituted the majority of recorded species (67.86%), commonly used to manage conditions such as fever, digestive disorders, respiratory ailments, and skin diseases. Plant parts such as leaves, roots, stems, and seeds were frequently utilized in forms such as pastes, juices, and decoctions. The application of quantitative ethnobotanical indices Use Value (UV), Relative Frequency of Citation (RFC), Informant Consensus Factor (ICF), and Relative Importance (RI) revealed the prominence of species like *Azadirachta indica*, *Cissus quadrangularis*, and *Argemone mexicana*. High ICF values reflected strong consensus among informants regarding their therapeutic efficacy. This study underscores the ecological and ethnobotanical importance of campus flora and advocates for their conservation and scientific validation to enhance sustainable primary healthcare strategies.**

***Index Terms*—Ethnobotany, Medicinal plants, Indigenous medicine, Plant-based remedies, Traditional knowledge.**

## I. INTRODUCTION

The use of ethnomedicinal plants has long been a cornerstone of traditional healthcare systems, particularly in rural and indigenous communities where access to formal medical services remains limited. These natural remedies have historically played a critical role in treating a wide range of ailments from minor infections to chronic illnessesusing various plant parts such as leaves, roots, stems, and flowers. Transmitted orally across generations, this body of traditional knowledge constitutes a vital part of cultural identity and intangible biocultural heritage. In ecologically

diverse and resource-constrained regions, ethnomedicine continues to serve as a practical, affordable, and ecologically sustainable alternative to modern pharmaceuticals[1].

India, known for its rich biodiversity and ancient healing traditions, holds a vast reservoir of ethnobotanical wisdom deeply embedded in its cultural fabric. Spanning numerous agro-climatic zones, India has been the focus of extensive ethnobotanical surveys documenting the medicinal applications of indigenous flora for conditions such as fevers, gastrointestinal disorders, dermatological issues, and respiratory diseases[2]. These studies not only capture traditional practices but also serve as a foundation for scientific validation and pharmaceutical innovation. The systematic documentation of ethnomedicinal practices is critical not only for preserving this valuable knowledge but also for supporting drug discovery, especially in light of the growing concern over antibiotic resistance, the side effects of synthetic drugs, and the rising demand for integrative and natural therapies. For instance, *Coccinia indica* leaf extract has demonstrated hepatoprotective activity against ACE inhibitor-induced toxicity in preclinical models, illustrating how traditional formulations can inform modern biomedical interventions[3]. Similarly, recent studies have reaffirmed the effectiveness of Indian traditional medicine in managing venomous snakebites, emphasizing its relevance in developing community-based public health strategies[4].

The present investigation aims to enrich the existing ethnobotanical records by cataloging medicinal plant species located on the campus of Thanthai Hans Roever College, with emphasis on therapeutic uses, preparation methods, and modes of administration. It also highlights the urgent need for biodiversity conservation and calls for sustainable management of these plant resources, many of which are at risk due to habitat loss, anthropogenic pressure, and unsustainable harvesting.

## II. MATERIAL AND METHODS

### Study Area and Plant Authentication

The present study was carried out on the campus of Thanthai Hans Roever College (THRC), located in Perambalur District, Tamil Nadu, a region characterized by a semi-arid climate and ecological diversity. This unique combination of climatic conditions and native vegetation provides a conducive environment for the growth and documentation of ethnomedicinal plant species traditionally utilized by the local communities for various health-related purposes. The identification and authentication of collected plant specimens were performed at the Rabinat Herbarium, St. Joseph's College (Autonomous), Tiruchirappalli, Tamil Nadu, India, ensuring taxonomic accuracy and scientific validity.

### Plant Selection and Documentation

The selection of ethnomedicinal plants was informed by traditional knowledge shared by local healers, farmers, and elders from nearby villages. Data on therapeutic uses, preparation methods, and plant parts employed were collected through structured interviews and informal discussions, offering deep insight into local healthcare practices. Guided by this information, field surveys were conducted to locate and collect the identified plant species. Each specimen underwent systematic taxonomic classification using standard botanical keys and was verified through authoritative literature. A total of 56 medicinal plant species across 33 botanical families were recorded. Scientific names and family classifications were validated with the assistance of botanical experts and cross-referenced with herbarium records to ensure taxonomic accuracy and documentation reliability.

### Data Collection

Data collection was carried out through systematic field surveys across the Thanthai Hans Roever College (THRC) campus, focusing on the in-situ observation and documentation of medicinal plant species within their natural habitats. During these visits, photographic records were compiled to establish a visual reference archive, while herbarium specimens were collected and preserved for taxonomic verification and future research use. For each identified species, detailed ethnobotanical information was meticulously recorded, including growth habit, vernacular name, utilized plant parts, methods of preparation, routes of administration, and associated therapeutic uses. The most frequently used plant parts included leaves, roots, stems, flowers,

fruits, seeds, and bark. Preparation techniques encompassed pastes, juices, decoctions, infusions, and powders, tailored to the specific ailment and shaped by generational knowledge transfer. Remedies were administered orally, topically, or through combined approaches, reflecting the integrative and holistic nature of traditional medical systems practiced in the region.

Ethnobotanical Interviews

In-depth, semi-structured interviews were conducted with traditional healers and knowledgeable community members possessing firsthand experience with indigenous medicinal practices. The interviews employed open-ended questions, which encouraged detailed and flexible responses, enabling participants to share their knowledge of plant species, describe therapeutic applications, and elaborate on preparation methods (Table 1). All interviews were carried out in the local language, Tamil, to ensure cultural relevance, clarity, and trust-building between the researchers and informants. The responses were subsequently translated into English, carefully documented, and systematically analyzed to extract ethnobotanical insights. This approach ensured the preservation of nuanced cultural knowledge and helped establish the therapeutic credibility of the documented plant uses. Recent ethnobotanical research has emphasized the value of local languages and flexible qualitative techniques in capturing traditional medicinal knowledge with high fidelity [5].

