TAXONOMICAL, ECOLOGICAL AND PHYTOSOCIOLOGICAL STUDIES ON SACRED GROVES OF PALAKKAD DISTRICT, KERALA STATE

Thesis submitted to University of Calicut for the award of the Degree of DOCTOR OF PHILOSOPHY IN BOTANY

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DECLARATION

I hereby declare that the thesis entitled **"Taxonomical, Ecological and Phytosociological studies on Sacred Groves of Palakkad district, Kerala state"** submitted by me in part – fulfillment of the degree of **Doctor of Philosophy** in Botany of the University of Calicut, has not been submitted for the award of any other degree or diploma, and it represents the original work done by me.

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DECLARATION

I hereby declare that the work presented in the thesis entitled 'Taxonomical, Ecological and Phytosociological Studies on Sacred groves of Palakkad District, Kerala State' is based on the original work done by me under the guidance of Dr. Udayan P S and has not been included in any other thesis submitted previously for the award of any degree. The contents of the thesisare undergone plagiarism check using iThenticate software at C.H.M.K. Library, University of Calicut, and using similarity index found within the permissible limit. I also declare that the thesis is free from AI generated contents.

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Praveenkumar K

ABSTRACT

Sacred groves, also known as sacred forests or temple forests, hold significant cultural, ecological, and spiritual importance in many regions. These protected areas in Kerala, India, are valued for their biodiversity, ecological benefits, and the preservation of indigenous and endangered species. Local communities use taboos, limitations, and traditional beliefs to maintain these groves, which are the last remaining intact forest sections in a landscape severely damaged by human activities like agriculture and deforestation. The Palakkad area is an important site for these groves, as they provide a home for a variety of species, including indigenous and endangered species. The local community reveres the sacred woods and often associates them with spirits or deities. These groves are essential for providing ecosystem services, such as water and air purification. From 70 sacred groves, 529 species belonging to 377 genera and 115 families were identified, listed, and herbaria prepared with available specimens. The flora of sacred groves in Palakkad district includes 181 herbs, 119 shrubs, 74 climbers, and 155 trees. The greatest diversity documented was found in Athippattamana Nagakanya Kshethram, with the minimum diversity observed in Punnakkodu Naga Kshethram representing only 11 species. Sacred groves are linked to various ceremonies that serve to meet our needs, such as banishing Sarpa Dosham and preventing diseases like vitiligo, psoriasis, and leprosy. Threats to sacred groves include shifts in belief systems, invasive species proliferation, construction of roads and temples, electric lines, and inadequate boundaries and fencing. Effective management and conservation are crucial to maintaining these ecologically important sites. Red listed plants, such as endangered and critically endangered species, are present in these groves. 39 endemic and 28 IUCN red listed plant species are documented from these groves.Out of 529 plants reported in Palakkad district, 303 are used for treating illnesses. However, unscientific collection and over-exploitation of these plants can compromise the assets and warrant sustainable management. Hindu religious rituals also heavily influence nature worship, affecting sociocultural and environmental aspects of cultures. Future generations need to preserve these precious groves. The sacred groves in Kerala are home to a variety of plant species, including the popular offerings to Serpent Gods. These groves are home to a high biodiversity, including IUCN Red List species and a keystone species, *Ficus benghalensis* L., which provides a niche for a significant

variety of birds and plants. However, overcrowding by invasive weeds reduces species diversity and destroys habitat in sacred groves. The increasing presence of invasive species and the pollution of soil and water contribute to the threat to these ecosystems. The survival of these groves is threatened by various development strategies and alterations in the social structure. In conclusion, the preservation of sacred groves is crucial for maintaining biodiversity and preserving the natural resources of the region.

സാരാംശം

കേരള സംസ്ഥാനത്തെ വലിയ ജില്ലകളിൽ ഒന്നും, പശ്ചിമഘട്ടത്തിന്റെ സ്വാഭാവിക വിടവായ വാളയാർ ചുരം കൊണ്ട് പ്രത്യേകതയുള്ളതുമായ പാലക്കാട് ജില്ലയിലെ 70 സർപ്പക്കാവുകൾ അല്ലെങ്കിൽ വിശുദ്ധവനങ്ങളിൽ നടത്തിയ വിശദമായതും, ആഴത്തിലുള്ളതുമായ പഠനത്തിൽ നിന്ന് 115 സസ്യകുടുംബങ്ങളിലും 377 വിവിധ ജനുസ്സുകളിലും ഉൾപ്പെട്ട 529 സസ്യ വർഗ്ഗങ്ങളെ കണ്ടെത്തുകയുണ്ടായി. ഇതിൽ 527 എണ്ണം സപുഷ്പികൾ അല്ലെങ്കിൽ ആവൃത ബീജികളുടേയും, രണ്ടെണ്ണം അപുഷ്പികൾ അഥവാ അനാവൃത ബീജികളുടേയും ഗണത്തിൽ പെടുന്നവയാണ്. 181 എണ്ണം ചെറുസസ്യങ്ങളും, 119 കുറ്റിച്ചെടികളും, 74 എണ്ണം വള്ളിച്ചെടികളും 155 എണ്ണം വൃക്ഷങ്ങളുമാണ്. സസ്യ വൈവിധ്യവും,ബാഹുല്ല്യവും ഏറ്റവും കൂടുതൽ ഉള്ളത് മണ്ണാർക്കാട് താലൂക്കിലെ തച്ചനാട്ടുകര ഗ്രാമപഞ്ചായത്തിൽ ഉൾപ്പെടുന്ന അത്തിപ്പറ്റമന നാഗകന്യാ ക്ഷേത്രത്തിലും, ഏറ്റവും കുറവ് ചിറ്റൂർ താലൂക്കിൽ ഉൾപ്പെട്ട കൊടുവായൂർ ഗ്രാമപഞ്ചായത്തിലെ പുന്നക്കോട് സർപ്പക്കാവിലുമാണ്. ഐക്യരാഷ്ട്ര സഭയുടെ പ്രകൃതി സംരക്ഷണത്തിനുള്ള സംഘടനയുടെ വംശനാശ ഭീഷണി നേരിടുന്ന സസ്യങ്ങളുടെ പട്ടികയിൽ ഉൾപ്പെടുന്ന 28 സസ്യങ്ങളും, പ്രാദേശികമായത് അഥവാ തദ്ദേശീയമായത് എന്ന ഗണത്തിൽ വരുന്ന 39 സസ്യങ്ങളേയും മേൽ പ്രസ്താവിച്ച 70 കാവുകളിൽ നിന്നും പഠനത്തിൽ കണ്ടെത്തി. ലഭ്യമായ 529 സസ്യ വർഗ്ഗങ്ങളിൽ 303 എണ്ണം വിവിധങ്ങളായ രോഗങ്ങളുടെ ശമനങ്ങൾക്കായി അയുർവ്വേദം, സിദ്ധവൈദ്യം, പരമ്പരാഗത നാട്ടുവൈദ്യം എന്നീ ചികിത്സാ രീതികളിൽ ഉപയോഗിച്ചു വരുന്നതായി മനസ്സിലാക്കുകയുണ്ടായി. 122 സസ്യങ്ങൾ അധിനിവേശ സസ്യങ്ങളിലോ വൈദേശികാഗമന സസ്യങ്ങളിലോ ഉൾപ്പെട്ടിരിക്കുന്നു. സർപ്പങ്ങളാണ് കാവുകളുടെ ഉടമയുടെ സങ്കല്പത്തിലുള്ള ദേവത എങ്കിലും കാരണവർ, മൂത്താർ, തെക്കൻ പറങ്ങോടൻ, ഭഗവതി, ഗുരുനാഥൻ തുടങ്ങിയ ദേവതാസങ്കല്പങ്ങളും പാലക്കാടൻ കാവുകളിൽ കണ്ടു വരുന്നുണ്ട്. 'ചിങ്ങൻ ചിറ പ്രകൃതി ക്ഷേത്രം' എന്നറിയപ്പെടുന്ന ചിറ്റൂർ താലൂക്കിലെ കൊല്ലങ്കോട് ഗ്രാമപഞ്ചായത്തിലെ ഏകലവ്യാശ്രമം കറുപ്പസ്വാമി ക്ഷേത്രത്തിലെ ശിവാവതാരമായ കറുപ്പസ്വാമി കേരളത്തിലെ മറ്റു കാവുകളിൽ നിന്ന വ്യത്യസ്തമായ ഒരു ദേവതാ സങ്കല്പമാണ്. പാലക്കാട് ജില്ലയിലെ അതിർത്തി ഗ്രാമങ്ങളിലെല്ലാം തമിഴ് സംസ്കാരത്തിന്റെ ഭാഗമായ ആചാരാനുഷ്ഠാനങ്ങൾ പ്രകടമാണ്. സർപ്പം തുള്ളൽ, സർപ്പബലി, സർപ്പപൂജ, നൂറും പാലും, പൊന്നിൻ പൂവ്, പുള്ളുവൻപാട്ട് തുടങ്ങിയ അനുഷ്ഠാനങ്ങൾ കാവുകളിൽ കണ്ടുവരുന്നു. ശക്തമായ വിശ്വാസങ്ങളുടെ പിൻബലത്തിൽ സംരക്ഷിക്കപ്പെട്ടിരുന്ന പാലക്കാട് ജില്ലയിലെ ഭൂരിഭാഗം കാവുകളും വനനശീകരണം, അധിനിവേശ സസ്യങ്ങളുടെ വ്യാപനം, ഭൂമി തരം മാറ്റൽ, കെട്ടിടങ്ങളുടേയും ക്ഷേത്രങ്ങളുടേയും നിർമ്മാണം, പാതകളുടെയും, വൈദ്യുത സംവിധാനങ്ങളുടേയും നിർമ്മാണം തുടങ്ങിയ നിരവധി കാരണങ്ങളാൽ നാശോന്മുഖമായിക്കൊണ്ടിരിക്കുന്നു. ഈ ആപത്തിൽ നിന്നും പാലക്കാട് ജില്ലയിലെ സംരക്ഷിക്കേണ്ടതും പുതുതലമുറക്ക് കൈമാറേണ്ടതും അത്യന്താപേക്ഷിതമാണ് എന്ന് മനസ്സിലാക്കി സർക്കാർ സംവിധാനങ്ങൾ 'ഉപഗ്രഹ സംരക്ഷണ' മാതൃകയിലുള്ള പദ്ധതികൾ ആവിഷ്കരിക്കേണ്ടതുണ്ട്.

Dedicated to,

Those who fighting against injustice and neglect.

To the experiences I never expected and the paths were redirected.

To the friends and family I found along the way.

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ABBREVIATIONS

ABK	Aakkaparambil Sree Bhagavathi Kshethram
AKK	Azhakappathukavu
AKR	Anakkara Gramapanchayath
AKV	Aachath kavu Vavanoor
ALT	Alathur
ANK	Athippattamana Nagakanyaka Kshethram
ANR	Alanellur Gramapanchayath
ASK	Ambalathu Sarpakavu
ATK	Azhchathu Tharavattukavu
CKV	Charakumalayil Kavu
CR	Critically endangered
CSK	Cherukadu Sarpakkavu
CSS	Chingath Sarpakavu
CST	Cholakkavu Shivakshethram
CSY	Chalissery Gramapanchayath
CTR	Chittur
CTV	Cholayil thazhathu veluthankavu
CTK	Charakumalayil Tharavattukavu
CU	Cultivated
CVA	Chalavara Gramapanchayath
ECY	Elavenchery Gramapanchayath
EKK	Ekalavyasramam Karuppaswamikshethram
EKT	Erattukoothan Tharavattukavu
EN	Endangered
EPN	Ethanur Pandalangat Nagakavu
EX	Exotic
Fl.	Flower
Fr.	Fruit
GVK	Govindhapuram Vishnu Kshethram
Ha	Hectar
IUCN	International Union for Nature and Natural resources
IVI	Importance value index
KA	Karnataka
KDB	Kodumbu Gramapanchayath
KDI	Kannadi Gramapanchayath
KDK	Kandayilkavu
KGD	Kollengode Gramapanchayath
KL	Kerala
Km	Kilometre
KMK	Kothelamuthappan Kavu
KMK	Karippaman Tharavattukavu
KMN	Kizhakkemundarathu Nagakavu

KND	Kongad Gramapanchayath
KNK	Kundinvadakkethil Kavu
KNT	Kunnathu Tharavattukavu
KPB	Koramparambu Sarpakkavu
KPM	Koppam Gramapanchayath
KPS	Kundupanlliyalil Sarpakavu
KPT	Karippadathu Tharavattukavu
KPZ	Kanjirappuzha Gramapanchayath
KSY	Keralassery Gramapanchayath
KTK	Kallingal Tharavattukavu
KTN	Kizhakkekkara Tharavadu Nagakavu
KTP	Katambazhipuram Gramapanchayath
KTR	Kuthanur Gramapanchayath
KTY	Kottayi Gramapanchayath
KVK	Kariyamkodu Vatukasamudayam
KVP	Kannadi Variyam Pambumkavu
KVR	Koduvayur Gramapanchayath
KVS	Kavassery Gramapanchayath
KYS	Kariyattin Sarpakkavu
LC	Least concern
LPR	Lakkidi Perur Gramapanchayath
m	Metre
MDK	Mandakathinkal Kudumbakavu
MKD	Mannarkkad
MLK	Melarkode Gramapanchayath
MMT	Musaliyathu Melengadi Tharavattukavu
MNK	Madathody Nagakavu
MTL	Muthuthala Gramapanchayath
MVK	Meluveettil Kavu
N/ED	Non endemic
NA	Native
NKN	Nagakanikagostam Nagakavu
NKP	Nagakshethram
NLY	Nellaya Gramapanchayath
NMR	Nenmara Gramapanchayath
NSY	Nagalassery Gramapanchayath
NT	Near threatened
NTK	Nottathe Tharavadu Nagakavu
OTP	Ottapalam
PAT	Parappur Tharavattukavu
PBK	Parakkattu Bhagavathi Kshethram
PKA	Poolakkalkavu
PKD	Palakkad
PKK	Pothirathukavu Kavuvattam
PKK	Poovakkottil Kavu

PKM	Pathirakunnathu Mana
PKS	Pacheerikkavu
PKT	Parathakkattil Tharavattukavu
PKY	Peringottukurussy Gramapanchayath
PLK	Pullanikkulangara Kutumbakavu
PMK	Perumarathinkavu
PNK	Punnakkodu Nagakshethram
PNS	Punnara Shiva Kshethram
PPM	Pullapallimanakavu
PPN	Pilappully Nagakavu
PPT	Pallipuram Pampinkavu
PSK	Panankurussy Shivashyleswara Kshethram
PTK	Pattiparambu Tharavattukavu
PTT	Pothirathu Tharavattukavu
PTV	Puthanpurakkal Tharavadu Veluthankavu
RBA	Relative basal area
RD	Relative density
RF	Relative frequency
SCM	Sreedharanchumarath Mana
SDK	Sree Durgadevi Kshethram
SHK	Sree Hariharakunnath Kavu
SVK	Sreevalsamkavu
TAK	Thiruvalathur Ayyappan kavu
TBK	Thiruthinmel Bhagavathi Kshethram
TKK	Thavalakkottil Kavu
TKT	Thozhukkattukizhakkekara Tharavattukavu
TN	Tamil Nadu
TTK	Thekkekara Tharavattukavu
TTN	Thuppala Tharavadu Nagakavu
TVK	Thiruvadikkunnath, Tharavadu
VGK	Vengalil Kavu
VKS	Veluthankavu
VTK	Tholanur valiathody kavu



Plate 1.
Borassus flabellifer L.
Black Palm / Doub Palm - 'The Icon of Palakkad'

Chapter I

INTRODUCTION

Sacred groves, revered forest patches dedicated to various deities, particularly Serpentine Gods, hold profound significance in Kerala. Associated with temples or families steeped in religious tradition, these groves vary in size and vegetation, each imbued with unique spiritual and ecological importance. Acting as vital mechanisms for in situ conservation, they are safeguarded by both religious reverence and ecological awareness.

These sanctuaries, recognized as conserved forest patches or protected areas, serve as cultural landmarks deeply embedded in the fabric of certain communities (Bakht and Collins, 2016). Local inhabitants take pride in preserving these sacred spaces, adhering to strict customs and rituals that underscore respect and purity. For instance, the tradition of entering barefoot symbolizes reverence and cleanliness, reinforcing the sanctity of the groves and ensuring their spiritual and ecological vitality.

Beyond their cultural and spiritual significance, sacred groves play a crucial role in ecological preservation (Dudley and Higgins-Zogib, 2012). Serving as biodiversity reservoirs, they harbor diverse plant and animal species, acting as crucial habitats for their survival.

Believed to be inhabited by deities or spirits, the protection of sacred groves is deemed essential for maintaining harmony between humanity and the natural world. They epitomize the interconnectedness of humans and nature, advocating for sustainable practices and conservation efforts. These groves not only embody the cultural and spiritual beliefs of the community but also serve as vital ecological hubs, sheltering endangered species, preserving rare flora, and contributing to overall biodiversity conservation.

In Palakkad district, sacred groves, known as 'Pambum kavu,' 'Sarpakkavu,' or 'Veluthan Kavu,' reflect cultural variations from west to east. Managed primarily by private families like 'Tharavadu,' their numbers are relatively limited compared to other Kerala districts. Unique deities such as Karuppaswami, revered in Ekalavyasramam Karuppaswami Kshethram,

characterize the spiritual landscape, with 'Moothar' and 'Karanavar' among the distinct guardians of these sacred spaces.

