

## Original Research Article

# EXPLORING THE BIODIVERSITY OF TREES AND SHRUBS IN SOUTHERN INDIA: A STUDY AT TIRUNELVELI'S SCIENCE CENTRE FOR CONSERVATION AND SUSTAINABILITY

## ABSTRACT

A comprehensive taxonomical floristic survey conducted at the District Science Centre in Tirunelveli identified 84 species of trees and shrubs, meticulously documenting each species with detailed information on medicinal uses, family classification, commercial importance, and population count of individual plants. The survey identified 33 families and 68 genera, with Fabaceae being the most dominant family, followed by Rubiaceae, Arecaceae, and Malvaceae. Additionally, the survey highlighted a list of vulnerable, threatened, and endangered tree species, emphasizing the need for conservation efforts based on their spatial reach and anthropogenic pressures. These species face various threats, including loss of habitat, agriculture, pollution load, and recreational disturbances, and were assessed according to the IUCN Red List criteria. This study provides valuable insights for botanists, conservationists, and policymakers, promoting sustainable management and protection of plant biodiversity in the region.

**Keywords:** Tirunelveli Science Centre; Medicinal plants; Conservation of plants; flora diversity.

## 1. INTRODUCTION

The District Science Centre in Tirunelveli serves as a significant repository of plant biodiversity, encompassing a wide array of tree and shrub species. As an entertainment centre, it combines education and entertainment, attracting tourists and operating under the NCSM network of India. With the support of the local community, the Centre aims to make science and technology more accessible and appealing to the general public, complementing formal science education. This study undertakes a meticulous taxonomical survey of the flora within the Centre, identifying distinct varieties of trees and shrubs to conserve species biodiversity.

Conservation efforts focused on indigenous plants are pivotal for maintaining biodiversity and ensuring the sustainability of ecosystems. Indigenous plants, naturally adapted to specific regions, fulfill critical roles in local ecosystems by providing habitats and food for wildlife, contributing to soil fertility, and supporting cultural practice. This approach not only aids in preserving diverse tree species but also fosters a thriving community of organisms (Markku, 2008; Gao and Weibang, 2013; Kulak *et al.*, 2022). Cultivating a variety of tree species within a single location enhances ecosystem resilience against environmental changes and creates habitats for a wide range of wildlife, from insects to birds (Chen *et al.*, 2016).

Botanical gardens play a crucial role in conservation approaches that involve preserving plants within their native habitats, ensuring their continued survival, and their ability to contribute to local ecosystems (Abeli *et al.*, 2020; Coelho *et al.*, 2020). Botanical gardens serve not only as living showcases of plant diversity but also actively engage in research, conservation breeding programs, and public education, making significant contributions to global conservation initiatives (Ma *et al.*, 2013; Breman *et al.*, 2021). These efforts are crucial for preserving ecosystem services like clean air, water, and climate regulation, thereby mitigating the threats posed by habitat destruction, climate change, and other environmental challenges.

The purpose of the survey to assessing the conservation status of these plants, identifying species at risk those that are vulnerable, threatened, and endangered. By highlighting the importance of these species and their various applications, this research aims to inform and guide efforts in botanical conservation, sustainable use, and policy formulation. The findings of this survey are intended to support botanists, conservationists, and policymakers in their endeavours to preserve and manage the plant diversity within the District Science Centre, ensuring its continued contribution to ecological stability and community well-being.

**Comment [H1]:** Why you exclude climbers and herbs ??????

**Comment [H2]:** The title is suitable, but a little bit lengthy, so it would be better if you amend it to "Biodiversity Assessment of Trees and Shrubs at Tirunelveli's Science Center: A Conservation Perspective."

**Comment [H3]:** Don't forget to put the corresponding author and give cell phone number, Fax number, and email Id. Then type the affiliations of all authors

**Comment [H4]:** The abstract is not fully comprehensive: please update it with the following suggested additions and deletions.

### Additions:

✓ **Purpose of the study:** Clearly state the research's purpose at the beginning of the abstract to provide context. For example, "This study aims to assess the biodiversity of trees and shrubs in Southern India, focusing on their ecological and medicinal significance."