Traditional Preparation Methods of Medicinal Plants

The local community employs diverse traditional methods to enhance the efficacy of medicinal plants, with preparation techniques tailored to specific plant parts and therapeutic needs. Pastes made by grinding fresh or dried leaves, roots, or stems are primarily used topically for skin conditions and occasionally taken orally. Juices, extracted from crushed leaves or fruits, serve both internal and external purposes, including treatment of infections and inflammation. Decoctions, prepared by boiling roots, bark, or entire herbs, are commonly consumed or used for cleansing wounds. Infusions, created by steeping soft tissues like flowers or tender leaves, are typically used for fevers, colds, and digestive issues. Powders, derived from dried seeds, bark, or rhizomes, are administered orally with carriers such as water or honey, or applied externally. These preparation methods reflect deep-rooted empirical knowledge and highlight the pharmacological potential of traditional practices [6].

## III. DATA ANALYSIS

Relative Frequency of Citation (RFC)

The Relative Frequency of Citation (RFC) was employed to assess the local importance and consensus among informants regarding the ethnomedicinal use of specific plant species. This quantitative ethnobotanical index helps determine the cultural relevance of each species by reflecting how frequently it is cited across all interviews [7]. RFC was calculated using the formula

$$RFC = FC/N \ (0 < RFC < 1)$$

RFC, calculated as the ratio of informants citing a plant (FC) to the total surveyed (N), ranges from 0 to 1, reflecting its local ethnomedicinal relevance and aiding in prioritizing culturally important species for further study.

Use value (UV)

The Use Value (UV) is a quantitative ethnobotanical index that measures the relative importance of plant species based on the diversity of uses reported by local informants. It is calculated using the formula.

$$UV = \sum U / n$$

In ethnobotanical research, the Use Value (UV) is a quantitative index that measures the relative importance of each plant species based on the number of use-reports it receives. Specifically, U denotes the total number of use-reports cited by all informants for a given species, while n represents the number of informants who mentioned that species. A higher UV indicates that a plant has a wider range of ethnomedicinal applications and holds greater cultural and therapeutic relevance within the community. This index is frequently employed to identify culturally significant species that warrant further phytochemical and pharmacological investigation [8].

Relative Importance (Ri)

The Relative Importance (RI) index is a valuable ethnobotanical tool that assesses the significance of a

plant species based on two main factors: the number of distinct medicinal uses attributed to it and the diversity of body systems it is employed to treat. This index highlights the therapeutic versatility of a species and aids in identifying plants with broad-spectrum ethnomedicinal relevance. RI is calculated using the formula.

$$RI = [(Rel\ PH + Rel\ BS) \times 100] / 2$$

where NP is the number of pharmacological properties attributed to a species, NPmax is the maximum number of properties recorded for any species in the dataset, NBS is the number of body systems a species is used to treat, and NBSmax is the maximum number of body systems treated by any species. A higher RI score indicates a species of greater medicinal importance and potential for pharmacological exploration [9,10].

Informant consensus factor (ICF)

The Informant Consensus Factor (ICF) is a widely used quantitative index in ethnobotany that evaluates the level of agreement among informants on the use of plant species for specific ailment categories. It indicates how consistently particular plants are cited for treating defined health conditions, thereby highlighting culturally significant and potentially effective species. The ICF is calculated using the formula.

$$ICF = (Nur - Nt) / (Nur - 1)$$

where *Nur* is the number of use-reports in a particular ailment category, and *Nt* is the number of taxa (plant species) used for that category. ICF values range from 0 to 1, with higher values signifying a greater degree of consensus and potentially more effective ethnomedicinal applications [11,12].

The collected ethnobotanical data were systematically analyzed to classify plant species and families according to their medicinal applications and commonly employed preparation methods. Frequency distribution analysis was conducted to determine the most frequently used plant parts and their corresponding therapeutic uses. Furthermore, the documented ethnomedicinal plants were categorized based on their reported pharmacological activities, including anti-inflammatory, antipyretic, antimicrobial, digestive, and other health-promoting effects, providing insights into their potential therapeutic relevance.

Ethical Considerations

This study was conducted in strict accordance with ethical research standards, ensuring the rights, dignity, and welfare of all participants. Informed consent was obtained from each informant after clearly explaining the study's objectives. Personal data and shared knowledge were treated with strict confidentiality. Plant specimen collection was carried out responsibly, adhering to local environmental guidelines and avoiding harm to endangered or protected species. Traditional knowledge was documented with cultural sensitivity, and appropriate acknowledgment was given to honor and uphold the intellectual property rights of the community.

## IV. RESULTS

Ethnomedicinal Plant Diversity and Traditional Healing at THRC Campus

A total of 56 ethnomedicinal plant species belonging to 33 botanical families were documented from the Thanthai Hans Roever College (THRC) campus in Perambalur District, Tamil Nadu. These species, comprising herbs, shrubs, climbers, and trees, are traditionally utilized by local healers to address a wide range of health conditions. Leaves, roots, stems, seeds, and bark were the most frequently used plant parts, often prepared as pastes, juices, decoctions, or powders and administered either orally or topically. Frequently cited species included *Abrus precatorius*, *Acalypha indica*, and *Aerva lanata*, valued for their efficacy in treating jaundice, asthma, fever, skin disorders, and gastrointestinal ailments. Remedies such as leaf juices, root pastes, and stem decoctions were commonly employed. Plants like *Aloe vera* and *Azadirachta indica* exhibited multiple therapeutic applications, underscoring the depth of traditional knowledge preserved within the local community. This study underscores the crucial role of ethnomedicinal plants in rural primary healthcare and emphasizes the need for their conservation and scientific validation.

Ailments and Quantitative Ethnobotanical Indices

Community informants demonstrated a high degree of consistency in the use of ethnomedicinal plants to

treat a broad spectrum of health conditions. Among these, gastrointestinal disorders exhibited the greatest diversity of plant use, with nine species generating 142 use-reports and yielding an Informant Consensus Factor (ICF) of 0.94. This high ICF reflects strong communal agreement and reliance on traditional remedies for conditions such as dyspepsia, diarrhea, jaundice, and hemorrhoids. Respiratory ailments were addressed using five species, resulting in 90 citations and an ICF of 0.96 an even higher consensus, particularly centered around the efficacy of *Acalypha indica* and *Achyranthes aspera*. Dermatological conditions were treated with twelve species across 75 use-reports (ICF = 0.85), indicating moderate agreement and variability in the selection of plants for treating wounds, burns, and ringworm. Fever-related illnesses, including those resembling malaria, were managed with only three species but accumulated 60 citations, resulting in a notably high ICF of 0.97. This points to strong communal confidence in the antipyretic properties of *Argemone mexicana* and *Azadirachta indica*. Musculoskeletal issues were addressed using six taxa across 40 use-reports (ICF = 0.87), with consistent use of poultices derived from *Cissus quadrangularis* and *Blepharis maderaspatensis* for managing fractures, joint pain, and tetanus.