The district's close affinity with Tamil Nadu influences its cultural practices, mirroring Tamil traditions in the rituals observed within the eastern groves. Despite historical religious hurdles, governmental initiatives have gradually shifted custodial mindsets, allowing for the exploration of these sacred sites. However, comprehensive investigations into these sacred groves remain elusive, hindered by lingering religious and caste-related challenges.

This research is a comprehensive study on the floristic diversity of the sacred groves in Palakkad district. The various aspects like ecological phytosociological and cultural aspects related to this biodiversity-rich conserved forests are also dealt in this work.

Taxonomy is a scientific discipline dealing with the classification, names, and description of all types of living organisms, including plants. Ecology involves studying organisms and their interactions with the environment, illustrating the relationships between living things and their habitats. Phytosociology, or plant sociology, is a specialized study focusing on specific groups of plants found together.

Palakkad is one of the 14 district in Kerala located in the Coordinates: 10.775° N 76.651° E. with a total area of 4,480 sq. km(1,730 sq. mi). About 1,360 sq. km (530 sq. mi) of land is covered by forests. Most parts of the district fall in the midland region (elevation 75–250 m or 246–820 ft), except the Nelliampathy-Parambikulam area in the Chitturtaluk in the south and Attappadi-Malampuzha area in the north, which are hilly and fall in the highland region (elevation > 250 m or 820 ft). The district is blessed with many small and medium rivers, which are tributaries of the Bharathapuzha River. (https://spb.kerala.gov.in/en/palakkad, kerala state planning board).

Nestled within the lush expanse of Palakkad district in Kerala, sacred groves emerge as enigmatic ecosystems, culturally revered and ecologically rich. This

chapter establishes the foundation for an in-depth exploration of the taxonomical, ecological, and phytosociological dimensions of these sacred landscapes, enduring as repositories of biodiversity and cultural heritage.

1.1. Background

The study delves into the significant cultural and ecological importance of sacred groves in the southern region of Kerala, locally known as "kavus." These groves have been cherished for ages, serving not only as religious sanctuaries but also as vital refuges for the region's distinctive biodiversity.

1.2. Historical and Cultural Context

Kerala's cultural fabric intricately weaves together the presence of sacred groves, manifesting as visible vestiges of pure natural beauty that have withstood the test of time (Sankar, 2020). Firmly embedded in religious beliefs, these groves form an unbreakable bond with Hindu temples, becoming an integral component of religious ceremonies and festivals. This study sheds light on the historical and cultural components of these sacred groves, emphasizing their critical function as guardians of cultural heritage (Mariappan *et al.*, 2022).

The investigation methodically examines the historical connections linking these groves to Kerala's cultural history, providing insights into traditions, practices, and societal norms that contribute to their ongoing relevance. Sacred groves, woven into the fabric of Kerala's cultural identity, emerge as more than physical locations; they are cultural treasure reservoirs. The study explores their vital role in local cultural practices (Debbarma *et al.*, 2020), highlighting their contribution to religious rituals and joyous celebrations. These groves preserve centuries-old traditions, acting as custodians of cultural history.

The study brings to light the customs, tales, and folklore associated with these groves, offering a nuanced understanding of their cultural value. It demonstrates the impact of these sacred sites on the collective identity of those who visit them (Ellis *et al.*, 2021). Additionally, the research illuminates the sustainable practices embedded in the customs surrounding sacred trees and

investigates their historical and cultural components. Grounded in a profound comprehension of the relationship between culture and environment, these methods provide important context for present debates about environmental stewardship and conservation. By emphasizing the significance of traditional knowledge in addressing contemporary ecological concerns, the research aims to establish connections between historical customs and current sustainability initiatives. The historical and cultural components of Kerala's sacred groves serve as living representations of a heritage that influences the present. This research seeks to unravel the complex tapestry of traditions, beliefs, and practices woven into the fabric of these sacred sites (Nayar, 2021), raising awareness of their role as guardians of cultural heritage.

1.3. Ecological Significance

The relevance of sacred groves in the Palakkad District extends beyond their religious significance, encompassing a crucial ecological role as a linchpin in the region's biodiversity. These groves act as sanctuaries for indigenous flora and fauna,

These groves provide a safe refuge for a plethora of native plant species, some of which are exceptionally uncommon or unique. This ecological aspect of the inquiry emerges as a thorough investigation, revealing the complexities of these ecosystems and emphasizing their critical role in conserving the great diversity of species (Sreelekha and Joy, 2021). Sacred groves emerge as biodiversity hotspots, housing an array of indigenous plant and animal species. The study systematically catalogs the diverse variety of plant species that seek sanctuary inside these groves, recognizing the critical role that these habitats serve in preserving the genetic diversity of local flora.

The presence of rare and indigenous plant species highlights the invaluable contribution of sacred groves to the Palakkad District's overall biodiversity. A biological treasure trove emerges inside the confines of these groves, holding plant species that are not only uncommon but, in some cases, indigenous to the region (Kumar and Kunhamu, 2021). The research delves into the characteristics

of these rare species, shedding light on their ecological importance and emphasizing the need for tailored conservation efforts. By highlighting the presence of such species inside sacred groves, the study underscores the critical need to maintain these ecosystems as a vital repository of botanical variety.

The ecological component of the research embarks on a mission to uncover the complicated web of relationships within sacred groves. This entails a detailed examination of the microclimates that exist within these ecosystems, providing insights into the localized climatic conditions that impact the development and survival of diverse plant species (Bilyaminu *et al.*, 2021). Furthermore, an analysis of soil composition becomes essential to understanding ecological processes, offering vital information for sustainable management and conservation initiatives.

The groves' critical function in protecting numerous species is central to the ecological story. Beyond providing habitat, these sacred landscapes aid in the conservation of plant species by promoting conditions favourable to their development and reproduction. The research looks at the processes that allow these groves to act as guardians, preserving the survival of varied flora (Gurusamy and Basil, 2021). This awareness is essential for advocating the preservation of natural ecosystems.

The ecological importance of sacred trees in the Palakkad District is portrayed as a narrative of conservation and symbiosis. These groves are not just historic relics but also living ecosystems that are inextricably linked to the health of local wildlife (Gills *et al.*, 2021). This research strengthens the case for recognizing and protecting these sacred groves as key contributors to the ecological resilience of the Palakkad District through a comprehensive examination of rare and unique species, ecosystem dynamics, and the preservation of diverse flora.

1.4. Floristic diversity assessmeant and documentation

The taxonomical element of this study is a thorough endeavor, focused on systematically documenting plant species living inside the worship groves of

Palakkad District. The research provides critical information for improved biodiversity management and conservation projects through rigorous taxonomic categorization and identification techniques.

The rigorous cataloging of the many plant species populating the prayer groves is at the core of the taxonomical aspect. Each species fits into the greater picture of the groves' floral landscape (Sobczyk and Jose, 2022). The project guarantees a thorough repository of knowledge by methodically recording and cataloging these plant species, which serves as a foundation for future research and conservation efforts.

The crux of this aspect is systematic taxonomic categorization, which provides a structured framework for organizing the abundance of plant variety inside the sacred groves. The study uses recognized taxonomic procedures to define and categorize each species, providing for a clear and standardized understanding of the botanical makeup.

This methodical methodology is the backbone of the study, providing a scientific lens through which to analyze and interpret the flora (Kumar *et al.*, 2023). Beyond the academic realm, taxonomic identification of plant species has substantial consequences for biodiversity management and conservation. The capacity to recognize and name each species supports targeted conservation initiatives. Conservationists and policymakers may design measures to fulfill individual requirements, assuring the preservation of the unique biodiversity encased in the worship groves, armed with a thorough study of the plant life within these sacred sites.

Taxonomic investigation provides a complete understanding of the variety and composition of flora, which serves as the basic underpinning for conservation initiatives. With this knowledge, conservationists may devise educated plans to protect the sacred groves' distinctive plant life (Sumesh *et al.*, 2020). The taxonomical aspect guarantees that conservation efforts are anchored on a sophisticated understanding of the botanical complexity of these ecosystems, from habitat preservation to species-specific treatments.

Finally, the taxonomical aspect of this work goes beyond mere recording. It is a vital component of a wider conservation story, providing the foundation for efficient biodiversity management. This research sets the path for focused and educated conservation measures, preserving the preservation of unique plant life imbedded in the sacred landscapes of Palakkad District, by methodically categorizing and identifying plant species inside the worship groves.

1.5. Phytosociological Insights

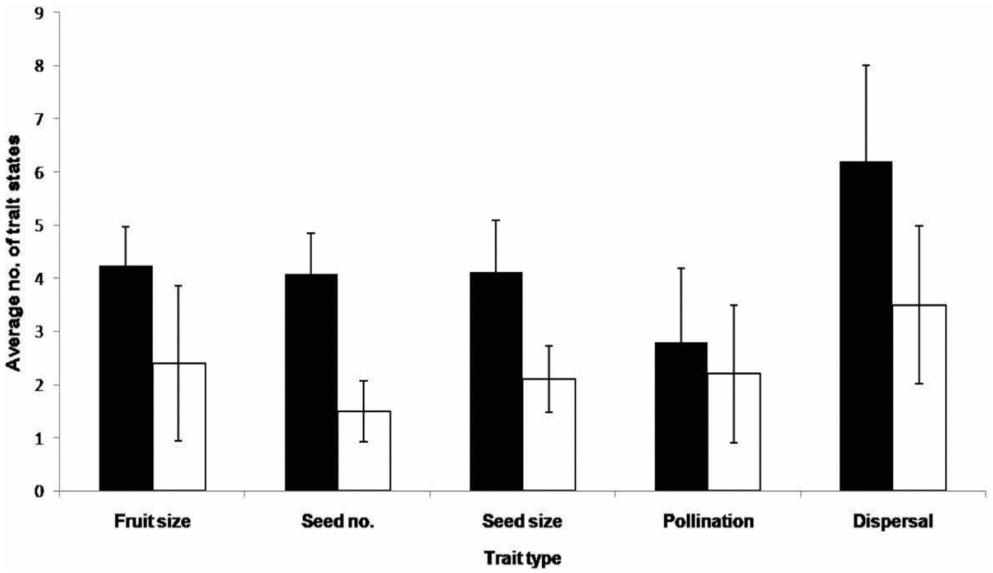


Figure 1: Functional Importance of Sacred grove Patches in the Altered Landscape of Palakkad Region, Kerala. (Rajasri *et al.*, 2017).

The phytosociological component of this research is a concerted attempt to understand the structural organization of plant communities thriving inside sacred groves. This aspect is critical for preserving the long-term sustainability of these respected landscapes by evaluating the spatial arrangement of different species and comprehending their unique functions within the ecosystem. The findings not only contribute to academic understanding but also provide critical information for developing conservation programs that respect and sustain the fragile biological balance of these habitats.

Investigating phytosociological complexities entails a detailed analysis of how plant communities are formed inside sacred groves (Roy *et al.*, 2022). This goes

beyond simple species identification, aiming to understand how various plants interact in terms of geographic distribution and ecological interactions. Unraveling the structural organization of these ecosystems provides a comprehensive view of the complicated processes at work.

The phytosociological component focuses on examining the spatial layout of various plant types. This spatial analysis reveals not only the physical distribution of plants but also their relationships and interdependence. Understanding how different species interact and affect one another is critical for anticipating ecosystem resilience to environmental changes and human influences.

The ultimate purpose of this research is to contribute to the long-term viability of sacred groves. The project seeks to provide significant insights that can influence conservation policies by unraveling ecological linkages and community dynamics. This understanding is especially important for ensuring that any intervention or management strategy maintains the delicate balance of these ecosystems, promoting an environment suitable for the continuous flourishing of varied plant groups.

The phytosociological study's findings serve as a platform for developing ecologically sensitive conservation measures. Recognizing the interdependence of plant communities allows conservation methods to be customized to preserve and increase the biodiversity of these sacred groves. This approach recognizes the need to protect not only individual species but the entire biological system that supports these distinctive landscapes.

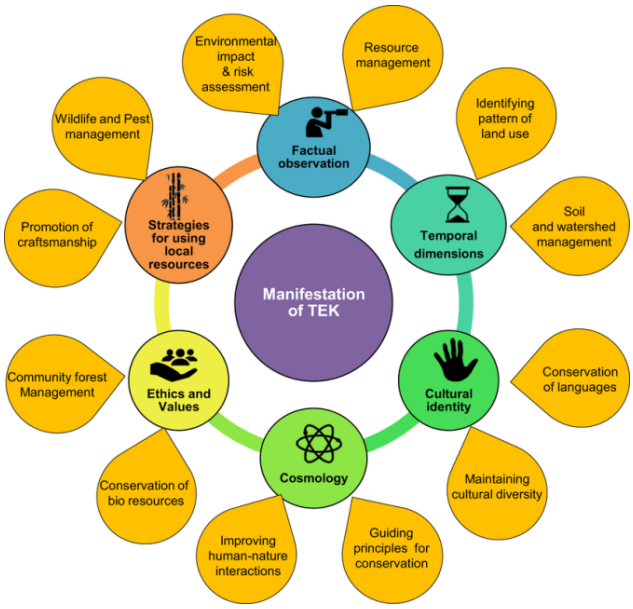


Figure 2: Traditional Ecological Knowledge

The significance of traditional ecological knowledge ingrained in the customs connected to sacred groves is acknowledged by the study (Hosen *et al.*, 2020). The research illuminates the dynamic relationship between local communities and these ecosystems by examining the complex interactions between humans and the natural world. To appreciate the cultural legacy and live in harmony with the environment, people must have this understanding.

The crux of this exploration lies in dissecting the complex interactions that have evolved over time, shaping the coexistence of people and their ecological surroundings (Alves *et al.*, 2022). By delving into traditional ecological knowledge embedded in the customs tied to sacred groves, the study seeks to uncover the wealth of insights and wisdom passed down through generations. Appreciating the cultural legacy woven into the fabric of these ecosystems is paramount.

The study recognizes that to foster harmonious cohabitation with the environment, individuals must possess a profound understanding of traditional ecological knowledge (Rath *et al.*, 2020). This knowledge not only serves as a

repository of ancient wisdom but also provides a holistic perspective that can guide contemporary practices.

1.6. Conservation Imperative

In this comprehensive study, the integration of taxonomy, ecology, and phytosociology emerges as a pivotal approach, emphasizing the urgency of safeguarding the sacred groves in Palakkad District. The research underscores the imperative of understanding these ecosystems from multiple scientific dimensions to develop a holistic knowledge base (Gulland *et al.*, 2022). By combining taxonomical documentation, ecological insights, and phytosociological understanding, the study not only seeks to unravel the intricacies of these sacred landscapes but also advocates for their sustainable conservation.

The conservation imperative articulated in the study goes beyond the ecological realm, acknowledging the intertwined nature of cultural and environmental heritage. It emphasizes that the protection of sacred groves is not merely an ecological necessity but a cultural responsibility. Preserving these groves becomes synonymous with preserving a rich tapestry of biodiversity and cultural history, ensuring that future generations inherit not only the spiritual significance embedded in these landscapes but also the diverse array of plant species that define them (Mukil, 2023).

As the research illuminates the interconnectedness of ecological and cultural aspects, it calls for a strategic and sustainable management approach. The findings stress the importance of implementing conservation measures that not only recognize the ecological roles of these groves but also acknowledge their cultural significance.

1.7. Socioeconomic Impact of Sacred Groves

The research delves into the socioeconomic dimensions of sacred groves, shedding light on their impact on local communities. Through meticulous exploration, it unveils the historical and contemporary economic activities

intricately linked to these sacred landscapes (Upadhyay *et al.*, 2019). Over time, these groves have played a multifaceted role in the socioeconomic fabric, acting as more than spiritual sanctuaries.

Historically, sacred groves have been integral to local economies, fostering activities that sustain livelihoods. Whether through traditional practices, such as gathering non-timber forest products, or engaging in cultural and religious tourism, these groves have contributed to the economic well-being of nearby communities. The study discerns how these economic activities have evolved, adapting to changing times and societal needs.

In the contemporary context, the research evaluates the economic significance of sacred groves in the Palakkad District (Parthasarathy and Babu, 2019). It explores whether these groves continue to support livelihoods, examining any emerging economic activities associated with them. By understanding the socioeconomic impact, the research not only enriches the comprehension of these sacred landscapes but also contributes valuable insights for sustainable development initiatives. This exploration acknowledges that the conservation and proper management of sacred groves not only safeguard cultural and ecological heritage but also sustain the socioeconomic resilience of the communities intertwined with these sacred sites.

1.8. Threats and Challenges Faced by Sacred Groves

The sacred groves of Palakkad District, while serving as cultural and ecological treasures, face a spectrum of threats that imperil their existence and integrity. One significant threat to sacred groves is anthropogenic pressure. Rapid urbanization, agricultural expansion, and industrial development encroach upon these natural habitats, leading to habitat fragmentation and degradation (Sharma and Kumar, 2021). The study discerns the nuanced impacts of human activities, investigating how land-use changes contribute to the decline of these sacred landscapes.

Deforestation emerges as a critical threat, driven by timber extraction, illegal logging, and agricultural expansion. The loss of tree cover not only disrupts the ecological balance within the groves but also diminishes their cultural and aesthetic value (Warrier and Warrier, 2019). The research analyzes the extent of deforestation and its cascading effects on biodiversity, emphasizing the urgent need for conservation interventions.