✓ **Significance of Findings:** Include a statement about the implications of the findings for conservation strategies. For instance, "The findings underscore the urgent need for targeted conservation efforts to protect vulnerable species and their habitats."

✓ **Methodology Brief:** Add a brief mention of the methodology used for data collection, such as "A comprehensive field survey was conducted, utilizing both visual identification and population assessments."

### Deletions:

✓ **Redundant Phrasing:** Remove repetitive phrases that do not add value, such as "meticulously documenting each species" since documentation is implied in the context of a survey.

✓ **Oversly Detailed Lists:** Consider condensing detailed lists of families and genera to focus on key findings. For instance, instead of listing all families, state "The survey identified 33 families, with Fabaceae being the most prominent."

✓ **Excessive Threat Descriptions:** Streamline the description of threats to focus on major categories rather than listing all specific threats. For example, simplify to "These species face significant threats from habitat loss and anthropogenic pressures."

**Comment [H5]:** Distinguish between Flora Vs flora

**Comment [H6]:** Please write a brief overview of the existing literature related to your title and justify the need of your research in detail

**Comment [H7]:** Please provide a clearly defined problem, Objectives of the study (i.e. general and specific objective), and the scope and justification of the work done.

For instance, The biodiversity of trees and shrubs in the District Science Centre, Tirunelveli, is under threat due to anthropogenic pressures such as habitat loss, pollution, and recreational disturbances. Despite the ecological significance of this area, there is a lack of comprehensive data on the species present and their conservation status. This gap in knowledge hinders effective management and ... [1]

## 2. MATERIALS & METHODS

### 2.1 Study area description Geography area and site study

The data collection encompassed the regions within the District Science Centre, situated near the Collector Office in Kokkirakulam, Tirunelveli Corporation, adjacent to the banks of the sacred river Tamiraparani (Fig.1). The study area spans a latitudinal range of 8.7268° N and a longitudinal range of 77.7165° E.

**Comment [H8]:** Write details of the study area description, such as location, diversity range of flora, ecological significance, and anthropogenic pressure

### 2.2 Methodology

In the present study, field trips were conducted to explore the tree species within the selected area. Standard methodology was employed and recorded on index cards for each species.

**Fig 1: Geographic Location and site area of the study**

**Comment [H9]:** Methodology ?????? Please Write details of the data collection methods such as Field survey (involved systematic sampling techniques, where specific plots were established to record species presence and abundance), Plant species identification, (using standard taxonomic keys and reference floras. Field guides and expert consultations should also employ to confirm species identification), Ecological Measurements, (Population dynamics can be assessed by measuring the height, diameter at breast height (DBH), and health status of individual trees and shrubs), and Conservation Status Assessment (The conservation status of species can be determined using the IUCN Red List criteria. Species can be also categorized as vulnerable, threatened, or endangered based on their population trends and threats faced in their habitat. Data on threats such as habitat loss, pollution, and recreational disturbances can be collected through direct observations and local interviews).

Collected plant specimens were processed at the Botany laboratory of St. Xavier's College (Autonomous), Palayamkottai. The plant identification was conducted using references such as, Gamble JS(1847-1925) Flora of the Presidency of Madras and "The Flora of the Palani Hills, South India" (3 volumes) by Matthew KM (1999).

## 3. RESULTS AND DISCUSSION

The District Science Centre in Tirunelveli not only serves as an educational and scientific hub but also as a vibrant botanical sanctuary. It is home to an impressive array of flora, with 84 distinct species of trees and shrubs meticulously catalogued, representing 33 different plant families. This rich biodiversity offers visitors a unique opportunity to explore and learn about various plant species in their natural habitat. The detailed mapping of trees and shrubs within the campus enhances the educational experience, allowing for a better understanding of plant ecology and the importance of biodiversity conservation (Figure 2). The comprehensive list of trees and shrubs provides a valuable resource for researchers, students, and nature enthusiasts interested in studying the region's flora (Table 1).

Fig 2: Mapping of Trees and shrubs showing within the campus of District Science Centre, Tirunelveli.