The Use Value (UV) analysis provides a quantitative measure of the relative importance of medicinal plants within traditional healthcare systems by dividing the total number of citations for a species by the number of informants who mentioned it. This index highlights species most valued in local healing practices. For example, *Azadirachta indica* was cited 75 times by 50 informants, yielding a UV of 1.50, reflecting its broad therapeutic use in treating skin disorders and febrile illnesses. In contrast, *Boerhavia diffusa* recorded a UV of 0.80, suggesting more specialized applications, particularly for its diuretic and laxative effects. Species with UVs above 1.00 such as *Cissus quadrangularis* (UV ≈ 1.20) and *Argemone mexicana* (UV ≈ 1.10) are notably important in the treatment of bone fractures and malaria-like fevers, respectively. Conversely, plants with UVs below 0.50 tend to have limited or condition-specific usage. This analysis not only identifies culturally significant medicinal plants but also provides a foundation for selecting priority species for pharmacological research and conservation strategies.

The Relative Frequency of Citation (RFC) is a key ethnobotanical index that reflects how widely each medicinal plant is recognized within a community. It is calculated by dividing the number of informants who mention a particular species by the total number of participants in the study. For instance, if *Azadirachta indica* is cited by 30 out of 50 informants, its RFC would be 0.60, indicating broad recognition and perceived therapeutic relevance. Species with RFC values above 0.50 such as *Cissus quadrangularis* (RFC ≈ 0.58), commonly used for bone-related ailments, and *Argemone mexicana* (RFC ≈ 0.62), employed in the treatment of fevers are typically regarded as culturally significant and widely accepted within traditional healing practices. Conversely, plants with lower RFC values (below 0.30) are less frequently mentioned, which may suggest specialized uses or limited regional knowledge. As a simple yet powerful metric, RFC helps identify the most prominent medicinal species, guiding efforts in ethnopharmacological research, biodiversity conservation, and community-based healthcare planning.

Relative Importance Index (RI) index provides a comprehensive measure of a plant species' medicinal versatility by integrating two key dimensions: the diversity of ailments it is used to treat and the range of physiological systems it affects. RI is computed by averaging two normalized values (i) the proportion of therapeutic categories in which a plant is used, and (ii) the proportion of body systems it treats each relative to the maximum recorded for any species in the study. For instance, *Azadirachta indica* demonstrates a high RI value (~0.82), reflecting its broad application across gastrointestinal, dermatological, febrile, and respiratory conditions. In contrast, *Cissus quadrangularis*, mainly utilized for musculoskeletal disorders, records a lower RI (~0.64) due to its more targeted use. The RI index is particularly valuable for identifying culturally significant species with broad-spectrum therapeutic relevance, thereby supporting the prioritization of these plants for detailed pharmacological investigations and conservation initiatives.

High ICF values High informant consensus values indicate strong cultural agreement regarding a plant's medicinal efficacy, underscoring its well-established role in traditional healing systems. Such plants are prime candidates for pharmacological investigations aimed at isolating bioactive compounds with potential therapeutic applications. Their widespread use and cultural significance further emphasize the need for their conservation not only to protect biological diversity but also to preserve the indigenous knowledge systems that have guided their use across generations. Safeguarding these species ensures the continuity of ethnomedical heritage while supporting efforts in sustainable drug discovery and community-based healthcare.

## V. THE TABLE WITH THE NUMBER OF SPECIES AND THEIR PERCENTAGE FOR EACH UNIQUE PLANT FAMILY

A total of 56 ethnomedicinal plant species belonging to 33 botanical families were documented from the campus of Thanthai Hans Roever College, Perambalur District. The family Euphorbiaceae was the most dominant, representing 12.5% of the total flora with seven species. This was followed by Fabaceae with five species (8.93%) and Caesalpiniaceae with four species (7.14%). Other frequently represented families included Malvaceae (5.36%), while Nyctaginaceae, Cucurbitaceae, Lamiaceae, and Rutaceae each contributed two species (3.57%). Numerous families such as Acanthaceae, Amaranthaceae, Apocynaceae, Crassulaceae, Araceae, Asclepiadaceae, Sapindaceae, Poaceae, Vitaceae, Capparaceae, Menispermaceae, Commelinaceae, Convolvulaceae, Moraceae, Verbenaceae, Mimosaceae, Moringaceae, Nymphaeaceae, Passifloraceae, and Cactaceae were each represented by a single species, accounting for approximately 1.79% per family (see Fig. 1). This high taxonomic diversity underscores the richness of traditional ethnomedicinal knowledge in the region and highlights the broad taxonomic base of plants utilized in local healthcare practices.

## VI. ANALYSIS OF HABIT WITH RESPECT TO NUMBER OF SPECIES

An analysis of the growth habits of the recorded ethnomedicinal species revealed that herbs were predominant, comprising 67.86% of the total flora. Shrubs accounted for 17.86%, followed by trees (10.71%) and climbers (3.57%) (Fig. 2). The dominance of herbs suggests a traditional preference for easily accessible, fast-growing plant resources frequently used in local healing practices. However, the presence of shrubs, trees, and climbers alongside herbs reflects the ecological diversity of the Thanthai Hans Roever College (THRC) campus. This botanical heterogeneity underscores the ecological and cultural importance of conserving medicinal plant resources, which play a vital role in sustaining both biodiversity and indigenous knowledge systems. It also highlights the value of such ecosystems for future ethnopharmacological research and community-based healthcare resilience.

## VII. LIFE FORM AND PARTS USED

Among the 56 ethnomedicinal plant species recorded, herbs emerged as the predominant growth form, representing 48.21% of the total flora. Shrubs and trees were equally represented, each comprising 14.29% of the species, while climbers including both twining and erect forms accounted for 12.50%. Aquatic herbs were the least represented, contributing only 1.79% to the overall plant diversity (Fig. 3). This distribution underscores the dominance of herbaceous species in the traditional medicinal practices of the region, reflecting a community preference for readily available, fast-growing plants that are particularly suited for immediate and practical therapeutic application.