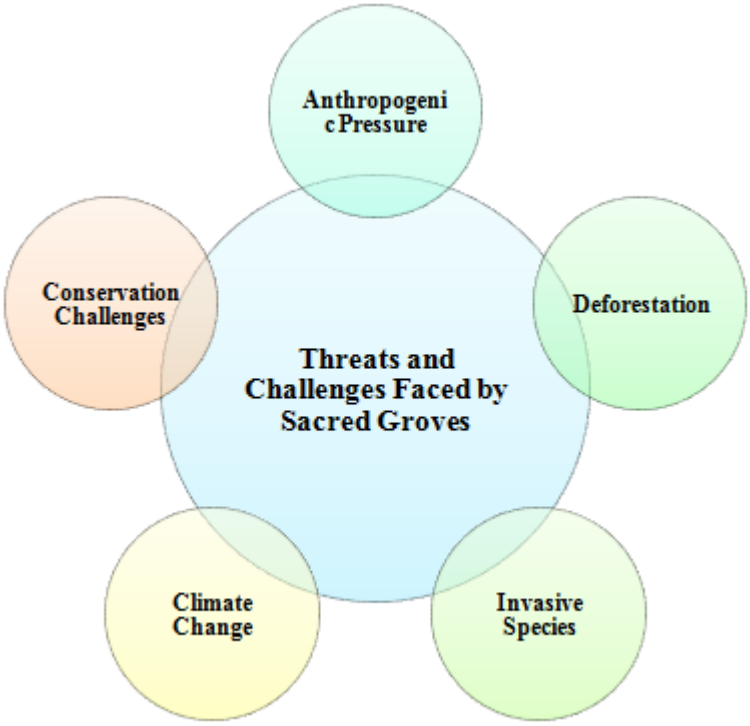


Figure 3: Threats and Challenges Faced by Sacred Groves

Another test is invasive species, which compromise the native flora inside the groves. The infringement of non-native plants disturbs the sensitive equilibrium of these ecosystems, possibly prompting the relocation of native species. The review dives into the elements of invasive species and their effect on the biodiversity of sacred groves (Jones *et al.*, 2023). The research sheds light on the potential consequences of invasive species and advocates for measures to mitigate their impact, ensuring the preservation of the unique plant communities within these sacred landscapes.

1.9. Environmental Change and Conservation Challenges

This exploration features the test of environmental change, representing a drawn-out danger to the soundness of these ecosystems. Adjustments in temperature and precipitation designs, as well as an expansion in outrageous climate occasions, can unfavorably influence the flora and fauna inside the groves. The review examines the particular environment-related weaknesses of sacred groves and investigates versatile systems for relieving these effects (Jeevan and Bonny, 2023).

Conservation endeavors face difficulties like restricted mindfulness and deficient local area commitment. The review examines how an absence of understanding about the natural and cultural value of these groves hampers conservation drives. It underlines the significance of local area association, supporting the dynamic cooperation of nearby occupants in the conservation of their sacred landscapes.

1.10. Role of Sacred Groves in Indigenous Knowledge Systems

The job of sacred groves in indigenous information frameworks is significant, filling in as storehouses of traditional practices, wisdom, and ecological understanding passed down through ages. This examination investigates the diverse commitments of these groves to the rich embroidery of indigenous information in the Palakkad Region. Inside sacred groves, indigenous networks have fostered a nuanced understanding of neighborhood ecosystems, cultivating feasible communications with nature (Rath and Ormsby, 2020).

The review enlightens traditional agricultural practices, restorative plant information, and asset the board procedures implanted in the texture of these groves. Indigenous information frameworks, profoundly entwined with the groves, offer experiences into the supportable utilization of normal assets, mirroring an agreeable conjunction with the climate. These groves go about as residing study halls where cultural practices, oral customs, and ceremonies are communicated from older folks to more youthful ages.

The exploration digs into the meaning of sacred groves as spaces for cultural schooling, stressing the significant job they play in molding the aggregate character of indigenous networks (MG and MG, 2019). Customs and functions directed inside these groves are profound as well as instructive, giving ecological wisdom that guides local area individuals in their collaborations with the normal world.

The concentrate further inspects the remedial and medicinal parts of indigenous information related to sacred groves. Local communities often rely on the diverse plant species within these groves for traditional healing practices. The research explores the specific plants used in traditional medicine, shedding light on the cultural significance of these practices and the ecological sustainability of medicinal plant harvesting.

Beyond medicinal knowledge, sacred groves contribute to indigenous cosmologies and belief systems (Chanda and Ramachandra, 2019). Rituals and ceremonies conducted within these sacred spaces reflect a deep understanding of the interconnectedness of all living beings. The research analyzes the cosmological aspects of indigenous knowledge, exploring how these beliefs influence conservation practices and environmental ethics within the community.

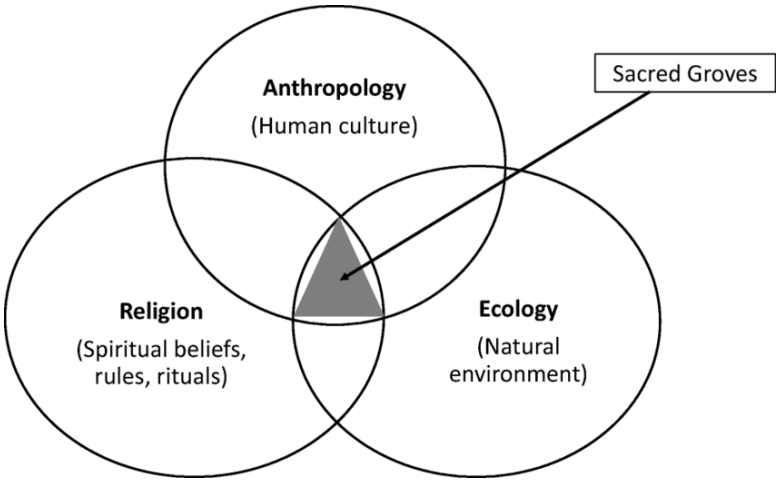


Figure 4: Various aspects of sacred groves.

This exploration highlights the challenge of environmental change, representing a long-term threat to the health of these ecosystems. Changes in temperature and precipitation patterns, as well as an increase in extreme weather events, can adversely affect the flora and fauna within the groves. The review examines the specific environmental vulnerabilities of sacred groves and explores adaptive strategies to mitigate these effects (Jeevan and Bonny, 2023).

Conservation efforts face challenges such as limited awareness and insufficient community engagement. The review examines how a lack of understanding about the natural and cultural value of these groves hampers conservation initiatives. It emphasizes the importance of community involvement, advocating for the active participation of local residents in the conservation of their sacred landscapes.

1.11. Comparison with Sacred Groves in Other Regions

This research undertakes a comparative study, placing the sacred groves of Palakkad District within the broader context of similar ecosystems both in India and globally. By examining the commonalities and distinctions, the study aims to elucidate the unique cultural and ecological characteristics that define the Palakkad sacred groves.

In comparison with sacred groves in different regions of India, the research delves into shared cultural practices, religious significance, and biodiversity conservation efforts (Ballullaya *et al.*, 2019). Understanding the variations in administration practices and rituals provides valuable insights into the diverse ways in which communities communicate with and preserve these sacred landscapes across the country.

On a global scale, the study situates the Palakkad sacred groves inside the bigger structure of sacred natural sites. By recognizing parallels with similar ecosystems around the world, the research contributes to a more extensive understanding of the universal importance of these sacred landscapes and

provides a basis for informed conservation strategies across diverse cultural and ecological contexts.

1.12. Legal Framework and Policies Related to Sacred Groves

This study provides an insightful outline of the legal framework and policies governing the conservation of sacred groves in Palakkad District. The research scrutinizes the existing legal protections set up to safeguard these exceptional ecosystems, featuring their significance in preserving both cultural and ecological legacy (Sankar, 2020). In the Indian setting, sacred groves frequently benefit from legal provisions that recognize their cultural and environmental significance. The study explores national and state-level regulations aimed at conserving biodiversity, with a specific emphasis on the security of sacred groves. These legal instruments play a crucial role in delineating the boundaries of these sacred landscapes and mitigating potential threats from land-use changes or development activities (Trivedi and Bharucha, 2023). The research critically examines the effectiveness of these legal frameworks, assessing their practical impact on the ground. By scrutinizing the enforcement mechanisms and implementation of conservation policies, the study gauges the extent to which existing regulations contribute to the sustained protection of sacred groves (Nayar, 2021). This evaluation provides valuable insights into potential gaps or challenges in the legal framework, illuminating recommendations for enhanced conservation strategies and policy improvements. Overall, the research aims to contribute to the ongoing discourse on legal safeguards for sacred groves, advocating for measures that ensure the long-term preservation of these culturally and ecologically significant landscapes.

1.13. Community Perceptions and Involvement

This research endeavors to unravel the complex relationship between local communities and sacred groves in Palakkad District. The investigation focuses on understanding how these communities perceive and engage with these sacred landscapes. By delving into the cultural, spiritual, and practical dimensions of local perceptions, the study aims to enlighten the significance of

sacred groves in the shared awareness of the local community. Additionally, the research conducts a detailed analysis of any community-based initiatives or involvement in the conservation efforts of these groves. This involves analyzing whether there are grassroots movements, traditional practices, or cooperative projects initiated by the community to participate effectively in the preservation of these ecosystems (Bielawski, 2021). Understanding the level of community involvement and the nature of initiatives sheds light on the potential synergies between traditional ecological knowledge and contemporary conservation practices. By synthesizing the perceptions and actions of the local community, the study contributes to a holistic understanding of the socioecological dynamics surrounding sacred groves (Mohanraj *et al.*, 2023). This insight is crucial for fostering community-driven conservation strategies that not only protect the ecological integrity of the groves but also honor and align with the cultural values held by the communities intertwined with these sacred landscapes.

1.14. Research Aim

The study aims to investigate in detail the ecological, phytosociological, and taxonomic aspects of sacred groves in the Palakkad District of Kerala, India. To acquire a more profound comprehension of the mind-boggling features of these ecosystems, the research delves into the bountiful plant diversity and symbolic significance of sacred groves. With an emphasis on scientific classification, it comprises the meticulous documentation of plant species present in the worship groves, providing essential data for the conservation of biodiversity. The ecological part aims to understand the perplexing snare of interactions that defines these groves, including the soil's composition, microclimates, and their role as refuges for a range of species. Besides, the phytosociological perspective looks at the roles and spatial configurations in the ecosystem with the end goal of understanding the structural composition of plant communities. The research aims to provide a comprehensive understanding of the sacred groves in the Palakkad District, with a focus on the urgent need for their protection and

sustainable management. This will help safeguard the groves' natural and cultural heritage for future generations.

1.15. Research Objectives

1. To comprehensively document the taxonomic diversity of plant species within sacred groves in Palakkad District, Kerala, aiming to create a comprehensive catalog for biodiversity documentation and conservation efforts.

2. To analyze the ecological dynamics of sacred groves, including microclimates, soil composition, and their role as habitats, with the aim of understanding the complex relationships within these ecosystems.

3. To investigate the phytosociological aspects of sacred groves, examining the functions and spatial arrangements of plant communities, providing insights into the structural composition of these ecosystems.

4. To assess the historical and cultural significance of sacred groves, unraveling their connections to religious practices, rituals, and their impact on the cultural character of local communities.

5. To archive and analyze traditional ecological information associated with sacred groves, highlighting the dynamic interactions between indigenous communities and these ecosystems, and exploring the role of this knowledge in contemporary practices.

6. To identify and evaluate the threats and challenges faced by sacred groves, both from anthropogenic activities and environmental factors, aiming to develop strategies for their sustainable conservation.

7. To conduct a comparative analysis with sacred groves in other regions of India or globally, aiming to understand the unique features of Palakkad's groves within a broader cultural and ecological context.

8. To critically assess the effectiveness of existing legal frameworks and policies related to sacred groves, aiming to provide recommendations for enhancing conservation efforts and sustainable management practices.

Research Questions

1. How can the taxonomic diversity of plant species within Palakkad's sacred groves be comprehensively documented to support biodiversity conservation?

2. What are the key ecological factors, such as microclimates and soil composition, influencing the dynamics of sacred groves, and how do they contribute to the overall health of these ecosystems?

3. How do plant communities function and spatially arrange within sacred groves, and what insights can this provide into the structural composition of these unique ecosystems?

4. What is the historical and cultural significance of sacred groves in Palakkad, particularly in terms of religious practices, rituals, and their impact on the cultural identity of local communities?

5. How is traditional ecological knowledge intertwined with the practices associated with sacred groves, and what role does this knowledge play in contemporary interactions with these ecosystems?

6. What are the primary threats and challenges faced by sacred groves, both anthropogenic and environmental, and how can strategies be developed to ensure their sustainable conservation?

7. How do the features of Palakkad's sacred groves compare with those in other regions of India or globally, and what insights can be drawn from these comparisons within a broader cultural and ecological context?

8. How effective are existing legal frameworks and policies in safeguarding sacred groves, and what recommendations can be made for enhancing conservation efforts and promoting sustainable management practices?

The exploration of these sacred groves becomes a compelling narrative, intricately weaving together cultural preservation, ecological understanding, and the imperative for biodiversity protection (Kadam and Kanchan, 2023). The overarching objective is to unravel the layers of importance embedded in these sacred landscapes, portraying their role not only as preservers of cultural identity but also as crucial ecosystems demanding preservation and meticulous management.

At the heart of this inquiry lies the aspiration to fathom the intricate connection between sacred groves and Kerala's rich cultural legacy. These groves, deeply entwined with religious practices and customs, transcend their physical existence to symbolize emblems of cultural preservation (Fleischhacker *et al.*, 2020). The project seeks to move beyond the superficial and peel back the layers of time to unveil how these landscapes have safeguarded cultural identity throughout history. By documenting the plant species within these groves through taxonomical investigations, the project aims to contribute to the conservation of not only the flora but also the cultural practices inseparably linked to these sacred areas (Manna and Roy, 2021). The journey takes a pivotal turn as it delves into the ecological realm. Beyond their religious significance, these forests act as sanctuaries for local flora and fauna.

The research, grounded in ecological understanding, endeavors to unravel the intricate web of connections within these ecosystems (Oyewo *et al.*, 2023). Exploring microclimates, soil compositions, and the distinct ecological functions these groves perform becomes imperative. Consequently, the study enriches not only the local ecological knowledge base but also contributes to the broader discourse on sustainable environmental practices. The pressing need for biodiversity protection forms a compelling rationale for this research. These sacred groves face unprecedented risks in an era of rapid expansion. The research underscores the urgency of safeguarding these ecosystems, recognizing their importance as havens for a variety of plant species, including rare or unique ones. Through systematic cataloging and classification of plant species, the taxonomical aspect of the research provides vital information for

effective biodiversity management and conservation (Jamieson *et al.*, 2023). This serves as the cornerstone for initiatives aimed at ensuring the resilience of these groves in the face of environmental changes and anthropogenic stressors.

The rationale behind this study extends well beyond academia; it responds to the urgent need to protect these sacred groves amidst a changing landscape of developmental activities. The research becomes a call to action as urbanization and land-use changes encroach upon these areas. It emphasizes the necessity of preserving natural ecosystems not only for their intrinsic value but also as indispensable components of sustainable development. The study's objective is to offer insights that will guide conservation strategies and strive to strike a balance between development and the preservation of these culturally and environmentally valuable areas.

1.16. Preservation of Cultural Heritage

The Palakkad District, nestled amid Kerala's cultural tapestry, is a living witness to the state's incomparable diversity. Sacred groves evolve as sanctuaries profoundly ingrained in religious practices and rites, expressing a cultural history that spans generations within its landscapes. The motivation for studying these groves from a taxonomic standpoint is deeply rooted in the preservation of this cultural legacy. The painstaking documentation of plant species inside these prayer groves becomes a critical way of conserving the botanical aspects inextricably related to the region's religious traditions.

The Palakkad District, with its historical significance, serves as a defender of Kerala's cultural riches (Costantino *et al.*, 2023). The sacred groves within its bounds, which are inextricably linked to religious practices, serve as a living repository of this cultural history. The research motivation stems from the awareness that these groves are more than just physical things; they are vessels bearing Kerala's cultural identity. The project aims to uncover the deep links between plant species and religious traditions through taxonomical examinations, adding to a fuller understanding of how these landscapes have

impacted the region's cultural story. The decision to explore these sacred groves from a taxonomic standpoint was deliberate and intentional.

It recognizes that the plants in these environments are more than just biological beings; they also have cultural importance (Bertolin, 2019). The systematic cataloging of plant species is a methodical approach to decoding the deep relationships between the botanical realm and religious traditions. The research intends to highlight the botanical subtleties that have had a role in developing and maintaining cultural practices throughout the ages by examining the taxonomic variety among worship groves. The study reason goes beyond academia; it is a dedication to the preservation of both plant aspects and religious traditions (Sumesh and Sudhikumar, 2021). The painstaking cataloging of plant species inside these sacred groves provides a physical link to Kerala's cultural heritage. The study adds to the documentation of practices that may be threatened or missed by maintaining this taxonomic information.

The preservation of these floral aspects is inextricably linked to the preservation of the religious traditions that are closely entwined with them. The research aims to contribute to the larger recording and maintenance of the cultural history reflected in these sacred spaces by identifying the taxonomic variety of plant species inside worship groves. Beyond the scientific endeavor, this study serves as a cultural heritage custodian, ensuring that the deep links between plant life and religious beliefs are not lost to the sands of time (Skublewska-Paszkowska *et al.*, 2022). The documenting of taxonomic variety becomes a witness to the linked nature of biological and cultural diversity, both of which are critical for the holistic understanding and preservation of the Palakkad District's distinctive character. The study of sacred trees in the Palakkad District from a taxonomic standpoint crosses academic bounds. It is a concerted endeavor to reveal and conserve the cultural history buried in these settings. By systematically recording plant species, the research becomes a custodian of Kerala's cultural diversity, adding to the larger story of how botanical aspects have formed and perpetuated religious traditions, ensuring that this cultural legacy is passed down to future generations.