**Comment [H10]:** Please put clear and coordinated map of the study area

**Comment [H11]:** Be consistent in text citation

**Fig 2: Mapping of Trees and Shrubs showing within the campus of District Science Centre, Tirunelveli**

**Comment [H12]:** Ways of data analysis ???????????

The collected data can be analyzed quantitatively to determine species richness, diversity indices (such as Shannon-Wiener index), and community composition. Statistical analyses can be also performed using software tools like SPSS or R to evaluate relationships between species diversity and environmental factors.

**Table 1: List of Trees and Shrubs in District Science Center, Tirunelveli**

Code No.	Botanical Name	Family	Vernacular Name
DSCTEN001	<i>Acacia auriculiformis</i> A. Cunn. ex Benth.	Fabaceae	Earleafaciasia
DSCTEN002	<i>Adenanthera pavonina</i> L.	Fabaceae	Red bead tree
DSCTEN003	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	Indian bael
DSCTEN004	<i>Ailanthus excels</i> Roxb.	Simaroubaceae	Tree of heaven
DSCTEN005	<i>Albizia lebbek</i> (L.) Benth.	Fabaceae	Siris
DSCTEN006	<i>Alstoniascholaris</i> (L.) R.Br.	Apocynaceae	Devil
DSCTEN007	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Jack fruit
DSCTEN008	<i>Averrhoa carambola</i> L.	Oxalidaceae	Star pickle
DSCTEN009	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Neem
DSCTEN010	<i>Bambusa arundinacea</i> (Retz.) Willd.	Poaceae	Indian thorny
DSCTEN011	<i>Bauhinia purpurea</i> L.	Fabaceae	Purple butterfly tree
DSCTEN012	<i>Borassus flabellifer</i> L.	Arecaceae	Palmyra palm
DSCTEN013	<i>Caesalpinia pulcherrima</i> (L.) Sw.	Fabaceae	Peacock flower
DSCTEN014	<i>Callistemon lanceolatus</i> (Sm.) Sweet	Myrtaceae	Crimson bottlebrush
DSCTEN015	<i>Caryotaurens</i> L.	Arecaceae	Fishtail palm
DSCTEN016	<i>Cassia fistula</i> L.	Fabaceae	Golden rain
DSCTEN017	<i>Cassia javanica</i> L.	Fabaceae	Pink shower
DSCTEN018	<i>Cassia siamea</i> Lam.	Fabaceae	Iron wood tree
DSCTEN019	<i>Casuarina equisetifolia</i> L.	Casuarinaceae	Whistling pine

**Comment [H13]:** The result and discussion part are too shallow. Therefore, please reveal the key findings of dominant species, endangered species, anthropogenic impacts, ecological significance, and discuss by comparing with related studies.

**Comment [H14]:** Insert title of tables and figures via caption and apply it to all tables and figures

**Comment [H15]:** Code No or Voucher specimen ?????

**Comment [H16]:** Please add Growth form, Height, diameter at breast height (DBH), importance, and health status of individual trees and shrubs