## VIII. METHOD OF PREPARATION AND MODE OF ADMINISTRATION OF PLANTS

The preparation and administration methods of ethnomedicinal plants are intricately connected to the specific plant parts used and the nature of the health condition being addressed. Leaves are most commonly utilized and are typically processed by crushing or extracting juice. Roots, stems, and bark are often dried, boiled, or ground into decoctions, powders, or pastes. For instance, the leaves of *Acalypha indica* are frequently administered as fresh juice, while *Achyranthes aspera* is prepared as a paste for topical use. *Moringa oleifera* is widely used in decoction form, particularly for managing

hypertension. Similarly, *Aloe vera* and *Cassia angustifolia* are commonly used as powders or infusions. The method of administration depends on the intended treatment ranging from oral intake via juices, decoctions, and infusions to external application of pastes or extracts. In traditional practices, these herbal preparations are often combined with natural carriers such as honey, milk, or oil to improve efficacy, enhance taste, or minimize adverse effects. This reflects the nuanced and holistic nature of indigenous healthcare systems.

## IX. INGREDIENTS ADDED

The preparation of ethnomedicinal remedies frequently involves the use of supplementary ingredients intended to enhance therapeutic efficacy, improve palatability, or facilitate absorption. Commonly employed additives include water, milk, honey, lemon juice, oil, and other natural substances each selected for a specific functional purpose within traditional formulations. For instance, the juice of *Acalypha indica* is often diluted with water to potentiate its emetic effect, while *Aloe vera* is traditionally combined with turmeric to treat skin eruptions. In managing malarial fever, the leaf extract of *Argemone mexicana* is typically administered with cow's milk to augment its medicinal potency. Likewise, a paste of *Boerhavia diffusa* is consumed with honey, which not only aids ingestion but also enhances its digestive and diuretic properties. Lemon juice is frequently mixed with powdered preparations, such as those from *Butea monosperma*, particularly in treating dermatological conditions like Dhobi's itch. For topical applications especially in the management of bone fractures or skin ailments coconut oil, black gram flour, and egg yolk are used to improve consistency and therapeutic impact. These practices reflect the empirical sophistication of indigenous healthcare systems and illustrate the integrative, holistic approach characteristic of traditional medicine.

## X. DISCUSSION

The identification and documentation of 56 ethnomedicinal plant species spanning 33 botanical families at the Thanthai Hans Roever College (THRC) campus highlight the region's substantial ethnobotanical heritage. These plants are routinely utilized by local healers to manage a wide range of health conditions, including jaundice, asthma, fever, digestive disorders, and dermatological issues. This aligns with previous studies emphasizing the importance of native flora in supporting traditional healthcare systems and safeguarding community-based medicinal knowledge [13]. The continued reliance on such plant-based remedies not only reflects the resilience of indigenous knowledge systems but also reinforces their potential contributions to pharmacological discovery and public health initiatives. Traditional remedies often emphasize the use of specific plant parts such as leaves, roots, stems, seeds, and bark, each serving distinct therapeutic roles in indigenous healthcare systems. Among these, Aloe vera and Azadirachta indica stand out due to their potent antimicrobial, anti-inflammatory, and wound-healing properties, which have led to their widespread use in treating infections, skin disorders, and inflammatory conditions. Their consistent presence across diverse traditional medicinal systems underscores their pharmacological relevance and the empirical wisdom embedded in local healing practices [14].

The study highlights the reliance on simple and resource-efficient methods of herbal remedy preparation such as pastes, juices, decoctions, and powders which are particularly compatible with rural healthcare contexts where accessibility, affordability, and ease of preparation are vital [15,16]. This underscores the deep-rooted integration of traditional knowledge systems into community health practices. Moreover, the research calls attention to the critical need for the conservation of these medicinal plant resources and the importance of their scientific validation. Ethnobotanical literature consistently emphasizes that preserving indigenous medicinal knowledge not only supports cultural continuity but also offers a foundation for novel drug discovery[17]. However, many of these valuable plant species are increasingly threatened by habitat loss and unsustainable harvesting. Their protection is essential, both to safeguard traditional healing wisdom and to explore their potential contributions to modern pharmacological development.

A comprehensive ethnobotanical survey conducted at Thanthai Hans Roever College (THRC) in Perambalur documented 56 ethnomedicinal plant

species distributed across 33 botanical families. The Euphorbiaceae family emerged as the most dominant, contributing 12.5% of the total flora (7 species), followed by Fabaceae (8.93%, 5 species) and Caesalpiniaceae (7.14%, 4 species). Other well represented families included Malvaceae, Nyctaginaceae, Cucurbitaceae, Lamiaceae, and Rutaceae, each accounting for 3.57% (2 species). Several families, such as Acanthaceae, Amaranthaceae, and Apocynaceae, were represented by a single species each (1.79%). This taxonomic diversity reflects the ecological heterogeneity and ethnobotanical richness of the region, reinforcing the importance of local biodiversity in traditional medicine. Herbs constituted the majority of the recorded species (67.86%), indicating a community preference for fast-growing and easily accessible plant forms. Their prominence is associated with their widespread use in the treatment of common health conditions such as fever, gastrointestinal disturbances, and respiratory illnesses. This pattern emphasizes the centrality of herbaceous plants in rural primary healthcare systems and highlights their practical value in ethnomedicine[18,19,20]. Woody perennials, including shrubs (17.86%) and trees (10.71%), are predominantly employed in the treatment of chronic ailments, particularly those associated with inflammation, metabolic disorders, and long-term degenerative conditions[21]. Although climbers constituted a smaller fraction (3.57%) of the recorded flora, they are of considerable ethnomedicinal importance, especially in treating conditions like bone fractures, wounds, and dermatological disorders[22]. The diversity in plant growth forms documented at the Thanthai Hans Roever College (THRC) campus not only underscores the ecological richness of the region but also highlights its integral role in sustaining traditional medicinal practices.