1.17. Ecological Significance

The ecological component of research is motivated by a strong and pressing need: the desire to comprehend and maintain the natural environment that thrives within and around the sacred groves of Palakkad District. Beyond their religious importance, these trees develop as sanctuaries for indigenous flora and animals, playing an important part in the larger landscape of biodiversity protection (Rateesh, 2020). The ecological basis for this research derives from the pressing need to unravel the extensive web of relationships that exists throughout these ecosystems. The project intends to not only enhance understanding of these distinct ecosystems by investigating microclimates, soil compositions, and the special functions these groves play as habitats but also to promote methods for sustainable environmental management (Kalam *et al.*, 2020). Beyond their obvious religious importance, the sacred groves of Palakkad District are important components of the region's biological tapestry. These groves contribute significantly to the preservation of local biodiversity by acting as sanctuaries for indigenous flora and wildlife. The study rationale recognizes the essential role that these groves play in conserving and fostering a varied range of plant and animal species, some of which are uncommon or unique. The research recognizes these groves as essential assets to the larger conservation goal by moving the focus away from their religious responsibilities.

The ecological imperative reveals itself as a commitment to disentangling the convoluted snare of interactions that exists inside these sacred ecosystems (Rana *et al.*, 2019). The research delves into the microclimates that characterize these groves, meaning to understand the small changes in the climate that influence the development and survival of various plant species. The examination of soil composition is equally crucial, offering insights into the nutritional dynamics supporting the diverse flora within these ecosystems. Additionally, the study scrutinizes the specific ecological roles these groves play as habitats, providing refuge and sustenance for various species. The ecological understanding gained through this research contributes not only to

academic knowledge but also to the broader discourse on sustainable environmental practices.

The meticulous exploration of microclimates, soil compositions, and ecological functions is a methodical approach to deciphering the intricate relationships within these ecosystems (Oyewo *et al.*, 2023). By doing so, the study enriches local ecological knowledge while also providing valuable insights for sustainable environmental management. The urgent need for biodiversity protection is a driving force behind this ecological exploration. In an era of rapid expansion, these sacred groves face unprecedented risks, and the research emphasizes the critical role they play in serving as havens for various plant species, including those that are rare or unique. The ecological component of this study extends beyond the academic realm; it is a commitment to the preservation of the natural environment and its biodiversity, recognizing the interconnectedness of ecological and cultural aspects.

1.18. Phytosociological Understanding

The impetus for the phytosociological component of this research stems from a deep desire to understand the structural makeup of plant communities that thrive in the sacred groves of Palakkad District. The spatial arrangement of many species and their ecological roles are central to this investigation, representing the crux of a careful endeavor. The realization of the fragile balance that supports these ecosystems drives this phytosociological research. These research findings are not only important for academic knowledge but also for developing conservation programs that not only respect but actively contribute to sustaining this fragile balance (Rashid *et al.*, 2023). This insight, acquired from the phytosociological lens, serves as a cornerstone for guaranteeing the long-term survival of these precious plants.

At the heart of the phytosociological investigation is a profound desire to understand the structural harmony of plant communities inside sacred groves. This entails a thorough examination of how various species are spatially distributed, interacting, and living within the limitations of these ecosystems.

The research tries to identify the fundamental principles that regulate the structural constitution of these landscapes by peeling back the layers of ecological interactions. This comprehension is required for enjoying the delicate dance of biodiversity inside these sacred settings (Rather *et al.*, 2022). The phytosociological component focuses on the spatial organization of diverse plant species. This investigation extends beyond the obvious, looking into the patterns and interactions that govern how plants are dispersed among these ecosystems. The reasoning behind the phytosociological component goes beyond academic investigation. It serves as a practical foundation for developing conservation plans that actively contribute to the preservation of the delicate equilibrium observed within these sacred environments. The spatial layout and ecological roles of plant communities offer environmentalists and policymakers a blueprint (Selim *et al.*, 2021). These measures seek not just to protect particular species but also to develop circumstances that promote the overall health and resilience of the ecosystem. The phytosociological component's main purpose is to contribute to the long-term sustainability of these sacred environments. The research becomes a defender of the ecosystems' well-being by recognizing the delicate balance inherent in the structural structure of plant communities (de Souza *et al.*, 2022). The discoveries made during this investigation serve as a guiding principle for conservation efforts, emphasizing the need to actively preserve the unique biological balance that distinguishes these sacred groves (Dudipala *et al.*, 2023). This study's phytosociological component is a concerted effort to decipher the structural harmony of plant communities inside sacred groves. The observed spatial layout, ecological roles, and delicate balance become critical aspects in developing conservation measures.

1.19. Conservation Imperative

The fundamental reasoning of this study is deeply rooted in the conservation imperative. The Palakkad District, despite its cultural and ecological assets, is not immune to the pervasive effects of contemporary development activities (Gulland *et al.*, 2022). These actions pose a significant threat to the sacred

groves, which have long functioned as cultural and ecological havens. The complete understanding gained via taxonomic, ecological, and phytosociological research serves as the foundation for conservation initiatives. This research intends to advocate for the protection and sustainable management of these sacred groves by giving a critical understanding of their numerous features. In doing so, it strives to preserve the survival of these priceless landscapes in the face of changing land-use patterns and human practices (DeWoody *et al.*, 2022). The conservation imperative serves as a rallying point, encouraging proactive actions to safeguard the cultural and ecological legacy embodied in Palakkad District's sacred groves.

1.20. Local and Global Relevance

The outcome of this study has far-reaching implications that go far beyond the Palakkad District. Sacred groves, which serve as both ecological and cultural microcosms, are critical in solving global concerns, particularly biodiversity protection and cultural legacy preservation. The impulse for this research stems from its potential to not only help local conservation efforts but also to catalyze a wider, global discourse (Dominic, 2021). This study seeks to provide insight into the complex interaction that exists between cultural practices, ecological resilience, and sustainable development. It aspires to be a valuable participant in a larger global conversation by diving into the taxonomic, ecological, and phytosociological elements of sacred groves. The resulting insights are intended to connect with shared challenges and aspirations relating to the delicate balance of the environment, culture, and the quest for sustainable progress. In essence, the study seeks to transcend local boundaries by providing insights that are consistent with global interests. It aspires to contribute to the broader discourse on how communities worldwide can navigate the challenges of preserving their unique identities while fostering sustainable practices for the benefit of future generations by addressing the interplay between cultural heritage and ecological well-being (Abdurahiman *et al.*, 2022). The study rationale for the taxonomic, ecological, and phytosociological investigations on sacred groves in the Palakkad District emerges as a beautiful tapestry woven

with threads of cultural preservation, ecological knowledge, and conservation imperatives.

These sacred groves, which are profoundly interwoven in the region's cultural and biological fabric, represent more than just physical landscapes; they express a legacy that transcends regional boundaries. The importance of these trees goes far beyond the Palakkad District, providing insights that resonate in worldwide discussions about biodiversity and cultural heritage. By digging into taxonomic complexities, ecological dynamics, and phytosociological subtleties, the research serves as a light for understanding and actively contributing to the lasting heritage of these sacred environments (Radhakrishnan *et al.*, 2021). This study demonstrates the persistence of these groves in the face of cultural and environmental changes. It goes beyond comprehension, intending to be a catalyst for conservation initiatives that guarantee these precious places survive. As cultural and environmental debates expand, this research provides a nuanced viewpoint, calling for the preservation of not only the physical groves but also the delicate interaction of cultural traditions and ecological resilience. The research seeks to establish these sacred landscapes as living testaments to the interweaving tales of culture and nature through this collaborative effort.

1.21. Sacred Groves Impact

This study holds paramount significance in developing a profound understanding of critical issues associated with sacred groves. It aims to unravel the requirements of these groves, shedding light on their suitability and influencing decision-making for their preservation (Raja *et al.*, 2021). Focused on taxonomical, ecological, and phytosociological studies on sacred groves in Palakkad District, Kerala, the research delves into the ecosystem's characteristics. The background study provides historical and cultural context, emphasizing the groves' connection to Kerala's culture and Hindu temples (Rajesh *et al.*, 2020). The effort aims to illuminate the history and culture of the sacred groves, establishing a link between traditional knowledge, history, and cultural initiatives. The study strives to raise awareness of Kerala's unique

culture and cultural heritage, showcasing the interconnectedness of traditional knowledge with customs.

1.22. Sacred Groves as Biodiversity Hotspots

The research recognizes sacred groves as biodiversity hotspots crucial for conserving indigenous plant and animal species. By cataloging the variety of plant species within these groves, the study highlights their vital role in preserving genetic diversity and protecting rare and unique species (Roka, 2021). The research emphasizes the need to maintain these ecosystems as repositories of botanical diversity, advocating for their conservation as key contributors to ecological resilience.

1.23. Ecosystems

The ecological component of the research addresses challenges within these ecosystems, focusing on their role in conserving a diverse range of species (Warrier *et al.*, 2023). Sacred groves emerge as biodiversity hotspots, playing a critical role in preserving genetic diversity. The study underscores the importance of maintaining these ecosystems as vital repositories of botanical variety, advocating for their conservation as contributors to ecological resilience (Sreekumar *et al.*, 2020).

1.24. Taxonomical Understanding

The taxonomical element systematically documents plant species within the sacred groves, providing essential information for biodiversity management and conservation efforts (Ahmed *et al.*, 2023). The study ensures a comprehensive understanding of plant species, serving as a foundational resource for future research and conservation initiatives. The research offers critical insights into taxonomic processes, facilitating a standardized knowledge of the botanical makeup and supporting conservation planning (Nair *et al.*, 2023).

1.25. Phytosociological Understanding

The phytosociological component explores the structural makeup of plant communities within sacred groves, analyzing the relationships and interdependence between different species (Pandey *et al.*, 2021). It recognizes the need to protect not only individual species but also the entire biological system supporting the landscapes of Palakkad District. The research provides detailed insights into how plant communities are formed, offering valuable information for conservation strategies.

1.26. Traditional Ecological Knowledge

These groves are ecological strongholds. Apart from preserving the unique flora and fauna of the region, this conservatories act as cultural pillars for local communities by preserving their religious and cultural heritage. It delves into the complex interactions between humans and the natural world, providing insights into cultural practices and their impact on ecological well-being.

In essence, this research is not only a scientific endeavor but a call to action, advocating for the preservation of sacred groves as living testaments to the interwoven tales of culture and nature. It contributes to global discussions on biodiversity protection, cultural heritage preservation, and sustainable development.

1.27. Threats to Sacred Groves

The research emphasizes the necessity of understanding ecosystems through multiple scientific lenses, combining taxonomical documentation, ecological insights, and phytosociological understanding to establish a comprehensive knowledge base. Beyond identifying issues within sacred landscapes, the study advocates for their sustainable conservation (Prasad *et al.*, 2023). It recognizes the interconnectedness of ecological and cultural aspects, emphasizing the need for a strategic and sustainable management approach. The research highlights the threats faced by sacred groves in Palakkad District, Kerala, including changes in land ownership, land sales, and the impacts of land reforms. The practice of selling lands to individuals without faith in religious practices and

issues related to joint family systems contribute to the disappearance and shifting of these groves. Activities such as cattle grazing further endanger these unique grove species. Over-exploitation of resources and the pressures of land reforms pose threats to the environmental lands and their resources, jeopardizing the delicate balance of ecosystems (Parvathy *et al.*, 2023; Ahmed *et al.*, 2023).

1.28. Conservation Imperative for Sacred Groves

This research holds significant implications for the conservation of sacred groves in the Palakkad District of Kerala. Beyond their cultural and historical significance, sacred groves play a crucial role in conserving biological diversity. Acting as nurseries and storehouses of medicinal plants, including those used in Ayurveda, tribal, and folk medicines, these groves contribute to genetic diversity. The study emphasizes the environmental ecosystem of sacred groves, highlighting their role in soil and water conservation, particularly through ponds and streams adjacent to the groves. The conservation of sacred groves becomes imperative not only for environmental sustainability but also for supporting the water requirements of various animals and birds. Moreover, sacred groves enrich the soil through litter decomposition, recycling nutrients and contributing to a healthy ecosystem. In the face of diminishing forest cover, sacred groves emerge as essential components for maintaining ecological balance (Parvathy *et al.*, 2023).

1.29. Cultural and Historical Significance

The cultural and historical significance of sacred groves in Palakkad District is deeply ingrained in the tapestry of Kerala's heritage. These groves are not merely ecological entities but living testaments to the historical bond between the people and Hindu temples. They have become an integral part of Kerala's identity, shaping cultural practices and traditions over generations. The research aims to unveil the customs and practices embedded in the traditions of the region, emphasizing their continued relevance in contemporary times. Beyond ecological reasons, the study underscores the invaluable contribution of

sacred groves to Kerala's cultural heritage, highlighting the need for their preservation (Kaleka and Bali, 2020; Ezenweke and Nwachukwu, 2023).

1.30. Taxonomical Documentation for Conservation

The significance of taxonomical documentation for conservation cannot be overstated as it plays a crucial role in unravelling the intricate world of plant species within sacred groves. This research segment acts as a vital tool for systematically recording and categorizing the diverse botanical species found in the sacred landscapes of Palakkad District (Berkes, 2021). By offering a comprehensive understanding of each species through systematic classification, the study establishes a clear and standardized knowledge base regarding the botanical composition of these groves. This taxonomical documentation serves as the foundation for effective biodiversity management and conservation initiatives. The detailed insights obtained from this process provide a critical starting point for shaping conservation projects, guiding future research endeavours, and promoting sustainable environmental practices. The study ensures exhaustive information on the plant species residing within these sacred groves, empowering conservationists to develop targeted strategies for their protection (Rajasenan *et al.*, 2019). Furthermore, the significance of taxonomical studies extends beyond mere documentation; it lays the groundwork for fostering a deeper appreciation of the botanical diversity inherent in these ecosystems. By categorizing each species, the research contributes to a broader understanding of the groves ecological roles and aids in the identification of rare or endangered vegetation. Ultimately, taxonomical documentation becomes a catalyst for informed conservation efforts, emphasizing the need to preserve the diverse and remarkable plant species inside the sacred groves of Palakkad District.

1.31. Phytosociological Understanding

The Phytosociological Understanding segment delves into the complex structural organization of plant communities within the sacred groves of Palakkad District. This research part is instrumental in unraveling the

complexities of phytosociology, offering a detailed analysis of how plant communities are shaped, interact, and adapt within these unique ecosystems (Joseph *et al.*, 2019). By scrutinizing the physical distribution of plants, the study goes beyond surface-level observation, aiming to reveal the relationships and dependencies between different species. Phytosociology, in this context, serves as a critical lens through which the research explores how these plant communities respond to environmental changes and human influences. The adaptability of these communities is examined, providing valuable insights into their resilience and capacity to bounce back from ecological challenges. The significance of phytosociological understanding lies in its contribution to informed conservation strategies. Recognizing not only the individual species but also the intricate web of relationships within the entire biological system becomes imperative for preserving the landscapes of Palakkad District (Retnaselvam and Singh, 2019). This research not only enhances the scientific understanding of these ecosystems but also emphasizes the need for holistic conservation measures that address the dynamic interplay between various plant species. Ultimately, the phytosociological perspective enriches the broader comprehension of sacred groves, positioning them not only as repositories of biodiversity but as resilient and adaptive ecological entities crucial for environmental stability.

Chapter II

AREA OF STUDY

The present study was conducted on major selected sacred groves of Palakkad district, Kerala state. The Palakkad district one of the largest district of Kerala state covering an area of 4,480 km^2 (1,730 sq mi). It is located at the centre of Kerala.It is the largest district in the state since 2006. Palakkad is bordered on the northwest by the Malappuram district, on the southwest by the Thrissur district, on the northeast by Nilgiris district, and on the east by Coimbatore district of Tamil Nadu. Palakkad is known as "The granary of Kerala". Palakkad is the gateway to Kerala due to the presence of the Palakkad Gap or Walayar Gap, in the Western Ghats This gap determines the climate of the district. The 2,383 m high Anginda peak, which is situated in the border of Palakkad district, Nilgiris district, and Malappuram district in Silent Valley National Park, is the highest point of elevation in Palakkad district.

Out of the total area of 4,480 km^2 (1,730 sq mi), about 1,360 km^2 (530 sq mi) of land is covered by forests. Most parts of the district fall in the midland region (elevation 75–250 m or 246–820 ft), except the Nelliampathy-Parambikulam area in the Chittur taluk in the south and Attappadi-Malampuzha area in the north, which are hilly and fall in the highland region (elevation > 250 m or 820 ft). Attappadi valley of Palakkad district, along with the Chaliyar valley of the neighbouring Nilambur region in Malappuram district, is known for natural Gold fields, which is also seen in other parts of Nilgiri Biosphere Reserve.

The climate is pleasant for most parts of the year, the exception is the summer months. There is sufficient rainfall and it receives more rainfall than the extreme southern districts of Kerala. The district has many small and medium rivers, which are tributaries of the Bharathapuzha River. A number of Dams have been built across these rivers, the largest being the Malampuzha dam. The largest in volume capacity is the Parambikulam Dam in Bhavani River, which is a tributary of Kaveri River, also flows through the district. Kadalundi River has its origin in Silent Valley National Park. The Chalakkudy River also flows through district.