DSCTEN020	<i>Ceiba pentandra</i> (L.) Gaertn.	Malvaceae	Silk cotton tree
DSCTEN021	<i>Cocos nucifera</i> L.	Arecaceae	Coconut tree
DSCTEN022	<i>Cordia dichotoma</i> G.Forst.	Boraginaceae	Assyrian plum
DSCTEN023	<i>Couroupita guianensis</i> Aubl.	Lecythidaceae	Cannon ball tree
DSCTEN024	<i>Cycas beddomei</i> Dyer	Cycadaceae	-
DSCTEN025	<i>Cycas revolute</i> Thunb.	Cycadaceae	Japanese sago palm
DSCTEN026	<i>Delonix regia</i> (Boj. Ex Hook.) Raf.	Fabaceae	Flame
DSCTEN027	<i>Duranta erecta</i> L.	Verbenaceae	Sky flower
DSCTEN028	<i>Ensete superbum</i> (Roxb.) Cheesman	Musaceae	Wild plantain
DSCTEN029	<i>Ervatamia divaricata</i> (L.) Burkill	Apocynaceae	Crape jasmine
DSCTEN030	<i>Erythrina variegata</i> L.	Fabaceae	Indian coral tree
DSCTEN031	<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Tasmanian blue gum
DSCTEN032	<i>Ficus benghalensis</i> L.	Moraceae	Banyan fig
DSCTEN033	<i>Ficus racemosa</i> L.	Moraceae	Cluster fig
DSCTEN034	<i>Ficus religiosa</i> L.	Moraceae	Peepul
DSCTEN035	<i>Gardenia jasminoides</i> J.Ellis.	Rubiaceae	Cape jasmine
DSCTEN036	<i>Grewia asiatica</i> L.	Malvaceae	Phalsa
DSCTEN037	<i>Guazuma ulmifolia</i> Lam.	Sterculiaceae	Bastard cedar
DSCTEN038	<i>Hamelia patens</i> Jacq.	Rubiaceae	Firebush
DSCTEN039	<i>Holarthra pubescens</i> Wall. Ex G.Don	Apocynaceae	Fever pod
DSCTEN040	<i>Ixora coccinea</i> L.	Rubiaceae	Jungle jeranium
DSCTEN041	<i>Ixora parviflora</i> Lam.	Rubiaceae	Small flower ixora
DSCTEN042	<i>Juniperus</i> sp.	Cupressaceae	-
DSCTEN044	<i>Lagerstroemia indica</i> x <i>fauriei</i> 'Natchez'	Lythraceae	Queen of shrubs
DSCTEN043	<i>Lagerstroemia indicia</i> (L.) Pers.	Lythraceae	Queen of shrubs
DSCTEN045	<i>Lawsonia inermis</i> L.	Lythraceae	Henna
DSCTEN046	<i>Madhuca longifolia</i> (J.Koenig ex L.) J.F.Macbr.	Sapotaceae	Indian butter tree
DSCTEN047	<i>Malphigia emarginata</i> DC.	Malphigiaceae	Barbados cherry
DSCTEN048	<i>Mangifera indica</i> L.	Anacardiaceae	Mango
DSCTEN049	<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae	Sapota
DSCTEN050	<i>Millingtonia hortensis</i> L.f.	Bignoniaceae	Tree jasmine
DSCTEN051	<i>Mimusops elengi</i> L.	Sapotaceae	Spanish cherry
DSCTEN052	<i>Morinda tinctoria</i> Roxb.	Rubiaceae	Indian mulberry
DSCTEN053	<i>Moringa oleifera</i> Lam.	Moringaceae	Horseradish
DSCTEN054	<i>Murrayakoenigii</i> (L.) Sprengel.	Rutaceae	Curry leaf
DSCTEN055	<i>Mussaenda hirsutissima</i> (Hook.f.) Hutch.ex.Gamble.	Rubiaceae	-
DSCTEN056	<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Rubiaceae	Bur flower tree
DSCTEN057	<i>Parkia biglandulosa</i> R.Br.	Fabaceae	Kiboko
DSCTEN058	<i>Peltophorum pterocarpum</i> (DC.) K.Heyne.	Fabaceae	Yellow flame
DSCTEN059	<i>Phoenix dactylifera</i> L.	Arecaceae	Wild dates tree
DSCTEN060	<i>Phyllanthus acidus</i> (L.) Skeels.	Phyllanthaceae	Star gooseberry
DSCTEN061	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Indian gooseberry
DSCTEN063	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fabaceae	Madras thorn
DSCTEN064	<i>Polyalthia longifolia</i> (Sonn.) var. <i>pendula</i>	Annonaceae	False ashoka
DSCTEN065	<i>Pongamia pinnata</i> (L.) Panigrahi	Fabaceae	Pongam oil tree
DSCTEN066	<i>Pritchardia pacifica</i> Seem.	Arecaceae	Fiji fan palm
DSCTEN062	<i>Psidium guajava</i> L.	Myrtaceae	Guava tree
DSCTEN067	<i>Pterocarpus santalinus</i> L.f.	Fabaceae	Red sandal wood
DSCTEN068	<i>Pterospermum acerifolium</i> (L.) Willd.	Malvaceae	Bayur tree
DSCTEN069	<i>Ravenala madagascarensis</i> Sonn.	Strelitziaceae	Traveller's tree
DSCTEN070	<i>Russelia aquisetiformis</i> Schlecht & Cham.	Plantaginaceae	Fire cracker plant
DSCTEN071	<i>Santalum album</i> L.	Santalaceae	Sandal wood
DSCTEN072	<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	Ashoka