Among the 56 species recorded, herbaceous plants were the most dominant (48.21%), likely due to their fast growth, ease of propagation, and widespread availability, making them a preferred choice in primary healthcare. Shrubs and trees, each comprising 14.29% of the documented species, are often reserved for more persistent or chronic health conditions, owing to the bioactive potency found in their woody tissues and bark. Climbers (12.50%) are valued for their niche applications, especially in orthopedic and skin-related treatments. Aquatic herbs, though representing only 1.79% of the flora, are traditionally appreciated for their detoxifying, cooling, and diuretic effects[23]. These findings reflect the THRC campus's dual ecological and ethnopharmacological significance and emphasize the urgency of conserving its biodiversity to preserve indigenous healthcare systems and facilitate future drug discovery initiatives.

Traditional healthcare practices utilizing medicinal plants are distinguished by diverse preparation methods and administration routes, each tailored to optimize therapeutic efficacy. Common formulations include fresh juices, pastes, decoctions, and infusions, with the specific plant part such as leaves, roots, or bark chosen based on the ailment being addressed. For instance, *Aloe vera* is frequently combined with turmeric (*Curcuma longa*) to prepare a topical paste, widely used to treat skin inflammation due to its antimicrobial and anti-inflammatory properties[24]. *Boerhavia diffusa* is traditionally prepared as a paste with honey, valued for its digestive, hepatoprotective, and diuretic activities[25]. The route of administration varies with the condition: oral use is typical for systemic illnesses for example, *Acalypha indica* leaf juice is employed in treating bronchitis[26] while topical applications, such as *Cissus quadrangularis* paste, are used to support bone healing and fracture recovery due to its osteogenic potential[27]. These ethnomedical strategies illustrate a nuanced understanding of plant pharmacodynamics among indigenous communities, such preparations are commonly applied for localized ailments. To enhance efficacy, absorption, or palatability, traditional formulations often incorporate supplementary ingredients such as water, milk, oils, or animal derived products. For example, *Argemone mexicana* leaf juice is traditionally mixed with milk for the treatment of malarial fever, leveraging both its antipyretic properties and the soothing effect of milk[28]. Similarly, coconut oil or egg yolk is added to pastes used for skin disorders to improve topical absorption and healing efficacy. This diversity in preparation methods reflects a deep empirical knowledge base, shaped by generations of experiential learning, cultural wisdom, and oral transmission. It underscores the adaptability and sustained relevance of traditional medicinal systems

in addressing evolving healthcare needs, especially in resource limited rural contexts.

## XI. CONCLUSION

This study documents 56 medicinal plant species from 33 families within the Thanthai Hans Roever College campus, Perambalur, highlighting strong local reliance on traditional healthcare. Herbs were most common, treating ailments like fevers, skin diseases, and digestive disorders. Key species such as *Azadirachta indica*, *Cissus quadrangularis*, and *Argemone mexicana* showed high therapeutic value based on ethnobotanical indices. Strong informant consensus underscores the cultural reliability of this knowledge. However, threats like habitat loss and fading traditions call for urgent conservation. Scientific validation is vital to integrate traditional practices with modern medicine and unlock future pharmacological potential.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Authors' Contributions

Sathish Kumar D, Baskaran A, and Thirumurugan A, Jeevanantham G conceived and designed the study. Balavivekananthan S, Nithiya P, and Gowri J contributed to fieldwork, data collection, and ethnobotanical interviews. Subashini G assisted in data analysis and literature review. All authors contributed to manuscript drafting and approved the final version of the manuscript.

Ethical Approval

Not applicable. This study did not involve any experiments on humans or animals requiring ethical approval.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Table 1 - Structured Interview for Ethnobotanical Data Collection

| S. No. | Age / Gender | Occupation | Part(s) Used | Preparation Method | Mode of Administration | Ailment Treated | Source of Knowledge |
|---|---|---|---|---|---|---|---|
| 1 | 60 / Male | Traditional Healer | Leaves | Decoction | Oral | Cold, Cough | Ancestral / Oral Tradition |
| 2 | 45 / Female | Farmer | Whole plant | Juice | Oral | Jaundice | Learned from elders |
| 3 | 55 / Male | Herbal Practitioner | Leaves | Paste, Decoction | Oral & Topical | Asthma, Cough | Personal experience |

Table 3 - Informant Consensus Factor (ICF) for the categorized ailments

| No. | Ailment Category | Number of Use Reports (N<sub>ur</sub>) | Number of Taxa (N<sub>t</sub>) | ICF |
|---|---|---|---|---|
| 1 | Gastro-intestinal | 142 | 9 | 0.94 |
| 2 | Respiratory | 90 | 5 | 0.96 |
| 3 | Dermatological | 75 | 12 | 0.85 |
| 4 | Febrile & malaria-like | 60 | 3 | 0.97 |
| 5 | Musculo-skeletal | 40 | 6 | 0.87 |

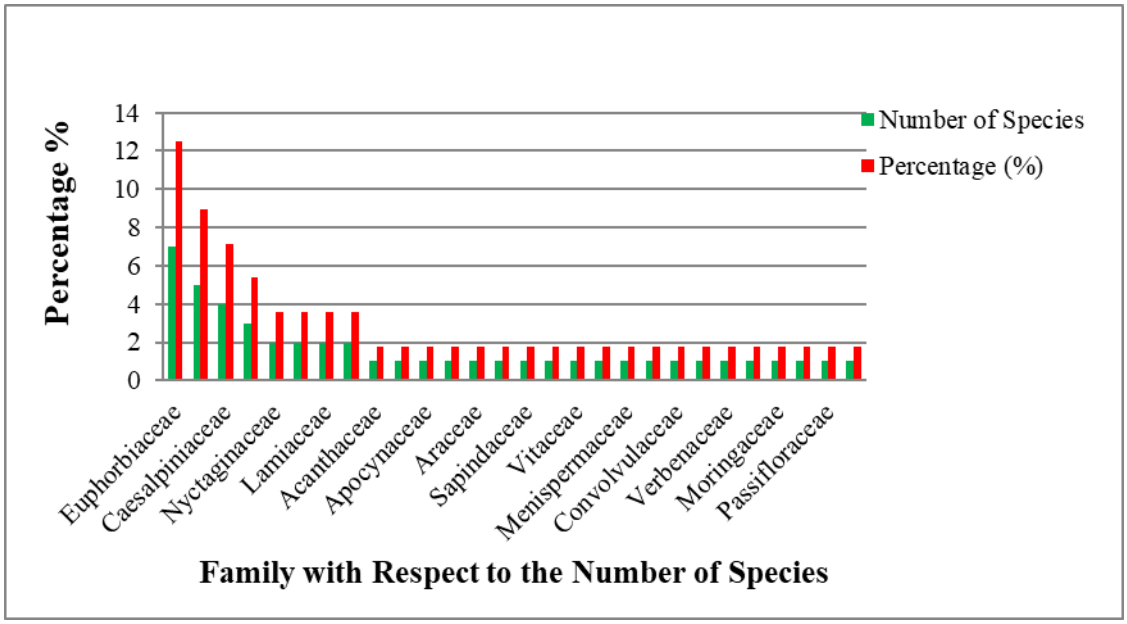


Fig. 1 - Distribution of Ethnomedicinal Plant Families by Number of Species and Percentage Composition