The district generally has a tropical humid climate with extreme hot season and seasonal rainfall. The hot season starts from February to May and it is followed by South West Monsoon. Palakkad district receives a total annual rainfall of around 7348mm. The rainfall in Palakkad District is not uniform. The variation is so high on the silent valley receives more than 7000mm rainfall whereas eastern part of Attappadi and Chittur receives only a meager 700mm rainfall. The major rainfall is received during June to September in the south west monsoon (71%). But the north east monsoon contributes only about 18%. It will receive a medium fall in the withdrawal of Monsoon during October and November. Then the climate changes from cold to dry.

Winter begins in December and lasts till February. Temperatures remain mild and conducive for outdoor activities. Humidity is higher during the monsoon period that is from June to September it is around 90% during this period. Most of the months through out the year the humidity is high during this monsoon hours. The wind direction is generally westerly from January to September and easterly to north easterly during the rest of the year. The average wind speed gap area is 14.4 kmph during south west monsoon and 4.5kmph during north east monsoon.

January to March records the maximum sun shine hours of more than 8 hours. The months of June to August records the minimum sunshine hours due to cloudy sky. Good sun shine hours are recorded in the months of January to March. The annual evaporation district is around 2010 mm with maximum evaporation of 230 mm during March/April. At Palakkad maximum temperatures ranges from 28.1^{o} to 40°. Whereas minimum temperature ranges from 22.1˚ C to 25.3˚ C. The average annual maximum temperature ranges from 32.3˚ C and average annual minimum temperature 23.4˚ C.

As per the revenue division Palakkad district have six taluks namely Pattambi, Ottapalam, Alathur, Chittur, Palakkad and Mannarkkad. It also includes 13 block panchayats, 88 Grama panchayats and seven municipalities namely

Palakkad, Chittur-Thathamangalam, Ottapalam,Shornur, Pattambi, Cherpulassery and Mannarkkad.

Soil type of Palakkad district mainly includes mainly Laterite soil in Pattambi, Ottapalam, Palakkad taluks. Hill soil in Mannarkkad, Alathur, Chittur Taluks, Alluvial soil and Black cotton soil in the region of chittur taluk and attappadi block.

Palakkad is known as the village of Black palms. the present Palakkad district is separated from Arabian sea by region of Malappuram and Trissur.. The western areas of Palakkad generally humid than the eastern areas. During summer season the wind current from Tamilnadu flow towards Palakkad through the Walayar gap. Due to this the major portions of the district become dry.

Paddy is the main crop and Musa, Maize, Vegetables are the second major crops. Cereal and Millet cultivation reinstated in Attappadi region due to the Initiative of state government. Sugar cane and cotton cultivation also found the region of Chittur and Attapadi. Agriculture and cattle rearing are the main source of income. Kanjikode region (near Walayar gap) of Palakkad taluk has been changed to an industrial area.

Sacred groves are randomly distributed throughout the district. Which may be vary from plains to forest regions. However the groves rarely seen in forest regions than plains. Sacred groves were selected on the basis on the basis of more than 5 cents. A total of 70 sacred groves are selected from Alathur, Chittur, Palakkad, Mannarkkad, Ottapalam, Pattambi taluks for the study. Name of sacred groves of the study area, its location, deity, taluk, panchayath, and approximate area in hectare are given in the table 1.

Table. 1. Name of sacred groves with Location, Deities, Taluk, Panchayath and Area in Palakkad district.

SACRED GROVES OF PALAKKAD DISTRICT					
Sl No	**Name**	**Area in hectare**	**Diety**	**Location**	**Panchayath**
ALATHUR TALUK					
1	Kariyamkodu Vatukasamudayam	0.03	Nagam	**N** 10⁰46'14.230 **E** 76⁰ 33'56.525	Kottayi
2	Koramparambu Sarpakkavu	0.04	Nagam	**N** 10⁰36.692 **E** 76⁰ 36. 49	Melarkode
3	Nottathe Tharavadu Nagakavu	0.04	Nagam	**N** 10⁰45'04.833 **E** 76⁰ 10'39.908	Peringotttukurussy
4	Parakkattu Bhagavathi Kshethram	10.12	Bhagavathi, Nagam	**N** 10⁰39'18.38" **E** 76⁰ 31'09.41"	Kavassery
5	Peringottukurussy Nagakshethram	0.04	Nagam, Sasthavu, Vettekkorumakan	**N** 10⁰45'47.771 **E** 76⁰ 31'06.600	Peringotttukurussy
6	Thiruvadikkunnath, Tharavadu	0.30	Nagam, Bhuvaneswery, Ayyappan	**N** 10⁰39'23.505 **E** 76⁰26'54.712	Puthukkode
7	Tholanur valiathody kavu	0.30	Nagam, Ayyappan	**N** 10⁰43'13.735 **E** 76⁰ 30'47.743	Kuthanur
	CHITTUR TALUK				
8	Ekalavyasramam Karuppaswamikshethram	1.92	Nagam, Karuppaswami, Shiva parvathi	**N** 10⁰ 34'44.801 **E** 76⁰ 43'01.789	Kollengode
9	Ethanur Pandalangat Nagakavu	0.10	Nagam	**N** 10⁰ 40.250 **E** 76⁰ 38.501	Koduvayur
10	Kizhakkemundarathu Nagakavu	0.20	Nagam, Bhadrakali, Durgadevi	**N** 10⁰35.119 **E** 76⁰ 38.185	Elavanchery
11	Nagakanikagostam Nagakavu	0.03	Nagarajavu	**N** 10⁰36.240 **E** 76⁰ 37.438	Nenmara
12	Pilappully Nagakavu	0.06	Nagam	**N** 10⁰ 39.456' **E** 76⁰ 41.727'	Vadavannur
13	Punnakkodu Nagakshethram	0.06	Nagam	**N** 10⁰ 39.642 **E** 76⁰ 38.306	Koduvayur
14	Thuppala Tharavadu Nagakavu	0.04	Nagam	**N** 10⁰ 39.659 **E** 76⁰ 38.750	Koduvayur
PALAKKAD TALUK					
15	Cherukadu Sarpakkavu	0.09	Nagam	**N**10⁰ 48' 22.002 **E**76⁰ 28'29.248	Keralassery
16	Cholayil thazhathu veluthankavu	0.03	Nagam	**N**10⁰ 51' 27.648 **E** 76⁰ 30' 03. 463	Kongad
17	Kannadi Variyam Pambumkavu	0.04	Nagam	**N** 10⁰44'24.017 **E** 76⁰ 37'37. 307	Kannadi
18	Kariyattin Sarpakkavu	0.04	Nagam, Bhagavathi, Gurunathan	**N** 10⁰ 50'29.527 **E** 76⁰ 28'51.591	Keralassery
19	Kizhakkekkara Tharavadu Nagakavu	0.09	Nagam, Bhagavathi, Ayyappan	**N**10⁰ 50' 39.948 **E** 76⁰ 29'54.428	Keralassery
20	Pattiparambu Tharavattukavu	0.03	Nagam, Bhagavathi, Kuttichathan	**N**10⁰ 49' 22.282 **E**76⁰ 28'28.848	Keralassery
21	Puthanpurakkal Tharavadu Veluthankavu	0.03	Nagam	**N**10⁰ 51' 24.760 **E** 76⁰ 29'45.582	Kongad
22	Thiruvalathur Ayyappan kavu	0.10	Chithrakoodam	**N** 10⁰ 44'43.813 **E** 76⁰ 41 17.364	Kodumbu

SACRED GROVES OF PALAKKAD DISTRICT					
Sl No	**Name**	**Area in hectare**	**Diety**	**Location**	**Panchayath**
MANNARKKAD TALUK					
23	Ambalathu Sarpakavu	0.10	Nagarajavu, Nagayakshi	**N** 10⁰ 56′27.613 **E** 76⁰ 19′33.283	Thachanattukara
24	Athippattamana Nagakanya Kshethram	0.20	Nagakanyaka	**N** 10⁰ 55 10.635 **E** 76⁰ 20′28.163	Thachanattukara
25	Azhchathu Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′28.084 **E** 76⁰ 19′33.558	Thachanattukara
26	Erattukoothan Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′26.478 **E** 76⁰ 19′33.062	Thachanattukara
27	Kallingal Tharavattukavu	0.02	Nagam, Moothaar	**N** 10⁰ 56′06.791 **E** 76⁰ 19′29.476	Thachanattukara
28	Karippadathu Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′27.455 **E** 76⁰19.′38.104′	Thachanattukara
29	Karuppaman Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′27.467 **E** 76⁰ 19′34.948	Thachanattukara
30	Kothalamuthappan Kavu	0.04	Nagam, Brahmarakshassu, Mahavishnu	**N** 11⁰00′02.910 **E** 76⁰ 30′27. 610	Kanjirapuzha
31	Kundupalliyalil Sarpakavu	0.03	Nagam	**N** 11⁰ 01′00.000 **E** 76⁰ 22′27.953	Alanellur
32	Musaliyathu Melengadi Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′26.236 **E** 76⁰19.′30.530′	Thachanattukara
33	Panankurussy Shivashyleswara Kshethram	0.10	Nagam	**N** 10⁰ 56′25.391 **E** 76⁰ 19′38.670	Thachanattukara
34	Pothirath kavu Kavuvattam	0.10	Nagam, Vasuki	**N** 10⁰ 56′25.386 **E** 76⁰ 19′38.669	Thachanattukara
35	Pothirathu Tharavattukavu	0.10	Nagam	**N** 10⁰ 56′25.457 **E** 76⁰ 19′32.634	Thachanattukara
36	Thiruthinmel Bhagavathi Kshethram	0.10	Nagam, Kodungallur bhagavathi, Vettekkaran	**N** 10⁰ 55 10.635 **E** 76⁰ 20′28.163	Thachanattukara
OTTAPALAM TALUK					
37	Azhakappathukavu	0.02	Nagarajavu, Karinagam, Anjanamaninagam	**N**10⁰ 53′ 33″ **E** 76⁰ 23′ 02″	Vellinezhi
38	Chingath Sarpakavu	0.02	Nagam	**N**10⁰ 53′ 59.312 **E**76⁰ 25′ 52.229	Sreekrishnapuram
39	Kandaayilkavu	0.02	Karinagam, Ananthamaninagam	**N**10⁰ 54′ 09″ **E**76⁰ 20′ 52″	Vellinezhi
40	Kunnathu Tharavattukavu	0.04	Nagam	**N** 10⁰45′43.106 **E** 76⁰ 28′54. 762	Lakkidi Perur
41	Madathody Nagakavu	0.03	Nagam	**N**10°49'13.9" **E**76°18'25.8"	Chalavara
42	Pacheerikkavu	0.02	Karinagam, Anjanamaninagam, Maninagam	**N**10⁰ 54′ 30.268 **E** 76⁰ 25′ 49.491	Sreekrishnapuram
43	Parappur Tharavattukavu	0.04	Nagam	**N** 10⁰46′14.250 **E** 76⁰ 27′37.098	Lakkidi Perur
44	Pathirakunnathu Mana	1.62	Nagam	**N** 10⁰ 50′ 38′′ **E** 76⁰ 16′ 42′′	Chalavara
45	Poovakkottil Kavu	0.04	Nagam	**N**10⁰ 52′ 08″ **E**76⁰ 17′ 10″	Nellaya
46	Pullapallimanakavu	0.02	Karinagam,	**N**10⁰ 52′ 52″	Vellinezhi

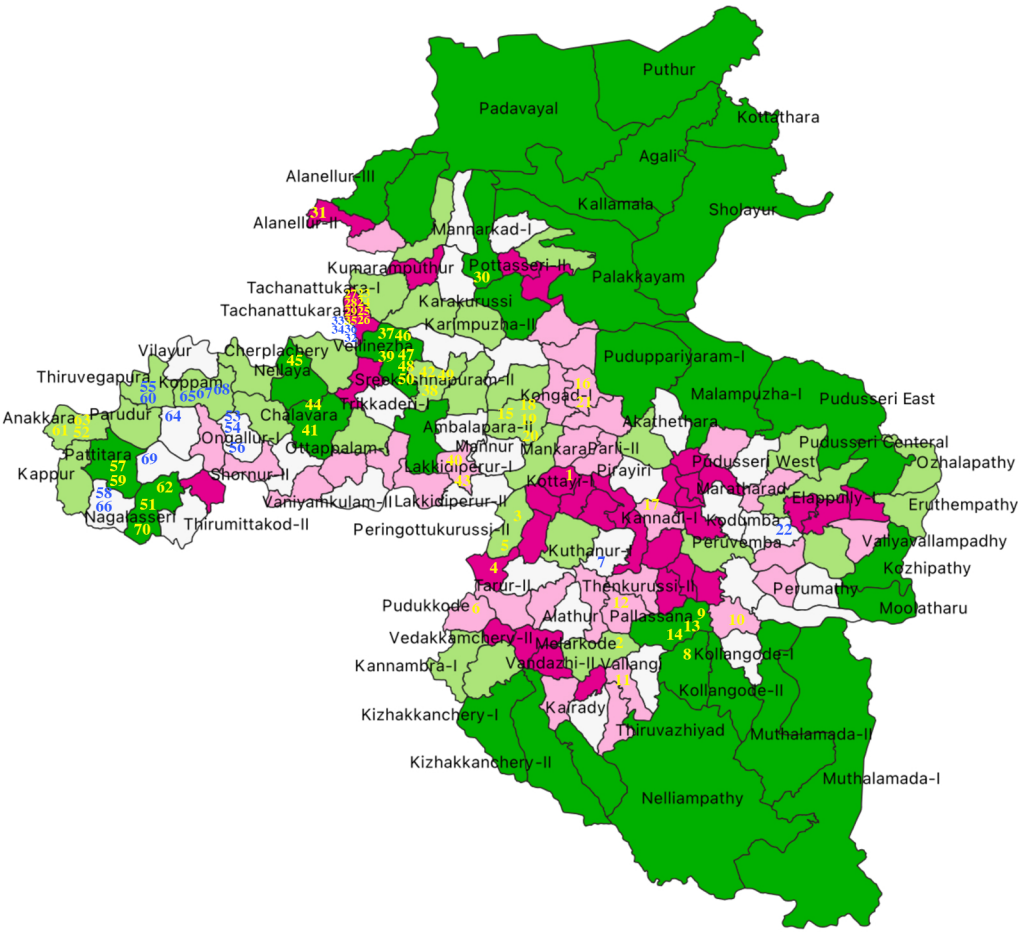
SACRED GROVES OF PALAKKAD DISTRICT					
Sl No	**Name**	**Area in hectare**	**Diety**	**Location**	**Panchayath**
			Nagarajavu	**E**76^0 21′ 29″	
47	Thavalakkottil Kavu	0.02	Maninagam, Anjanamaninagam	**N**10^0 53′ 54″ **E** 76^0 23′ 21″	Vellinezhi
48	Thekkekara Tharavattukavu	0.04	Anjanamaninagam	**N**10^0 52′ 30″ **E** 76^0 21′ 44″	Vellinezhi
49	Veluthankavu, Katambazhipuram	0.10	Nagam	**N** 10^0 52′59.140 **E** 76^0 27′07.563	Sreekrishnapuram
50	Vengalil Kavu	0.04	Karinagam, Maninagam	**N**10^0 54′ 23″ **E**76^0 21′ 13″	Vellinezhi
PATTAMBI TALUK					
51	AachathukavuVavanoor	0.02	Maninagam, Anjanamaninagam	**N** 10^0 45′ 11″ **E** 76^0 08′ 53″	Nagalassery
52	Aakkaparambil Sree Bhagavathi Kshethram	0.04	Nagarajavu, Nagayakshi, Karinagam	**N** 10^0 50′ 46″ **E** 76^0 02′ 37″	Anakkara
53	Charakumalayil Kavu	0.20	Nagarajavu	**N** 10^0 50′ 26″ **E** 76^0 13′ 49″	Vallapuzha
54	Charakumalayil Tharavattukavu	0.06	Nagarajavu, Nagayakshi, Karinagam	**N** 10^0 50′ 32″ **E** 76^0 13′ 56″	Vallapuzha
55	Cholakkavu Shivakshethram	0.80	Anjanamaninagam, Maninagam, Nagarajavu	**N** 10^0 51′ 37″ **E** 76^0 06′ 55″	Thiruvegappura
56	Govindhapuram Vishnu Kshethram	0.06	Nagarajavu, Nagayakshi	**N** 10^0 50′ 32″ **E** 76^0 14′ 03″	Vallapuzha
57	Kundinvadakkethil Kavu	0.08	Chithrakoodam	**N** 10^0 47′ 57″ **E** 76^0 05′ 19″	Pattithara
58	Mandakathinkal Kudumbakavu	0.06	Nagarajavu, Nagayakshi	**N** 10^0 43′ 46″ **E** 76^0 06′ 00″	Chalissery
59	Meluveettil Kavu	0.04	Maninagam, Anjanamaninagam	**N** 10^0 47′ 13″ **E** 76^0 06′ 42″	Pattithara
60	Pallipuram Pampinkavu	0.10	Nagarajavu, Nagakanyaka	**N** 10^0 51′ 25″ **E** 76^0 06′ 40″	Thiruvegappura
61	Parathakkattil Tharavattukavu	0.02	Maninagam, Karinagam	**N** 10^0 49′ 58″ **E** 76^0 03′ 12″	Anakkara
62	Perumarathinkavu	0.04	Maninagam, Anjanamaninagam	**N** 10^0 43′ 37″ **E** 76^0 07′ 20″	Nagalassery
63	Poolakkal kavu	0.03	Maninagam, Karinagam	**N** 10^0 50′ 24″ **E** 76^0 02′ 29″	Anakkara
64	Pullanikkulangara Kutumbakavu	0.10	Karinagam, Maninagam	**N** 10^0 48′ 42″ **E** 76^0 10′ 48″	Pattambi
65	Punnara Shiva Kshethram	0.60	Nagarajavu	**N** 10^0 52′ 03″ **E** 76^0 11′ 22″	Koppam
66	Shrivalsamkavu	0.03	Nagarajavu, Nagayakshi	**N** 10^0 45′ 10″ **E** 76^0 05′ 45″	Chalissery
67	Sree Durgadevi Kshethram	0.08	Nagarajavu	**N** 10^0 52′ 15″ **E** 76^0 11′ 35″	Koppam
68	Sree Hariharakunnu Kavu	0.20	Anjanamaninagam, Karinagam	**N** 10^0 52′ 03″ **E** 76^0 11′ 22″	Koppam
69	Sreedharanchumarath Mana	0.10	Nagarajavu, Nagayakshi, Karinagam	**N** 10^0 49′ 58″ **E** 76^0 09′ 53″	Muthuthala
70	Thozhukkattukizhakkekara Tharavattukavu	0.30	Maninagam, Anjanamaninagam	**N** 10^0 44′ 41″ **E** 76^0 07′ 13″	Nagalassery



Map 1. Kerala showing study area in Palakkad district



Map 2. Palakkad district with six taluks



Map 3. The study area of Palakkad district showing the location of 6 Taluks with 70 sacred groves

Chapter III:

REVIEW OF LITERATURE

Nature has been revered across different societies throughout history. One notably significant element in this regard is the concept of sacred groves. These groves hold immense importance within social, religious, and natural practices. The term "sacred groves" suggests that these forests are considered sacred due to their rich collection of valuable medicinal plants. The need to protect these groves has gained significant attention in recent times, as studies explore the reasons behind their conservation and strategies for safeguarding these unique and endangered plant species. Research efforts worldwide have focused on the religious, cultural, and scientific aspects of preserving sacred groves, aiming to contribute to global biodiversity conservation.