DSCTEN073	<i>Spathodeacampanulata</i> Beauv.	Bignoniaceae	African tulip tree
DSCTEN074	<i>Sterculia foetida</i> L.	Malvaceae	Hazel sterculia
DSCTEN075	<i>Stereospermum chelonoides</i> DC.	Bignoniaceae	Fragrant padri tree
DSCTEN076	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae	Mahogany
DSCTEN077	<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Java plum
DSCTEN078	<i>Tabebuia rosea</i> DC.	Bignoniaceae	Pink poui
DSCTEN079	<i>Tamarindus indica</i> L.	Fabaceae	Indian dates
DSCTEN080	<i>Tecoma stans</i> (L.) Juss. ex Kunth	Bignoniaceae	Yellow elder
DSCTEN081	<i>Tectona grandis</i> L.f.	Lamiaceae	Teak
DSCTEN082	<i>Terminalia catappa</i> L.	Combretaceae	Indian almond
DSCTEN083	<i>Thespesia populnea</i> (L.) Sol. ex Corrêa.	Malvaceae	Head ache
DSCTEN084	<i>Vitex altissima</i> L.f.	Lamiaceae	Peacock chaste

Among the notable families are Fabaceae, with the maximum representation of 15 species that follow Moraceae and Malvaceae (Fig. 3). The flora includes the root of *Acacia auriculiformis* which is utilized for alleviating aches and pains, at the same time while Neem is known for its applications in treating eczema. Species such as *Aegle marmelos* and *Ailanthus excelsa* serve medicinal purposes such as treating chronic Diarrhea and acting as a fever tonic, respectively. Each species in the collection offers unique medicinal properties, contributing to the biodiversity and therapeutic resources of the region (Table 2).

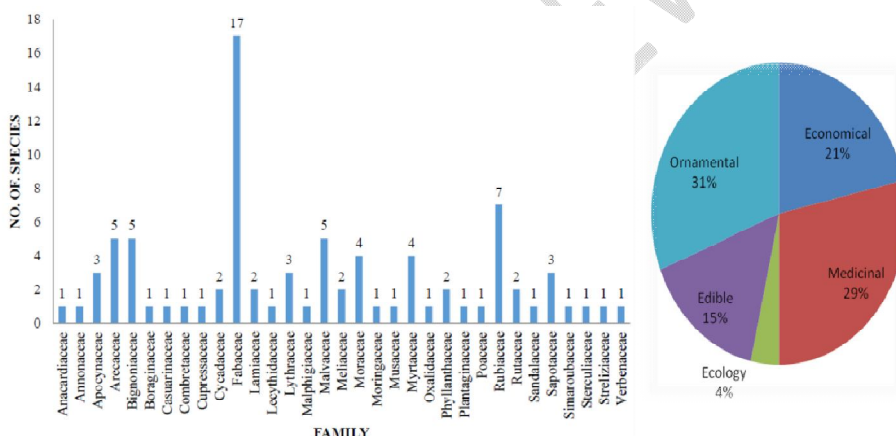


Fig 3: Family-wise screening of species diversity and its commercial importance

Table 2: Medicinal Uses of Trees and Shrubs in District Science Center, Tirunelveli