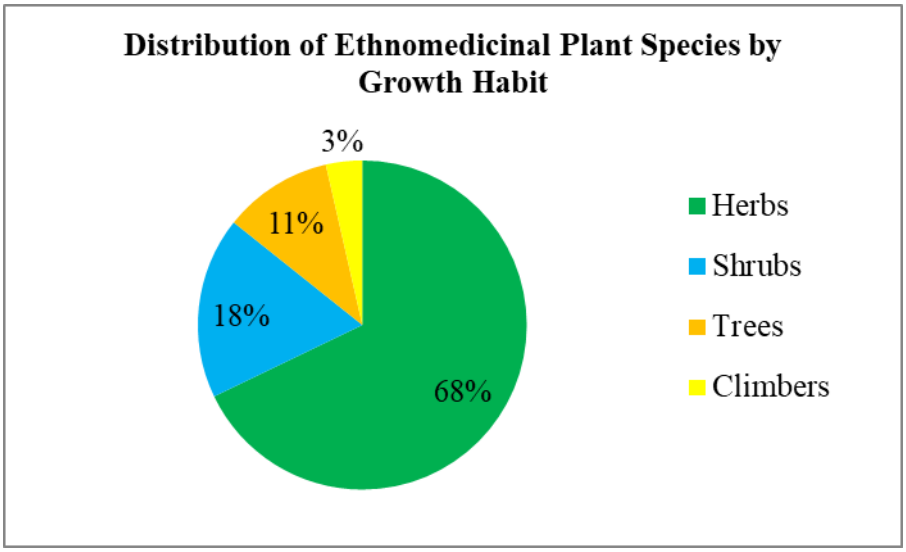


Fig. 2 - Proportional Representation of Ethnomedicinal Plant Species by Growth Form

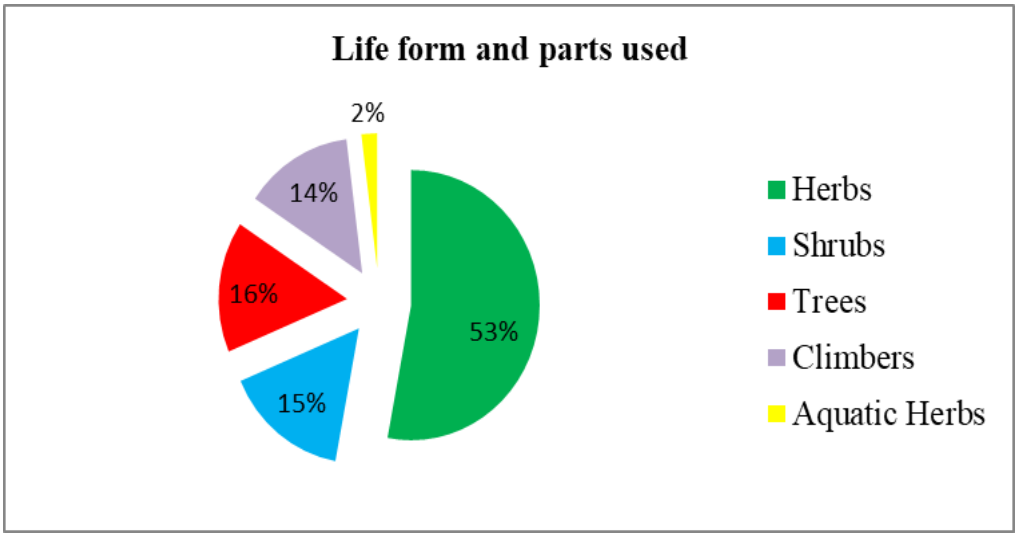


Fig. 3 - Distribution of Ethnomedicinal Plant Species by Life Form

Table 2 - Documentation of Ethnomedicinal Plants Used by Traditional Healers in THRC Campus, Perambalur District, Tamil Nadu

| S. No | Botanical Name | Family Name | Habit | Vernacular Name | Part Use | Medicinal Uses | Preparation Method | Disease Treated |
|---|---|---|---|---|---|---|---|---|
| 1 | *Abrus precatorius L.* | Fabaceae | Climber | Kundumani | Leaves | Root bark is ground with water, boiled and taken orally to treat Jaundice. Leaf and fruit juice is taken orally twice a day for two weeks to cure piles. | Juice | Oral |
| 2 | *Acalypha indica L.* | Euphorbiaceae | Herb | Kupaimeni | Leaves, Root, Stem | Leaf is useful in bronchitis, asthma, pneumonia, and rheumatism; roots and leaves have laxative properties. Juice of leaves is considered an efficient emetic. | Juice | Topical |