Exploration of sacred groves intersects with cultural heritage, ecological vitality, and biodiversity protection. These sacred trees emerge as living monuments to the delicate interplay between nature and culture within the landscapes of Palakkad District, Kerala. This overview of the literature dives into the rich tapestry of studies surrounding sacred groves, encompassing their historical origins, cultural relevance, and ecological aspects. These groves preserve vital biodiversity as stewards of distinct plant species, deeply intertwined into the fabric of religious practices and traditions that transcend centuries. The value of sacred trees transcends regional bounds, reverberating in global discussions about biodiversity protection and cultural heritage preservation. These groves, which are strongly engrained in Kerala's cultural character, serve as biodiversity hotspots and stores of traditional ecological knowledge. With the intrusion of modern construction activities, the sacred groves in Palakkad District suffer unprecedented challenges. Understanding their cultural, historical, and ecological components becomes critical for developing policies to assure their long-term protection. The major goal of this literature review is to thoroughly explore existing studies on sacred groves, offering insight into their biological richness, ecological dynamics, and cultural significance. The study attempts to highlight gaps and problems in the existing understanding of these ecosystems by critically analyzing previous findings.

It attempts to lay a solid platform for future study aimed at documenting and conserving the sacred trees in Palakkad District. The breadth of this literature review goes beyond a simple synthesis of current information. It aims to present a nuanced view of the interdependence of cultural practices, ecological resilience, and sustainable development in the setting of sacred groves. The review aims to promote a greater awareness of the delicate links between these groves and the people who appreciate them by navigating through the different materials accessible. Several significant topics and concepts will be covered within the literature to be reviewed. These include taxonomic records of plant species inside sacred groves, the ecological value of these habitats, and the cultural and historical ties that run through them. Traditional ecological knowledge and the problems that sacred trees face in the modern landscape will also be major subjects. By addressing these themes, the literature study aims to provide a complete knowledge of sacred groves that extends beyond their immediate physical qualities.

The developing narrative of this literature review starts on a compelling adventure across the realms of scholarly discourse, poised to unravel the profound and intricate layers of meaning delicately inscribed in the sacred groves of Palakkad District, Kerala. This intellectual investigation not only tries to synthesize current information but also to go beyond the confines of conventional thinking, diving into the deep complexity that constitutes these sacred ecosystems. The study establishes the framework for an excursion into the heart of sacred trees guided by cultural preservation principles. It recognizes these ecosystems as cultural heritage repositories, repeating the memories of previous generations. Furthermore, the tale unfolds with a dedication to sustainable cohabitation, noting the delicate balance necessary for these ecosystems to flourish against the shifting landscapes of contemporary problems.

3.1 Empirical studies

3.1.1 Introducing the Sacred Groves

Sacred groves are reserved for spiritual observance; they are places of refuge where biological diversity and cultural value coexist. These groves are distinguished by their holiness; religious or spiritual societies undertake rituals and rites there because they view the earth, its flora, and its fauna as sacred beings (Pazhoothundathil and Bailey, 2020). These natural areas have a certain air that encourages a deep connection between the sacred and the earthly, much like outdoor temples. Sacred groves are found all throughout the world and which reflect the diversity of human communities in terms of culture and religion. These groves continue to exist as a cross-cultural phenomenon, from the ancient forests of Japan to the hallowed landscapes of India and the sacred woodlands of Europe. Every sacred grove contains a unique story that is interwoven into the customs and beliefs of the area (Abraham and Oommen, 2023). These worldwide expressions highlight the common human tendency to seek a harmonious coexistence with the natural world and the divine, with designated natural areas serving as portals for spiritual encounters. Examining the historical origins of sacred groves is essential to comprehending their current relevance. Sacred groves have a long historical background; ancient documents, religions, and folklore all attest to their presence. Animistic traditions, in which everything in nature, including towering trees and meandering streams, is believed to be inhabited by spiritual entities, are the source of many sacred groves. These groves developed into treasured and guarded sacred environments over time, becoming essential to the religious rituals of many societies.

Sacred groves are naturally resilient since their maintenance frequently entails stringent taboos against any kind of exploitation or change. These groves have endured over the millennia because of the cohabitation of ecological and cultural values, providing refuge for biodiversity in the face of a constantly shifting environment (Menon, 2020). The historical background emphasizes

sacred groves' resilience while also emphasizing their capacity to adjust to changing circumstances. For instance, one of Kerala's oldest sacred groves, Madathody Naga Kavu, is a venerated 10-acre grove dedicated to snake worship and is located in Chalavara Gramapanchayath, Ottapalam taluk, Palakkad. A 6-acre forest in Pattambi taluk called Kolakkadavu Bhagavathy Kavu is well-known for its unusual architectural elements and is dedicated to the goddess Bhagavathy (Chandran, 2022). Located in the Thrithala taluk of Palakkad, Thrithala Bhagavathy Kavu is a five-acre shrine devoted to the goddess Bhagavathy. It holds an annual festival that attracts thousands of devotees. Sacred groves are places where the spiritual and ecological elements come together to provide a synergy between the material and immaterial. These sacred groves provide an enduring model for coexisting sustainably as people struggle with environmental issues and look for methods to get back in touch with the natural world (Kadam and Kanchan, 2023). A basis for understanding the rich tapestry of sacred groves each a monument to the continuing relationship between people, spirituality, and the natural world is acknowledging their historical origins and worldwide existence.

3.2 Cultural and Religious Significance

Sacred groves are important places with deep religious and cultural significance, where a multitude of customs and beliefs are intricately woven together (Chinnappan, 2019). This section explores the various ways that sacred groves influence cultural practices, serve as locations for religious ceremonies, and add to the collective cultural legacy.



Figure 5: Cultural and Religious Significance

Role of Sacred Groves in Cultural Practices: Sacred groves represent a living link between communities and their historical roots, serving as havens for cultural practices (Bha*t et al.*, 2023). These sacred grounds are frequently used as locations for intergenerational rituals, social meetings, and cultural events. These groves' natural surroundings offer a calm backdrop for a variety of cultural events, strengthening the bonds of community and promoting unity (Parvathy, 2023). Sacred groves are transformed into vibrant settings where cultural practices come to life through storytelling and traditional performances, helping to preserve intangible cultural heritage.

Religious Rituals and Traditions Associated with Sacred Groves: The sacred groves are essential to a community's spiritual identity because they are the center of many religious rituals and traditions (Parvathy, 2023). These groves frequently contain shrines, altars, or other sacred locations used for religious rituals. The customs carried out in these unspoiled environments are ingrained in the communities' belief systems and represent a sacred communion between humans and the divine. These groves' close proximity to places of worship adds to their significance and harmonizes spirituality and natural reverence (Mohan and Alex, 2021). Sacred groves become the sacred spaces where religious

traditions are performed through a variety of ceremonies, encouraging spiritual connectedness and continuity.

Sacred Groves as Cultural Heritage: Sacred groves provide as a physical link to the past and are important cultural heritage sites in addition to their obvious religious functions (Savinaya *et al*., 2022). These groves frequently contain old trees, unusual architectural features, and historically and culturally significant objects. Maintaining the authenticity of regionally distinct architectural styles and cultural activities depends on the preservation of these landscapes. Sacred groves serve as outdoor museums, showcasing the living legacy of local people via flora, animals, and buildings that have withstood centuries of cultural development (Pulicherla *et al., 2023*). Maintaining the range of cultural manifestations and making sure that future generations inherit the richness of their cultural inheritance depend on the recognition and protection of sacred groves as cultural heritage.

3.3 Ecological Importance

Honored for their spiritual and cultural importance, sacred groves are essential to ecological preservation (Suresh, 2020). Their role as hotspots for biodiversity, suppliers of essential ecosystem services, and repositories of conservation value are only a few of the many facets of their ecological significance.

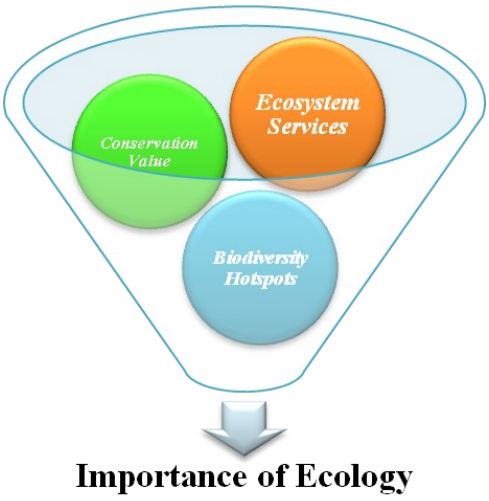


Figure 6: Importance of Ecology

Biodiversity Hotspots: Sacred groves serve as havens for a wide variety of plant and animal species, making them hotspots for biodiversity. These groves are vital repositories of genetic variation because they frequently support rare and endemic species of plants and animals. A rich tapestry of biodiversity is created by the seclusion and protection these habitats provide, which aid in the survival of uncommon and endangered species. Preserving sacred groves is closely linked to maintaining biological variety, guaranteeing the survival of rare species, and fostering general ecological diversity in the areas they call home.

Ecosystem Services Provided by Sacred Groves: Sacred groves offer vital ecosystem services that support the health of the surrounding human populations as well as the surrounding natural environment, in addition to their significance as hotspots for biodiversity (Suresh, 2023). The control of regional hydrological cycles is one of their most important roles. By serving as organic water tanks, these groves promote soil fertility, stop soil erosion, and preserve sustainable water sources (Muneeswaran and Udayakumar, 2022). Furthermore, the variety of plants found in these habitats supports environmental health by regulating the climate and purifying the air. Sacred groves frequently function as essential pollinator habitats, enhancing local agricultural output. Acknowledging the diverse range of ecosystem services provided by sacred groves highlights their significance in maintaining environmental equilibrium.

Conservation Value of Sacred Groves: Sacred groves have conservation importance that goes beyond their direct ecological benefits (Trivedi and Bharucha, 2023). These groves serve as living labs for researchers studying and comprehending natural ecosystems. They offer important insights into ecological dynamics, species interactions, and adaptation strategies through methodical investigation and recording. Sacred groves provide especially interesting study topics because of their distinctive microclimates and soil compositions (Padmakumar *et al*., 2021). By providing useful information that may guide sustainable management methods and regulations, the preservation

of these groves serves as a cornerstone for larger conservation programs. Acknowledging and preserving sacred groves' conservation importance helps communities and policymakers achieve the larger objectives of biodiversity protection and ecological resilience.

3.4 Taxonomic Studies on Plant Diversity

Taxonomic research reveals the complex world of plant variety found in sacred groves, providing a thorough knowledge that goes beyond simple cataloging (Rajilesh, 2019). This section covers the methodologies used in taxonomic studies conducted inside sacred groves, discusses the importance of taxonomic documentation, and emphasizes the significant contributions that these studies provide to the conservation of biodiversity.

Significance of Taxonomic Documentation: A key component of the scientific investigation of plant variety in sacred groves is taxonomic recording. A systematic foundation for comprehending the botanical composition of these distinct ecosystems is provided by taxonomy studies, which methodically list and categorize plant species. It's important to name and identify particular species, but it's also important to have a common knowledge base (Ojo *et al*., 2022). With its comprehensive record, scholars, environmentalists, and policymakers may get a fundamental knowledge of the plant variety present in sacred groves. It serves as the foundation for further studies, planning for conservation, and the creation of sustainable management techniques.

Methods for Taxonomic Studies in Sacred Groves: The diversity and interdisciplinary nature of the methodologies used in taxonomic investigations within sacred groves is a reflection of the intricate nature of these ecosystems (Whiten, 2021). Conventional fieldwork is gathering plant specimens in a methodical manner and carefully examining them for morphological traits. Modern methods like DNA barcoding and molecular biology help identify species more accurately, especially when it's difficult to distinguish between them visually (Ojo and Fauzi, 2020). These investigations are more effective when ecologists, taxonomists, and local communities work together. Taxonomic

study frequently incorporates traditional ecological knowledge, which offers insights into the regional names, applications, and cultural value of plant species. Taxonomic research in sacred groves become comprehensive activities that capture the richness of plant variety from several viewpoints by integrating traditional and scientific methodologies.

Contributions to Biodiversity Conservation: Taxonomic research conducted inside sacred groves significantly advances biodiversity conservation on a number of fronts (Waronker, 2019). The comprehensive understandings derived from these investigations form the basis for efficient management of biodiversity. By knowing the location, quantity, and ecological importance of different plant species, conservationists can create focused plans to preserve these groves. Taxonomic studies aid in the selection of priority species for conservation efforts by identifying uncommon or endangered plants. Furthermore, the information produced by taxonomic documentation facilitates the tracking of changes in plant variety over time, enabling the implementation of adaptive conservation strategies (Jeychandran, 2021). The incorporation of taxonomic data into more comprehensive conservation efforts guarantees that sacred grove preservation transcends symbolic activities to informed and useful actions. For example, Floristic Composition and Ethnobotanical Practices of the Sacred Groves of Nemmara, Palakkad District, Kerala, documented a total of 70 plant species belonging to 36 families in Punikkolkavu sacred grove and 41 plant species belonging to 22 families in Chirakkakavu sacred grove (Lakshminarayanan, 2020.). The study also investigated the ethnobotanical practices associated with these plants.

3.5 Ecological Dynamics

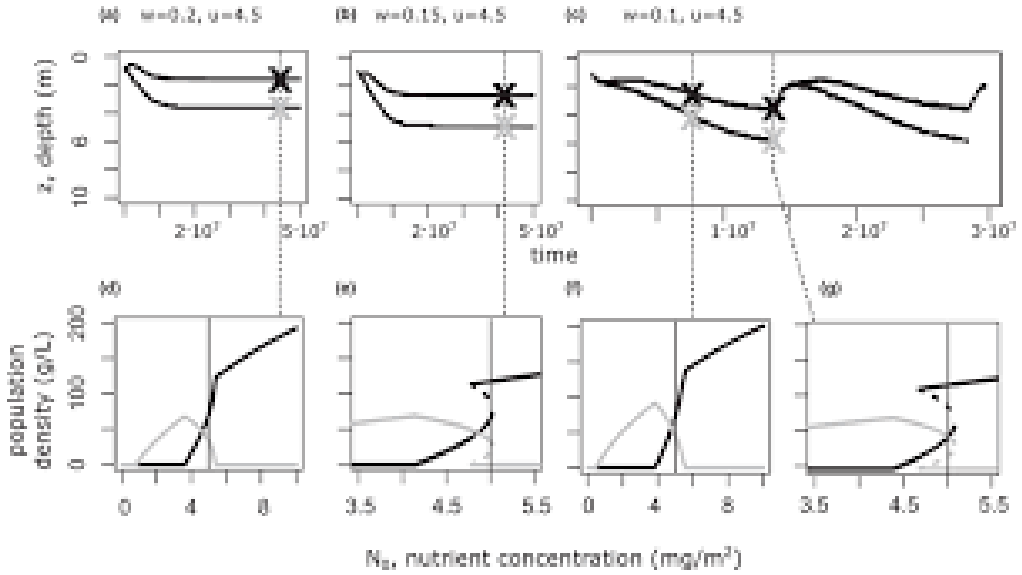


Figure 7: Ecological Dynamics

Sacred groves, nestled within the landscapes of Palakkad District, Kerala, exhibit a fascinating array of ecological dynamics that contribute to their unique character. This exploration delves into three critical aspects: microclimates, soil composition, and habitat functions, shedding light on the intricate relationships within these sacred ecosystems. (Cihon and Mattaini, 2019).

Microclimates within Sacred Groves:

A significant biological feature of sacred groves is the existence of microclimates, or isolated climates distinct from the surrounding ones (Ahmed *et al*., 2021). These microenvironments are the outcome of the distinct terrain, vegetation, and canopy patterns found in the groves. Many plant species with different temperature and humidity requirements may flourish because of the way sunshine, shade, and moisture interact to generate different niches. It is essential to comprehend these microclimates since they have a direct impact on the amount and distribution of flora in the sacred groves.