Code No.	Botanical Name	Useful part	Medicinal uses
DSCTEN001	<i>Acacia auriculiformis</i> A. Cunn. ex Benth.	Root	Aches and pains
DSCTEN002	<i>Adenantharpavonina</i> L.	Seed	Anti-inflammatory
DSCTEN003	<i>Aegle marmelos</i> (L.) Corrêa	Fruit	Chronic diarrhea
DSCTEN004	<i>Ailanthus excelsa</i> Roxb.	Bark	Fever and tonic
DSCTEN005	<i>Albizia lebbbeck</i> (L.) Benth.	Bark	Anti-allergic activity
DSCTEN006	<i>Alstoniascholaris</i> (L.) R.Br.	Bark	Diarrhea and indigestion remedy
DSCTEN007	<i>Artocarpus heterophyllus</i> Lam.	Leaves	Reduce high blood sugar
DSCTEN008	<i>Averrhoa carambola</i> L.	Leaves	Leprosy; skin ulcers and fever
DSCTEN009	<i>Azadirachta indica</i> A.Juss.	Root	Eczema
DSCTEN010	<i>Bambusa arundinacea</i> (Retz.) Willd.	Bark	Diarrhea
DSCTEN011	<i>Bauhinia purpurea</i> L.	Leaf stalk	Hiccough and gastric reflux
DSCTEN012	<i>Borassus flabellifer</i> L.	Leaves	Malaria and menstrual flow
DSCTEN013	<i>Caesalpinia pulcherrima</i> (L.) Sw.	Flower and fruit	Anti-bacterial & fungal activity
DSCTEN014	<i>Callistemon lanceolatus</i> (Sm.) Sweet	Flower	Gastric ulcer

Comment [H17]: Voucher specimen

Comment [H18]: Scientific name

Comment [H19]: Part used

Comment [H20]: Ailments treated

DSCTEN015	<i>Caryotaurens</i> L.	Leaves	Skin disorders
DSCTEN016	<i>Cassia fistula</i> L.	Root	Fever
DSCTEN017	<i>Cassia javanica</i> L.	Bark	Relieve ailments
DSCTEN018	<i>Cassia siamea</i> Lam.	Twigs; root	Anti-bacterial agent
DSCTEN019	<i>Casuarina equisetifolia</i> L.	Bark	Diuretic
DSCTEN020	<i>Ceiba pentandra</i> (L.) Gaertn.	Fruit	Hypoglycemic; Antidermatophytic
DSCTEN021	<i>Cocos nucifera</i> L.	Leaves	Anthelmintic; astringent
DSCTEN022	<i>Cordia dichotoma</i> G. Forst.	Leaves	Skin infections
DSCTEN023	<i>Couroupita guianensis</i> Aubl.	Flowers	Rheumatoid arthritis
DSCTEN024	<i>Cycas beddomei</i> Dyer	Leaves	Cancer and hepatoma
DSCTEN025	<i>Cycas revolute</i> Thunb.	Leaves	Diabetes
DSCTEN026	<i>Delonix regia</i> (Boj. Ex Hook.) Raf.	Fruit	Insecticide
DSCTEN027	<i>Duranta erecta</i> L.	Fruit	Diabetes and Leucorrhea
DSCTEN028	<i>Ensetes superbum</i> (Roxb.) Cheesman	Leaves	Anti-inflammatory action
DSCTEN029	<i>Ervatamia divaricata</i> (L.) Burkill	Bark and Root	Fever and Liver ailment
DSCTEN030	<i>Erythrina variegata</i> L.	Leaves	Sore throat; Sinusitis and colds
DSCTEN031	<i>Eucalyptus globulus</i> Labill.	Leaves and bark	Diarrhea and Polyuria
DSCTEN032	<i>Ficus benghalensis</i> L.	Fruit	Constipation
DSCTEN033	<i>Ficus racemosa</i> L.	Leaves	Inflammatory disorders
DSCTEN034	<i>Ficus religiosa</i> L.	Leaves	Fever and Kidney problems
DSCTEN035	<i>Gardenia jasminoides</i> J. Ellis.	Fruit juice	Anti-inflammatory agent
DSCTEN036	<i>Grewia asiatica</i> L.	Seeds	Dysentery; colds
DSCTEN037	<i>Guazuma ulmifolia</i> Lam.	Leaves	Sores; rashes; Anti-inflammatory
DSCTEN038	<i>Hamelia patens</i> Jacq.	Bark	Diarrhea; piles
DSCTEN039	<i>Holarrhena pubescens</i> Wall. Ex G. Don	Bark	Anthelmintic
DSCTEN040	<i>Ixora coccinea</i> L.	Root	Astringent; Antiseptics
DSCTEN041	<i>Ixora parviflora</i> Lam.	Leaves	Diabetes
DSCTEN042	<i>Juniperus</i> sp.	Fruit	Urinary tract infections (UTI)
DSCTEN043	<i>Lagerstroemia indicia</i> (L.) Pers.	Flower	Common colds
DSCTEN044	<i>Lagerstroemia indica</i> x <i>fauriei</i> 'Natchez'	Flower	Ornamental value
DSCTEN045	<i>Lawsonia inermis</i> L.	Leaves	Dandruff; Scabies; Eczema
DSCTEN046	<i>Madhuca longifolia</i> (J. Koenig ex L.) J. F. Macbr.	Flower; oil	Skin disease and body pain
DSCTEN047	<i>Malphigia marginata</i> DC.	Fruits	Liver Ailments and Diarrhea
DSCTEN048	<i>Mangifera indica</i> L.	Leaves	Diabetes
DSCTEN049	<i>Manilkara zapota</i> (L.) P. Royen	Fruit	Anti-oxidant
DSCTEN050	<i>Millingtonia hortensis</i> L. f.	Leaves	Anti-pyretic; Asthma
DSCTEN051	<i>Mimusops elengi</i> L.	Seeds	Astringent
DSCTEN052	<i>Morinda tinctoria</i> Roxb.	Leaves	Scabies; itching and hip pain
DSCTEN053	<i>Moringa oleifera</i> Lam.	Leaves and Fruit	Antioxidant
DSCTEN054	<i>Murrayakoenigii</i> (L.) Sprengel.	Leaves	Cures liver dysfunctions
DSCTEN055	<i>Mussaenda hirsutissima</i> (Hook. f.) Hutch. ex. Gamble.	Leaves	Anti-inflammatory
DSCTEN056	<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Dry leaves	Buboes and Hydrocele
DSCTEN057	<i>Parkia biglandulosa</i> R. Br.	Leaves	Parasitic infections
DSCTEN058	<i>Peltophorum pterocarpum</i> (DC.) K. Heyne.	Leaves	Intestinal problems
DSCTEN059	<i>Phoenix dactylifera</i> L.	Gum	Diarrhea
DSCTEN060	<i>Phyllanthus acidus</i> (L.) Skeels.	Leaves	Sciatica and Rheumatism
DSCTEN061	<i>Phyllanthus emblica</i> L.	Fruits	Controls Hair loss
DSCTEN062	<i>Psidium guajava</i> L.	Fruits & Leaves	Immune booster
DSCTEN063	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Bark	Chronic diarrhea
DSCTEN064	<i>Polyalthia longifolia</i> (Sonn.) var. <i>pendula</i>	Leaves	Skin diseases and Fever