| S. No | Botanical Name | Family Name | Habit | Vernacular Name | Part Use | Medicinal Uses | Preparation Method | Disease Treated |
|---|---|---|---|---|---|---|---|---|
| 3 | *Acalypha wilkesiana Müll.Arg.* | Malvaceae | Herb | Ottuttutti | Leaves, Root | Infusion of leaves and roots is diuretic and demulcent; used in fevers, chest infections, gonorrhea, and urethritis. | Juice | Topical |
| 4 | *Achyranthes aspera Linn.* | Amaranthaceae | Herb | Naiyuruvi | Root, Stem, Leaves | Whole plant useful in treatment of vomiting, bronchitis, heart disease, piles, itching, abdominal pains, ascites, dyspepsia, dysentery, blood diseases. | Paste | Topical |
| 5 | *Aerva lanata (L.) Juss.* | Acanthaceae | Herb | SiruPeelai | Root | Root powder is taken with hot water orally twice a day for headache. Fresh leaf juice is given orally thrice a day for one week to treat diuretic and anthelmintic. | Juice | Oral |
| 6 | *Ageratum conyzoides L.* | Asteraceae | Herb | Pumppillu, Appakkoti | Root | Whole plant treats pneumonia, but the most common use is to cure wounds and burns. | Paste | Topical |
| 7 | *Allamanda cathartica L.* | Apocynaceae | Climbing shrub | Allamanda | Leaves, Root, Stem | A decoction of leaves, in small doses, is used as an antidote to poisoning and as a treatment for colic. | Powder | Topical |
| 8 | *Aloe vera (L.) Burm.f.* | Liliaceae | Herb | Sotrukatralai | Root, Leaves | The succulent leaves are crushed and mixed with turmeric, and the paste is applied on the eruptions on the body. | Paste | Oral |
| 9 | *Amaranthus viridis L.* | Amaranthaceae | Herb | Kupaikeerai | Leaves, Stem, Root | The tender branches and leaves of this plant are cooked as vegetables and eaten to cure digestive problems. | Powder | Oral |
| 10 | *Argemone Mexicana L.* | Papaveraceae | Herb | Bremmathndu | Root, Leaves | Leaf juice 50 ml mixed with cow's milk used for malarial fever. Seed powder is taken with water orally twice a day in jaundice, leprosy, and alterative. Latex is used to cure scorpion bite. | Juice | Oral |
| 11 | *Asparagus racemosus Willd.* | Asparagaceae | Climber | Thaneervitankilangu | Leaves, Stem, Root | The tuber juice mixed with water is given in the morning for 15 days to increase the potency and digestion. | Juice | Oral |
| 12 | *Azadirachta indica A. Juss.* | Meliaceae | Tree | Vembu | Leaves | Fresh leaves used in skin diseases and chicken pox. | Powder | Oral |
| 13 | *Barleria prionitis L.* | Malvaceae | Herb | Sem-mulli | Root, Leaves | Leaves and roots used for coughs and inflammations. | Paste | Oral |
| 14 | *Blepharis maderaspatensis* | Acanthaceae | Herb | Nethirampoondu | Root, Leaves, Stem | Leaf paste is mixed with powdered black gram, crushed onion, and white yolk of one egg; the mixture is applied topically over fractured bones. | Powder | Topical |
| 15 | *Boerhavia diffusa L.* | Nyctaginaceae | Herb | Mookiratai | Leaves, Root | Applied as a diuretic, stomachic, cardiotonic, hepatoprotective, laxative, anthelmintic, febrifuge, expectorant, and purgative. | Paste | Oral |
| 16 | *Boerhavia erecta L.* | Nyctaginaceae | Herb | Seemai Mookiratai | Leaves, Root | Decoction of the whole plant used to treat cough, fever, and jaundice. | Paste | Oral |

| S. No | Botanical Name | Family Name | Habit | Vernacular Name | Part Use | Medicinal Uses | Preparation Method | Disease Treated |
|---|---|---|---|---|---|---|---|---|
| 17 | *Bryophyllum pinnatum* | Crassulaceae | Herb | Ranakalli | Leaves, Root | The fresh leaves are pounded and applied to burns; used as poultices on boils and ulcers; treatment for headaches and ringworm. | Paste | Oral |
| 18 | *Butea monosperma (Lam.)* | Fabaceae | Tree | Ilaipurasu | Leaves, Bark | Bark astringent, used in piles, tumors, menstrual disorders. Butea gum is used in diarrhea. Seeds pounded with lemon juice for 'Dhobi's itch'. | Juice | Topical |
| 19 | *Caesalpinia pulcherrima (L.)* | Caesalpiniaceae | Tree | Mayilkonrai | Bark | Decoction or infusion of roots, bark, leaves, or flowers is used as a purgative and emmenagogue. | Powder | Topical |
| 20 | *Caladium bicolor (Aiton) Vent.* | Araceae | Shrub | Elephant's ear | Leaves, Stem | Powdered tuber used to treat facial skin blemishes. | Powder | Topical |
| 21 | *Calotropis procera (Aiton) W.T.Aiton* | Asclepiadaceae | Shrub | Vel Erukku | Stem, Leaves | Latex applied externally for dog bite and scorpion bite. Flower powder mixed with black pepper and salt is used for snake bite. | Powder | Oral |
| 22 | *Cardiospermum halicacabum L.* | Sapindaceae | Climber | Mudakathan | Leaves, Root, Stem | Stem of crushed leaves inhaled in tetanus; leaf decoction given internally for joint pains. | Decoction | Oral |
| 23 | *Cassia angustifolia* | Caesalpiniaceae | Shrub | Thirunelveli Avarai | Seed | Leaf paste applied for scabies, sores, cuts, and wounds to quicken healing. | Paste | Topical |
| 24 | *Senna auriculata (L.) Roxb.* | Caesalpiniaceae | Shrub | Avarai | Seed, Leaves | Leaf paste applied for body cooling. | Paste | Oral |
| 25 | *Cassia fistula L.* | Caesalpiniaceae | Tree | Sarakondrai | Leaves, Bark | Seeds effective in treating constipation and ulcers. Effective for treating piles. | Paste | Oral |
| 26 | *Catharanthus roseus (L.)* | Apocynaceae | Herb | Sudukattu Arali | Leaves, Flower | Whole plant treats malaria, diarrhea, diabetes, cancer, and skin diseases. | Paste | Topical |
| 27 | *Chloris barbata Sw.* | Poaceae | Herb | Chevvarakupul | Root, Flower | Externally used for skin disorders. Leaves juice used in fever, diarrhea, and diabetes. | Juice | Topical |
| 28 | *Cissus quadrangularis L.* | Vitaceae | Climbing herb | Pirandai | Whole plant | Paste of the whole plant grounded with egg and water is applied to fractured body parts. Stem pounded in water given orally for scurvy, epilepsy, asthma. | Paste | Oral |
| 29 | *Cleome gynandra L.* | Capparaceae | Herb | Nallavelai | Seed, Root, Stem | Leaf juice mixed with sugar is given internally for vermifuge and jaundice. | Juice | Oral |
| 30 | *Clitoria ternatea L.* | Fabaceae | Herb | Sangupoo | Flower, Root, Stem | Leaves juice taken orally for dropsy and antipyretic. | Juice | Oral |
| 31 | *Coccinia grandis* | Cucurbitaceae | Climber | Kovai | Fruit, Leaves | Leaves famous for hypoglycemic and antidiabetic properties. | Paste | Topical |