Soil Composition and Nutrient Cycling: It becomes clear that a sacred grove's ecological health is significantly influenced by the makeup of its soil. The nutrient content and soil profile studies shed light on the mechanisms

sustaining the wide variety of plant life in these environments (Muller, 2021). Sacred grove soils frequently have distinct qualities that are impacted by elements like plant detritus and organic matter from fallen leaves. This organic input improves the soil's fertility and speeds up the cycle of nutrients, fostering the development of a variety of plant species in a sustainable setting. Sacred groves' complex nutrient cycling dance adds to the general resilience and vitality of these ecosystems.

Habitat Functions and Niche Specialization: Sacred groves are complex environments that support a range of plant species with different ecological needs. These groves' carefully calibrated habitat functions provide niches that support the growth of various plant groups. Certain species could be adapted to certain kinds of soil or lighting, resulting in a mosaic of niches that enhance the biodiversity of the groves as a whole (Skott, 2019). Investigating the "Urul" (bamboo thickets) and "Karuka" (a kind of palm) clusters, the study reveals the complex ecosystem processes that sustain a wide variety of flora. Since it shows how different plant species cohabit and exchange resources within the boundaries of these sacred environments, an understanding of niche specialisation is crucial to deciphering the complex web of ecological relationships.

3.6 Phytosociological Investigations

Phytosociological studies in Kerala's Palakkad District reveal the complex patterns of plant communities by examining their spatial organization, ecological functions, and structural makeup (Witteveen, 2020). This area of research fosters a greater knowledge of the linkages and interdependencies that define the verdant landscapes by offering crucial insights into the dynamics of these distinctive ecosystems.

Structural Composition of Plant Communities: The structural makeup of plant communities found in sacred groves is the central focus of phytosociological studies. This entails a careful examination of the number and distribution patterns of the many species that dwell within the ecosystem (Witteveen and

Müller-Wille, 2020). The diversity and complexity of plant life are revealed by comprehending the structural constitution, which also throws insight on the ecological nuances that support the groves' survival. The ecological vigor and overall health of the groves are reflected in the makeup of these communities.

Spatial Arrangements and Interactions: In order to understand the patterns and interactions that control plant communities' coexistence, phytosociology examines the spatial arrangements of those communities. The spatial dynamics are influenced by the locations of various species within the groves, their proximity or dispersion, and the patterns of cooperation or competition. These configurations highlight the delicate balance that underpins the overall structure of the sacred groves and offer insightful information about the ecological relationships between different plant species (Soreng *et al.,* 2022). The research advances a comprehensive understanding of the phytosociological elements present in these ecosystems by interpreting these spatial nuances.

Ecological Roles and Interdependencies: Phytosociological studies center on the ecological roles that different plant communities play in sacred groves. Every species fulfills a specific ecological function and makes a unique contribution to the ecosystem. Some might function as primary producers, some as decomposers, and still others as providers of habitat. Comprehending these functions clarifies the interconnectedness among diverse plant species, creating an intricate network of ecological connections (Johnston *et al.,* 2019). In this context, phytosociology aims to elucidate the ways in which these interdependencies support the overall sustainability and stability of the sacred groves. The Palakkad District's phytosociological studies provide a thorough examination of the structural makeup, spatial configurations, and ecological functions of plant communities inside sacred groves. This study adds to understanding of these ecosystems from a scientific perspective and lays the groundwork for wise conservation tactics. To preserve the delicate balance of sacred groves and ensure their continuous existence as dynamic, interconnected landscapes, it is imperative to acknowledge the interplay between plant communities and their ecological functions.

3.7 Historical and Cultural Context

Sacred groves in Kerala's Palakkad District act as silent watchdogs over time, interlacing a rich cultural heritage with a deep historical evolution that the local people find meaningful. Through the prisms of historical development, cultural adaptations, and the long-lasting influence they have on people's lives, the story of these groves is revealed.

Historical Evolution of Sacred Groves: The history of sacred groves may be traced back to antiquity, when these enclaves were not only ecologically significant but also venerated for their spiritual and cultural value (De León and Hernández-Mena, 2019). These groves have stood the test of time, seeing the rise and fall of civilizations. Originally built as natural shrines, the groves have developed to represent the religious and cultural ethos of the groups that live in the area. They have preserved their sanctity over the years, serving as stores of historical continuity where time appears to stand still.

Cultural Evolution and Adaptations: The adaptive processes of local communities are reflected in the cultural evolution of sacred groves. The cultural customs and beliefs of succeeding generations have molded these landscapes. The groves have adapted to the local culture with ease, incorporating rites, rituals, and folklore that are now an essential part of the area's character. The cultural manifestations in these sacred places changed along with the standards of society. From being only physical places, the groves have developed into cultural microcosms that represent the collective memory and cultural legacy of the communities they support.

Impact on Local Communities: Sacred groves have a profound effect on nearby populations that goes beyond their ecological relevance and is intricately knit into the sociocultural fabric of the area. These groves actively participate in people's lives rather than being passive landscape elements (Regos *et al.,* 2022). The groves' customs mold the cultural calendar, designating important occasions and changes. The woodlands develop into gathering places for introspection, festivity, and spiritual exchange. Moreover, they provide social

cohesiveness and a common bond with the land, which helps to build a feeling of communal identity. Sacred groves, as the guardians of cultural diversity and historical continuity, are essential to maintaining the collective memory of the surrounding communities. They have evolved historically and culturally to reflect the flexibility and resiliency of the people they serve (Sillero and Barbosa, 2021). Understanding the complex interactions between history, culture, and the sacred groves is crucial for constructing a sustainable future that honors the deeply ingrained cultural legacy enshrined in these ageless settings as well as for comprehending the past.

3.8 Traditional Ecological Knowledge

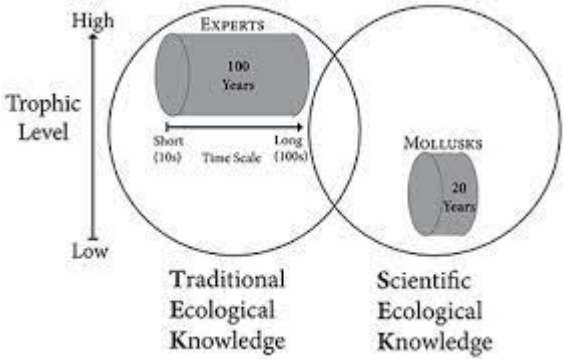


Figure 8: Traditional Ecological Knowledge

Traditional ecological knowledge (TEK), which embodies indigenous customs, deep understanding, and the continuing link between local populations and these respected landscapes, acts as a guiding light in the complex web of sacred groves (de Andrade *et al.,* 2020). In the setting of sacred groves, traditional knowledge and rituals, the complex connection between nearby communities and these sacred areas, and the essential generational transfer of information are all intertwined with TEK.

Indigenous Practices and Wisdom: The ancient customs and knowledge of the indigenous people of Kerala's Palakkad District are deeply ingrained in the sacred groves, having been handed down through the ages. The ecosystems of the groves, including plant species, wildlife interactions, and the finer points of microclimates, are well understood by the local populations. Sustainable

relationships with these ecosystems are guided by indigenous traditions, which are frequently based in spiritual and cultural beliefs (Zurell and Engler, 2019). This promotes a symbiotic relationship between the people and their sacred settings through ceremonies, harvesting practices, and seasonal observances that align with the groves' natural cycles.

Relationship between Local Communities and Sacred Groves: There is more to the relationship between nearby towns and sacred groves than just practical or recreational use. It is a complex relationship with overlapping ecological, spiritual, and cultural aspects. The groves are live examples of cultural legacy rather than just architectural structures. These places are deeply ingrained in the identity, history, and belief systems of the local populations, who view them as sacred areas (Ballullaya *et al.,* 2019). Because of this link, communities see themselves as stewards rather than just as residents, which promotes a sense of custodianship. The groves' continued survival is ensured by this complex relationship, which promotes sustainable behaviours.

Transmission of Knowledge across Generations: The generational transfer of TEK is one of its distinguishing characteristics in sacred trees. Elders in the community, who are frequently acknowledged as custodians of customary knowledge, are essential in transferring information to the next generation. Oral traditions, storytelling, and first-hand encounters in the groves are the ways in which this transmission takes place (Sreelekha *et al.,* 2021). Knowledge transmission is a dynamic process that changes with the times while retaining the core of traditional wisdom. Through ensuring that current conservation efforts are informed by time-tested knowledge, this intergenerational transfer not only maintains the continuity of traditional practices but also enhances the resilience of local ecosystems. For sacred groves to be managed sustainably, indigenous ecological knowledge must be respected and preserved. It is critical to acknowledge the inherent worth of indigenous customs and the long-lasting connection between the surrounding populations and these environments. Integrating traditional ecological knowledge into conservation methods is becoming not just a practical solution for the overall well-being of sacred

groves, but also a tribute to cultural legacy as these sacred spaces continue to face modern challenges.

3.9 Threats and Challenges

Sacred groves are subject to several risks and difficulties arising from anthropogenic pressures, environmental hazards, and shifting land use patterns that alter the delicate balance between cultural heritage and ecological preservation.

Anthropogenic Pressures: Sacred groves are seriously threatened by human activity. Practices like unapproved logging, agricultural development, and land encroachment are examples of how these pressures show up (Mariappan *et al.*, 2022). Anthropogenic pressures resulting from population increase and development demands are endangering the integrity of these sacred landscapes in Kerala's Palakkad District. Not only does the physical structure of these ecosystems change when infrastructure is built on sacred groves, but it also upsets the complex ecological balance that has developed over millennia.

Environmental Threats: The world's natural habitats are not exempt from the more general environmental problems. Threats to sacred groves include invasive species, habitat deterioration, and climate change (Debbarma *et al.*, 2020). The groves of Palakkad, which are located in the Western Ghats biodiversity hotspot, are susceptible to the effects of climate change, such as changes in temperature and precipitation patterns. These modifications may have an impact on plant species composition and upset the delicate balance between fauna and flora in these revered environments.

Changing Landscapes and Land Use: An additional layer of concern is posed by the ways in which land use trends are transforming the landscapes surrounding sacred groves. The surroundings of these trees are changed by infrastructure development, urbanization, and intensification of agriculture (Ellis *et al.*, 2021). Sacred groves are disappearing due to changes in property ownership, agricultural growth, and urban area encroachment. Sacred groves become more

isolated as the landscapes change, which affects their biological connectedness and may cause these special ecosystems to become fragmented.

A diversified strategy that recognizes the interdependence of environmental and cultural factors is needed to counter these challenges. It is crucial to strike a balance between development and conservation, putting an emphasis on sustainable methods that honor the ecological and cultural value of the sacred groves. increasing local populations' understanding of the cultural and ecological value of sacred groves. Involving local people in conservation initiatives fosters a feeling of collective accountability and ownership. promoting laws that establish strict penalties for unlawful activity and acknowledge the special character of sacred groves. To lessen anthropogenic pressures, this entails coordinating land-use policies with conservation objectives. putting ecological restoration strategies into action to mitigate environmental risks. To restore the ecological health of sacred groves, this may involve invasive species control, habitat restoration, and replanting projects. incorporating sacred groves into more comprehensive planning techniques for land use (Poorter *et al.,* 2023). This minimizes negative effects on these sacred landscapes' integrity by ensuring that developmental operations are carried out with careful awareness of them. Addressing human pressures, environmental challenges, and the effects of changing landscapes can help stakeholders secure the survival of sacred groves, conserving their unique cultural history and ecological importance for future generations.

3.10 Conservation Strategies

Comprehensive techniques are necessary to negotiate the intricate interactions between cultural, ecological, and legal factors in the field of sacred grove protection. Policy analysis, gap analysis, and a review of current legislative frameworks provide the groundwork for developing suggestions that support sustainable conservation activities.

Existing Legal Frameworks: Laws pertaining to cultural heritage and the environment frequently provide protection for sacred trees. These legislative

frameworks, which have laws addressing biodiversity conservation, forest protection, and cultural heritage preservation, differ both internationally and among individual nations (Thomas, 2023). For example, national environmental rules and regulations concerning forests and biodiversity in Palakkad, India, help to preserve sacred groves. However, how strictly these laws are enforced and how much they take into account the special qualities of sacred groves will determine how effective they are.

Policy Analysis: Carefully examining current regulations is essential to the maintenance of sacred groves. Examining forest management plans, safeguards for cultural assets, and any particular laws pertaining to sacred places are all examples of this. Finding the gaps in these regulations is essential to comprehending the areas where the present frameworks are inadequate for meeting the complex requirements of sacred groves. For example, regulations could not fully take into account the spiritual and cultural aspects of these landscapes, or they might not specifically provide for community engagement in conservation initiatives.

Recommendations for Sustainable Conservation: Enhancing and sustainably strengthening sacred grove conservation efforts may be achieved by crafting suggestions based on policy analysis and legal framework insights promoting the active participation of nearby communities in the procedures used to make decisions on sacred trees (Fulford *et al.,* 2020). This entails embracing community-led conservation projects, establishing a sense of ownership, and acknowledging and honoring indigenous knowledge and traditions. encouraging the integration of scientific, cultural, and ecological viewpoints through an interdisciplinary approach. To guarantee comprehensive conservation measures, this calls for cooperation between environmental scientists, cultural specialists, and local populations. putting in place educational programs to increase public understanding of the cultural and ecological relevance of sacred groves. This entails public awareness campaigns, curriculum integration in schools, and community engagement initiatives to foster a feeling of pride and accountability for maintaining natural landscapes.

promoting the strengthening of laws that specifically safeguard sacred trees (Molnár and Babai, 2021). This can entail making changes to already-existing laws or drafting new legislation that acknowledges the special status of certain locations in light of their ecological and cultural significance. putting in place routine surveillance systems and funding further studies on sacred trees. This makes it easier to gather information on biodiversity dynamics, ecological shifts, and cultural practices information that serves as the foundation for adaptive conservation initiatives.

3.11 Comparative Analysis

A cross-regional comparative investigation reveals the sacred groves of Palakkad as unique ecosystems with characteristic traits that add to a complex ecological and cultural fabric. Beyond Palakkad's borders, the investigation offers cross-cultural insights on the many functions and traits of sacred groves across the globe.

Sacred Groves in Other Regions: Studying sacred groves throughout many regions of the world exposes a range of customs and beliefs related to these distinct environments. Sacred groves may be found around the world in local stories, from the deep jungles of South America to the historic woods of Europe (Albuquerque *et al.,* 2021). Comparative examination clarifies the diverse mythologies, religious customs, and conservation tactics used in different geographical areas. A more comprehensive understanding of sacred groves' worldwide distribution and cultural importance creates a framework for recognizing their contributions to biodiversity and cultural heritage preservation.

Unique Features of Palakkad's Groves: Sacred groves in Palakkad are distinctive because of their intricate ties to the local ecosystem and culture, making them stand out in this global mosaic. Due to the trees' frequent association with Hindu temples, religious observance and environmental preservation are seamlessly merged in Palakkad. In contrast to certain other areas where sacred groves are only the remains of old woods, Palakkad's groves

are actively maintained, and the local population is crucial to their preservation (Das *et al.,* 2021). These groves are unique because of the microclimates, soil types, and ecological roles that are unique to Palakkad. These characteristics are highlighted by comparative analysis, which presents Palakkad's groves as living environments where natural and cultural elements coexist.

Cross-Cultural Insights: Investigating sacred groves in many locales offers priceless cross-cultural understanding. Diverse cultural settings provide a sophisticated knowledge of how societies interact with their environment. Some cultures place a strong emphasis on the spiritual qualities of groves, while others can highlight their ecological value. Finding similar themes, like the function of groves in biodiversity protection and their relationship to cultural identity, is made possible by cross-cultural perspectives (Hosen *et al.,* 2020). The discussion on the significance of sacred groves worldwide is enhanced by this comparative perspective, which highlights common problems and cooperative conservation tactics. An intriguing interaction between ecological subtleties and cultural variation is shown through a comparative investigation of sacred trees in Palakkad and other areas (Casi *et al.,* 2021). Sacred groves of Palakkad make a substantial contribution to this global story by illustrating the complex interrelationships among culture, environment, and the shared human experience.

3.12 Role in Biodiversity Conservation

In Kerala's Palakkad District, sacred groves are vital to the preservation of genetic variety and serve as havens for native plant species, making them essential to the fight against biodiversity loss. Beyond their religious and cultural value, these sacred landscapes serve as essential botanical variety reservoirs, supporting a complex tapestry of flora that reaches beyond traditional habitats. One of the most important aspects of sacred groves' contribution to biodiversity preservation is their preservation of native plant species (Stori *et al.,* 2019). A wide assortment of plants might be found in these groves, some of which are exceptional to the area. These local plants have prospered in the sacred groves because of hundreds of years of security and social wonderment, making an unmistakable floral sanctuary that stands out pointedly from the rapidly moving environmental elements outside. The groves safeguard the region's natural inheritance by working as living exhibition halls of local vegetation. Safeguarding hereditary variety is one of sacred groves' primary commitments to the security of biodiversity. Various plant species might be tracked down in the groves, and every one has created remarkable hereditary qualities over numerous ages. The flexibility and durability of plant populations, particularly in the face of shifting ecological dynamics and environmental changes, depend heavily on this genetic diversity. Sacred groves retain a store of varied genetic material that supports the general well-being and sustainability of the environment (Haq *et al.,* 2023). Additionally, sacred groves are essential to the preservation of unique and endangered plant species. These groves serve as havens for plant species that may be having difficulty surviving in the face of threats from urbanization and habitat degradation, which are threatening a variety of ecosystems. These uncommon and endangered plants can find refuge in the remote and guarded surroundings of the sacred groves, which also provide the right circumstances for their survival and possible future propagation. Moreover, the role that the sacred groves play in protecting native plant species goes beyond the limits of the Palakkad District. These groves' distinctive plant life may contain priceless genetic material with wider

applications for sustainable agriculture and ecological restoration. These groves act as living labs, providing insights into how the preservation of native species might spur larger environmental preservation initiatives, as worries about biodiversity loss gain momentum worldwide (Dkhar and Tiwari, 2020). Essentially, the sacred groves of the Palakkad District become essential protectors of biodiversity, actively contributing to the preservation of genetic variety, the conservation of rare and endangered plant species, and the conservation of native plant species. Their contribution to the global conversation on sustainable biodiversity protection transcends regional boundaries.