**Comment [H21]:** Add harvesting method, habit, form of remedy preparation, route of administration, and please merge table one and table two into one table

DSCTEN065	<i>Pongamia pinnata</i> (L.) Panigrahi	Oil & Leaves	Rheumatism&Colds-Coughs.
DSCTEN066	<i>Pritchardia pacifica</i> Seem.	Leaves	Achesand pains
DSCTEN067	<i>Pterocarpus santalinus</i> L.f.	Wood	Economicvalue- Timber
DSCTEN068	<i>Pterospermum macerifolium</i> (L.) Willd.	Flowers&Leaves	Anti inflammatory
DSCTEN069	<i>Ravenalamadagascarensis</i> Sonn.	Leaves	Ornamental
DSCTEN070	<i>Russeliaequisetiformis</i> Schlecht& Cham.	Leaves	TreatsMalarial; Cancer
DSCTEN071	<i>Santalum album</i> L.	Wood	Common colds
DSCTEN072	<i>Saracaasoca</i> (Roxb.) Willd.	Bark	Uterinefibroids
DSCTEN073	<i>Spathodeacampanulata</i> Beauv.	Bark	Ulcer;Skin disease
DSCTEN074	<i>Sterculia foetida</i> L.	Bark	Diaphoreticand diuretic
DSCTEN075	<i>Stereospermumchelonooides</i> DC.	Root & Bark	Diureticand Cardiac tonic
DSCTEN076	<i>Swietenia mahagoni</i> (L.) Jacq.	Bark	Amoebiasis and Anemia
DSCTEN077	<i>Syzygiumcumini</i> (L.) Skeels.	Fruit	Hyperglycemia
DSCTEN078	<i>Tabebuia rosea</i> DC.	Leaves	Feverand Pains
DSCTEN079	<i>Tamarindus indica</i> L.	Fruit	Gallbladderproblems
DSCTEN080	<i>Tecoma stans</i> (L.) Juss. ex Kunth	Flower &Leaves	DiabetesandDiuretic
DSCTEN081	<i>Tectona grandis</i> L.f.	laxative	Graviduterus
DSCTEN082	<i>Terminalia catappa</i> L.	Leaves	Liverdiseases
DSCTEN083	<i>Thespesia populnea</i> (L.) Sol. ex Corr�ea.	Bark	Anti-bacterial–Fungal agent
DSCTEN084	<i>Vitex altissima</i> L.f.	Leaves	Ulcerand allergic