| S. No | Botanical Name | Family Name | Habit | Vernacular Name | Part Use | Medicinal Uses | Preparation Method | Disease Treated |
|---|---|---|---|---|---|---|---|---|
| | *(L.) Voigt* | | | | | | | |
| 32 | *Cocculus hirsutus (L.)* | Menispermaceae | Climber | Kattukodi | Leaves | Roots are bitter, digestive, diuretic, anti-pyretic, tonic, and useful in poisonous bites, skin diseases, cough, and hypertension. | Paste | Topical |
| 33 | *Codiaeum variegatum (L.) A.Juss.* | Euphorbiaceae | Shrub | Croton | Leaves, Root | Juice of the fresh bulb used as an emetic. | Juice | Topical |
| 34 | *Coleus blumei* | Lamiaceae | Herb | Coleus | Root | Roots used internally to treat diarrhea and colic. | Paste | Topical |
| 35 | *Commelina benghalensis L.* | Commelinaceae | Herb | Kanavazhai | Root, Leaves, Stem | Leaves and stems used as vegetables and as feed for livestock. Also used for ailments such as sore feet, sore throat, burns, eye irritation, and stomach irritation. | Paste | Topical |
| 36 | *Euphorbia hirta L.* | Euphorbiaceae | Herb | Amman Patcharisi | Leaves, Stem, Root | Paste of whole plant applied twice a day to heal wounds. | Paste | Topical |
| 37 | *Euphorbia milii Des Moul.* | Euphorbiaceae | Herb | Paal Perukki | Root, Leaves | Leaves cooked with ghee and eaten to remove gas and induce digestion. | Paste | Topical |
| 38 | *Euphorbia rosea Retz.* | Euphorbiaceae | Shrub | Chinnamman Pacharisi | Stem | Used for ringworm and skin cancer. | Paste | Oral |
| 39 | *Euphorbia tithymaloides L.* | Euphorbiaceae | Shrub | Kannadi Kalli | Leaves, Root | Used for ringworm and skin cancer. | Paste | Topical |
| 40 | *Evolvulus alsinoide (Linn.)* | Convolvulaceae | Herb | Visnukiranthi | Leaves, Stem, Root | Plant acts as tonic and febrifuge. Also used as vermifuge; along with oil used in promoting hair growth. | Paste | Topical |
| 41 | *Ficus tinctoria G.Forst.* | Moraceae | Tree | Kalatthi | Leaves, Bark | Decoction of plant juices and leaves used as an internal remedy for weakness after childbirth. | Juices | Topical |
| 42 | *Fleugge aleucopyrus* | Euphorbiaceae | Shrub | Veppoolan | Leaves, Bark | Leaves boiled and taken twice a day for stomachache. | Boiled | Rubbing |
| 43 | *Vitex negundo Linn.* | Verbenaceae | Tree | Notchi | Leaves | Juice of root bark taken internally. | Paste | Topical |
| 44 | *Sida acuta* | Malvaceae | Herb | Arivalmanai poondu | Leaves | Paste of leaves mixed with coconut oil applied on head regularly for killing dandruff and strengthening hair. | Paste | Topical |
| 45 | *Mimosa pudica Linn.* | Mimosaceae | Herb | Thottasinungi | Leaves | Extracts of the plant shown to be a moderate diuretic, depresses duodenal contractions similarly to atropine sulfate. | Paste | Topical |
| 46 | *Moringa oleifera* | Moringaceae | Tree | Murungai | Leaves | Leaves used for reducing blood pressure. Regular consumption treats anemia. | Decoction | Oral |

| S. No | Botanical Name | Family Name | Habit | Vernacular Name | Part Use | Medicinal Uses | Preparation Method | Disease Treated |
|---|---|---|---|---|---|---|---|---|
| | *Lampk.* | | | | | | | |
| 47 | *Mukia aderspata na Linn.* | Cucurbitaceae | Climber | Musu-Musukkai | Leaves | Leaves known for hypoglycemic and antidiabetic properties. | Paste | Oral |
| 48 | *Murraya koenigii* | Rutaceae | Tree | Karuvepillai | Leaves | Paste of leaves applied over wounds. | Paste | Topical |
| 49 | *Nelumbo nucifera Linn.* | Nymphaeaceae | Aquatic herb | Thamarai | Whole Plant | Plant reported to possess tonic, diuretic, and demulcent properties. | Paste | Oral |
| 50 | *Nerium oleander* | Apocynaceae | Herb | Arali | Stem, Bark, Leaves | Leaves considered a valuable homeopathic drug for enuresis, neuralgia, headache, and cold-borne cough. Tincture useful for bleeding piles. | Paste | Topical |
| 51 | *Ocimum tenuiflorum Linn.* | Lamiaceae | Herb | Thulasi | Leaves | Juice of leaves taken orally on an empty stomach to cure cold. | Paste | Topical |
| 52 | *Opuntia dillenii Linn.* | Cactaceae | Herb | Sappathi Kalli | Stem | Fruits used to treat gonorrhea. Fruits paste applied on snake bite and dog bite. | Paste | Topical |
| 53 | *Passiflora foetida Linn.* | Passifloraceae | Climbing Herb | Muppari savalli | Whole Plant | Helps treat digestive problems, including dyspepsia and diarrhea. | Paste | Topical |
| 54 | *Ricinus communis Linn.* | Euphorbiaceae | Shrub | Amanaku | Leaves | Juice of the fresh bulb used as an emetic. | Paste | Topical |
| 55 | *Ruta graveolens Linn.* | Rutaceae | Herb | Aruvatham Thalai | Seed | Decoction used in cases with strong scents, range in form and size from herbs to large trees. | Decoction | Topical |
| 56 | *Sesbania grandiflora Pers.* | Fabaceae | Tree | Agathi | Bark | Bark astringent, used in piles, tumors, and menstrual disorders. Gum is astringent and used in diarrhea. Seeds pounded with lemon juice used for herpes. | Decoction | Bath |