**Table 3: List of Vulnerable, Threatened and Endangered Trees in District Science Centre, Tirunelveli**

Code	Botanical name	Family	IUCN Status
DSCTEN024	<i>Cycas beddomei</i> Dyer.	Cycadaceae	Endangered
DSCTEN067	<i>Pterocarpus santalinus</i> L.f.	Fabaceae	Near Threatened
DSCTEN071	<i>Santalum album</i> L.	Santalaceae	Vulnerable
DSCTEN072	<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	Vulnerable
DSCTEN076	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae	Endangered

This extensive collection not only supports the ecological balance but also serves educational and medicinal purposes. The presence of diverse species like the Peacock chaste tree (*Vitex altissima*), Indian almond (*Terminalia catappa*) and Sandalwood (*Santalum album*) underlines the Centre's role in preserving both common, rare and vulnerable botanical varieties (Table 3). The medicinal uses range from anti-inflammatory and antibacterial agents to treatments for diabetes and skin disorders, highlighting the practical applications of these plants in traditional medicine. Additionally, trees like *Albizia lebeck*, effective against allergies, and *Alstonia scholaris*, used for diarrhea and indigestion remedies, contribute significantly to the Centre's collection. Other species like *Casuarina equisetifolia* (Whistling pine) and *Azadirachta indica* also show significant presence. Economically valuable species such as *Cocos nucifera* (Coconut tree) being the most abundant at 23 individuals and other ornamental plants like *Delonix regia* (Flame tree) ensure that the Centre is not only a repository of medicinal plants but also a vital green space that supports ecological balance and educational opportunities.

#### 4. CONCLUSION

In conclusion, our comprehensive floristic survey at the District Science Centre in Tirunelveli has meticulously documented and catalogued 84 distinct species of trees and shrubs, representing 33 different families. This significant finding underscores the Centre's unique role as both an educational institution and a crucial botanical repository, where the rich diversity of plant life is both studied and preserved. The survey has deepened our understanding of the local flora, providing critical insights into the ecological roles and medicinal uses of these species, many of which are integral to the region's natural heritage. By systematically inventorying these species, our research serves as a valuable resource for ongoing and future conservation efforts, offering a scientific basis for protecting and managing these important plant populations. Moreover, this study emphasizes the urgent need for biodiversity preservation, which is essential not only for maintaining ecological stability but also for supporting the health and well-being of the local community. The findings highlight the interconnectedness of education, conservation, and community well-being, making a strong case for

**Comment [H22]:** Write the full name of the scientific name (such as *Terminalia catappa* L.) and apply it to all

continued efforts to safeguard the botanical diversity of the District Science Centre for generations to come.

**Comment [H23]:** Compose a note acknowledging the authors' contributions, conflicting interests, consent (if applicable), and ethical approval (if applicable).

**Comment [H24]:** Kindly draft suggestions regarding garden development, greenhouse construction, pruning operations, and educational programs.

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to be implemented to protect plant

University's campus in Tirunelveli, Tamil Nadu, and shrub species. It encompasses a baseline survey and quantitative assessments of the impacts of urbanization on plant diversity and

existing knowledge gaps regarding urban green spaces in settings like Tirunelveli. By the end of the study, this study will contribute to the development of sustainable management practices. Additionally, it will serve as an educational tool for students and faculty, fostering greater awareness of the importance of urban green spaces amidst increasing urbanization and