3.13 Traditional Practices and Customs

Sacred trees have a significant impact on regional practices, which are woven into the rich tapestry of the cultural legacy of the Palakkad District. Traditional methods for protecting sacred groves and cultural rituals that are essential in influencing ecological behavior are examples of this effect.

Influence of Sacred Groves on Local Customs: The local community's rituals and traditions heavily revolve around sacred groves. People's interactions with and perceptions of their natural environment have been shaped throughout millennia by the profound spiritual and cultural importance associated with these groves. The groves are revered in the local ways, which include them in festivals, rituals, and everyday life (Proulx *et al.,* 2021). The groves develop into living emblems of cultural identity that influence the people's customs in addition to being actual physical locations.

Traditional Practices for Sacred Grove Conservation: The community's customs for protecting sacred groves are deeply ingrained in its cultural fabric. These customs provide witness to the realization that the health of the groves and the people's cultural identity are intrinsically linked. There are established community-led management systems in which the local populace assumes stewardship responsibilities. Important ecological occurrences are marked with rituals and ceremonies that promote a sense of group responsibility for

maintaining the grove. The customs guarantee that conservation becomes an essential aspect of the community's daily existence.

Cultural Rituals Shaping Ecological Behavior: The customs connected to sacred groves influence ecological behavior in a significant way. These customs serve as useful tools for ecological stewardship in addition to being cultural manifestations. When ceremonial tree plantings coincide with auspicious events, they become actions that are important for both the environment and culture. The purpose of regular rituals like controlled burning and cleanups is to keep the groves' ecological equilibrium intact (Reis-Santos *et al.,* 2023). The integration of ecological behavior and cultural rituals highlights a holistic perspective in which cultural practices and environmental health are inextricably intertwined. Essentially, the way that sacred groves impact regional traditions is a result of the dynamic interaction between ecological awareness and cultural respect. The customs and ceremonies that surround these trees demonstrate the peaceful coexistence of sustainable environmental protection with the preservation of cultural legacy.

3.14 Urbanization and Changing Landscapes

The sacred groves tucked away in Kerala's Palakkad District are severely impacted by the encroaching urbanization and changing land use practices. These sacred landscapes suffer a number of threats that threaten their very existence, such as the spread of concrete jungles and the increasing frequency of land alterations. Sacred groves are affected by urbanization in a variety of ways and with different consequences. As urban areas grow and impact the natural landscape, one of the main issues is land use changes. These groves' borders are frequently violated by the encroaching expansion of urban infrastructure, which reduces the area of the groves and fragments their ecosystems (Meyer *et al.,* 2020). The physical continuity of the groves is broken by this invasion, and it also interferes with the complex biological relationships that support the species there. Challenges relating to modified hydrological patterns are another effect of changing landscapes. Water flow and absorption are altered by the

construction of impermeable surfaces like buildings and roads, which is a common aspect of urbanization. This in turn has an effect on the water sources inside and outside of the sacred groves, which may upset the delicate moisture balance and have an effect on the animals and plants that depend on these ecosystems.

When land reforms and changing ownership patterns are combined, the consequences of land use changes on sacred groves are more noticeable. The integrity of these groves is threatened by land sales and ownership changes as traditional community lands buckle under the weight of urban growth. Along with problems pertaining to joint family structures, the practice of selling property to people who have no affiliation with religion plays a part in the loss and relocation of these ecologically and culturally vital landscapes. Grazing by cattle, which is frequently linked to altered land use in urbanizing regions, poses a direct danger to the rare species found in sacred groves. Overexploitation of resources resulting from uncontrolled grazing can negatively affect the fragile ecological balance and jeopardize the survival of rare and indigenous plant species. The problems that sacred groves confront are exacerbated by changes in land ownership and the growing demand for resources that come with urbanization (DeWitt *et al.,* 2020). The effects of urbanization and shifting topography on the sacred groves in the Palakkad District are profound and complex. These groves are negotiating a complicated web of problems that include changes in land use patterns, ownership transitions, and the accompanying concerns of overexploitation. Examining these issues is more than just a scholarly endeavor; it is a call to action to provide viable solutions that can guarantee sacred groves survive with urbanization while safeguarding their ecological and cultural heritage for future generations.

3.15 Local and Global Relevance

The sacred groves in Kerala's Palakkad District extend well beyond their local borders, with significant consequences for safeguarding biodiversity worldwide

and preserving cultural legacy. Deeply ingrained in Kerala's identity, these distinctive ecosystems function as priceless microcosms with significance that extend well beyond their local geographic setting. The implications of these sacred groves for biodiversity conservation shed light on their relevance on a global scale (Dickey-Collas *et al.,* 2022). These groves, which are hotspots for biodiversity, are home to a wide variety of native plant and animal species, supporting efforts worldwide to preserve and protect genetic diversity. In addition to being a valuable local resource, the research's thorough taxonomical recording advances understanding of plant species and provides information that can influence biodiversity management strategies around the globe. In a time when there are more and more challenges to the world's biodiversity, these groves become vital archives that help to maintain the delicate balance of ecosystems. The research explores how sacred groves contribute to the preservation of cultural heritage across the world. These trees are more than just physical landscapes; they are a living heritage that symbolizes the historical connection between the Keralan people and their cultural customs.

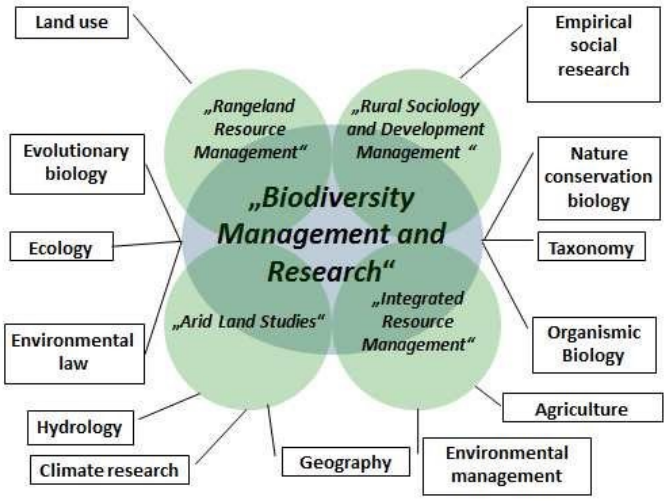


Figure 9: Biodiversity Management

The study illuminates the practices and traditions ingrained in the groves and offers a complex viewpoint on the relationship between ecological resilience and cultural legacy. This story crosses geographical borders to become a universal story in dialogues concerning the cohabitation of culture and

environment. These sacred groves have worldwide significance that extends to the larger conversation about sustainable development. Through highlighting the interdependence of ecological and cultural elements, the research contributes to the worldwide discourse on the difficulties of maintaining distinct identities while promoting sustainable practices. The knowledge gleaned from taxonomy, ecology, and phytosociology studies provides a model for communities across the world with comparable difficulties in preserving their natural and cultural legacy. The Palakkad District's sacred groves are significant on a worldwide scale (Prasad *et al.,* 2021). They are not only regional assets but also priceless contributors to the worldwide endeavor to address the complex interactions between culture and environment because of their involvement in biodiversity protection, contributions to the conservation of cultural heritage, and insights into sustainable development. As the study progresses, it turns into a lighthouse that directs international conversations about biodiversity conservation and the fine balance between cultural traditions and ecological resilience.

3.16 Models and Theories

Taxonomical Frameworks in Biodiversity Research

Biodiversity research within sacred groves relies on robust taxonomical frameworks to systematically categorize and understand the rich plant diversity present. The Linnaean Taxonomy, established by Carl Linnaeus, shapes the foundation of this examination, offering a classical and efficient way to deal with recording the ordered variety inside sacred groves. Through Linnaean taxonomy, plant species are grouped in light of shared qualities, giving a foundational design to distinguishing proof and documentation. This historical and organized system helps specialists in making an extensive catalog of plant species, adding to the comprehension of the ordered piece of consecrated groves (Ballullaya *et al.,* 2019). Linnaean taxonomy includes hierarchical characterization, going from general classifications like realm and phylum to explicit arrangements like variety and species. This methodical methodology

works with the association and distinguishing proof of vegetation inside consecrated groves, offering a normalized language for correspondence among specialists and progressives. By applying Linnaean taxonomy, specialists can recognize the connections between various plant species, laying the basis for additional ecological and protection studies.

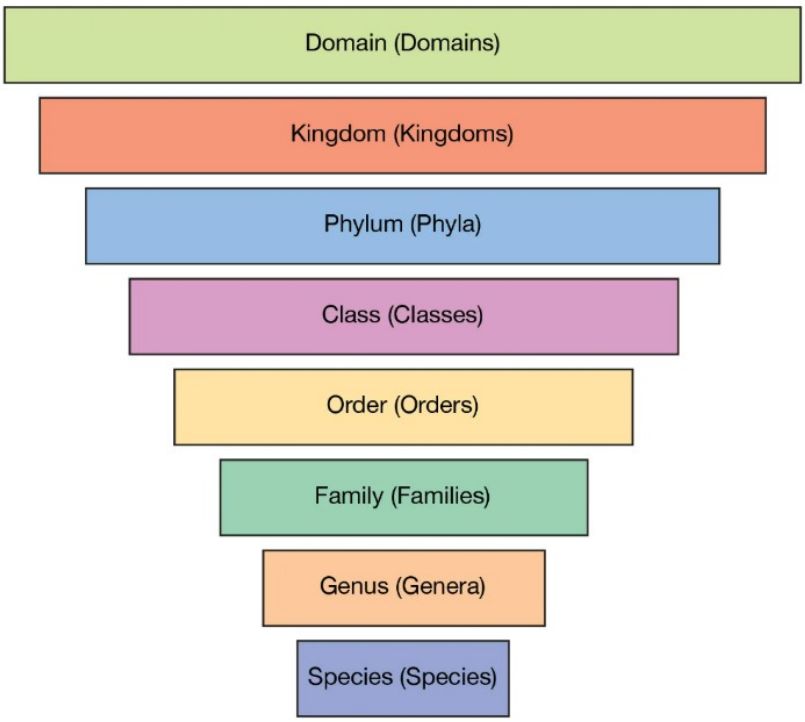


Figure 10: Linnaean taxonomy

Supplementing the classical approach, Phylogenetic Classification arises as a cutting edge model for figuring out the developmental connections among plant species in sacred groves. Phylogenetics includes the investigation of developmental history and genetic connections, giving a more nuanced comprehension of the interconnectedness of various species (Prasad and Archana, 2023). With regards to sacred groves, applying phylogenetic analyses empowers scientists to disentangle the transformative elements, revealing examples of speciation, variation, and broadening. Phylogenetic classification models use sub-atomic information, for example, DNA sequences, to recreate the transformative connections among plants. This approach goes past the morphological qualities thought about in Linnaean taxonomy, offering experiences into the genetic dissimilarity and transformative history of sacred

forest verdure. By consolidating phylogenetics, specialists gain a more profound comprehension of how plant species in these biological systems have developed over the long haul, adding to an all encompassing perspective on biodiversity. The mix of Linnaean Taxonomy and Phylogenetic Classification gives a thorough and multifaceted approach to taxonomical structures in biodiversity research inside sacred groves. These models, established in historical establishments and present day genetic bits of knowledge, all in all add to disentangling the perplexing woven artwork of plant variety in these culturally and ecologically huge scenes.

Ecological Models for Microclimate Analysis

The investigation of microclimates inside sacred groves is essential for grasping the mind boggling ecological elements of these novel biological systems (Sillero *et al.,* 2023). Ecological Niche Models (ENMs) and Biogeographic Models, stand out as valuable apparatuses in analyzing microclimates and spatial dispersion of plant species inside sacred groves. ENMs are instrumental in disentangling the intricacies of microclimates inside sacred groves. These models anticipate and analyze the ecological niches of plant species, giving experiences into the environmental circumstances that impact their dispersion (Krishna *et al.,* 2023). By taking into account factors like temperature, precipitation, and soil arrangement, ENMs assist analysts with understanding the particular microclimatic prerequisites of various plant species. With regards to sacred groves, ENMs add to anticipating the reasonable living spaces for different plants, supporting the recognizable proof of key microclimatic zones inside these environments. This prescient capacity is crucial for preservation endeavors, empowering scientists to evaluate the weakness of explicit species to changing environmental circumstances and guide versatile administration systems.

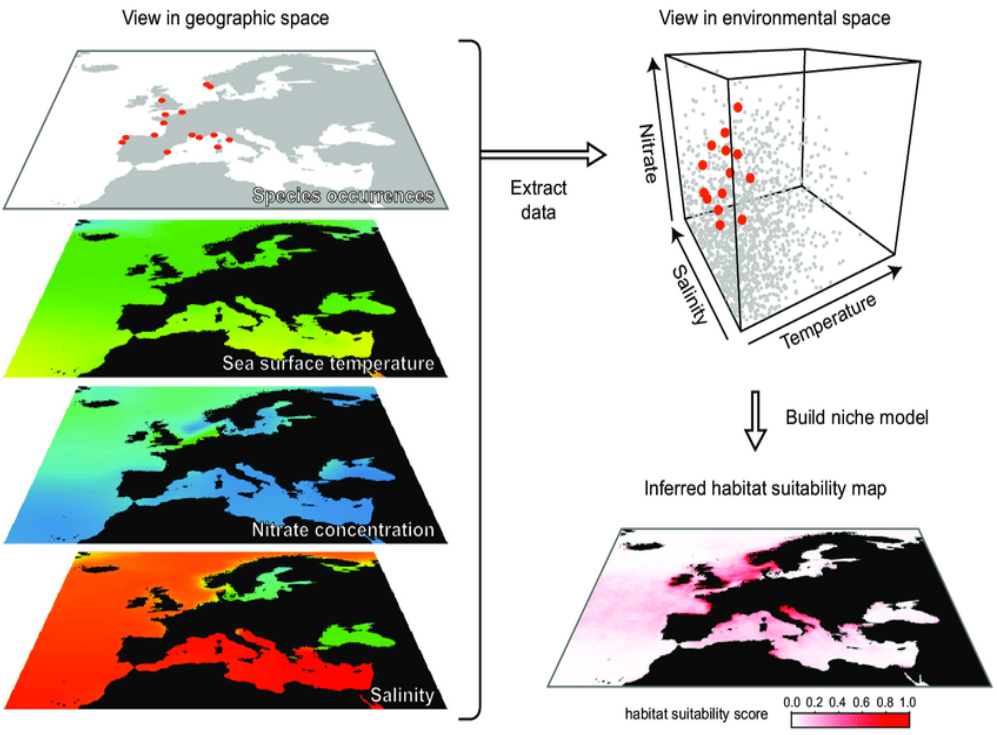


Figure 11: Ecological Niche Models (ENMs)

Biogeographic models stretch out the analysis to the spatial circulation of plant species inside sacred groves. These models investigate the geographic examples of biodiversity, considering factors like topography, land cover, and connectivity between various regions inside the groves. By utilizing biogeographic standards, analysts can recognize focal points of biodiversity and understand how the spatial course of action of plant networks adds to the overall ecological construction (Krolczyk *et al.,* 2019). Biogeographic models assume a pivotal part in clarifying what environmental heterogeneity means for the creation and variety of sacred groves. Understanding the spatial elements adds to powerful protection arranging, featuring regions with high preservation value and potential halls for biodiversity development.

Ecological Niche Models and Biogeographic Models act as crucial instruments for analyzing microclimates and spatial dissemination inside sacred groves. These models improve the ecological understanding of these environments, giving valuable experiences to protection drives and reasonable administration rehearses. The combination of these ecological models adds to a comprehensive

approach in translating the complex connections between plant species and their current circumstance inside the culturally huge landscapes of sacred groves.

Theories of Plant Community Dynamics in Phytosociological Studies

Phytosociological studies inside sacred groves involve unraveling the intricate elements of plant communities, and two prominent theories, Clementsian Succession Theory and Guild Theory, offer valuable experiences into the spatial arrangements, successional patterns, and ecological roles of plant species inside these culturally huge landscapes. Clementsian Succession Theory proposed by Frederic E. Clements, focuses on the predictable and directional nature of plant local area development over time (Kéfi *et al.*, 2019). In the context of sacred groves, applying the Clementsian Succession Theory involves understanding how plant communities change and evolve inside these ecosystems. Researchers assess the successional patterns, from the establishment of pioneer species to the development of peak communities, to decipher the temporal elements of plant communities. By breaking down these successional stages, specialists gain a nuanced understanding of how sacred forests change over the long haul and the ecological elements impacting these changes. This hypothesis gives a system to investigate the steadiness and resilience of plant networks inside sacred forests, adding to the more extensive phytosociological understanding of these unique ecosystems.

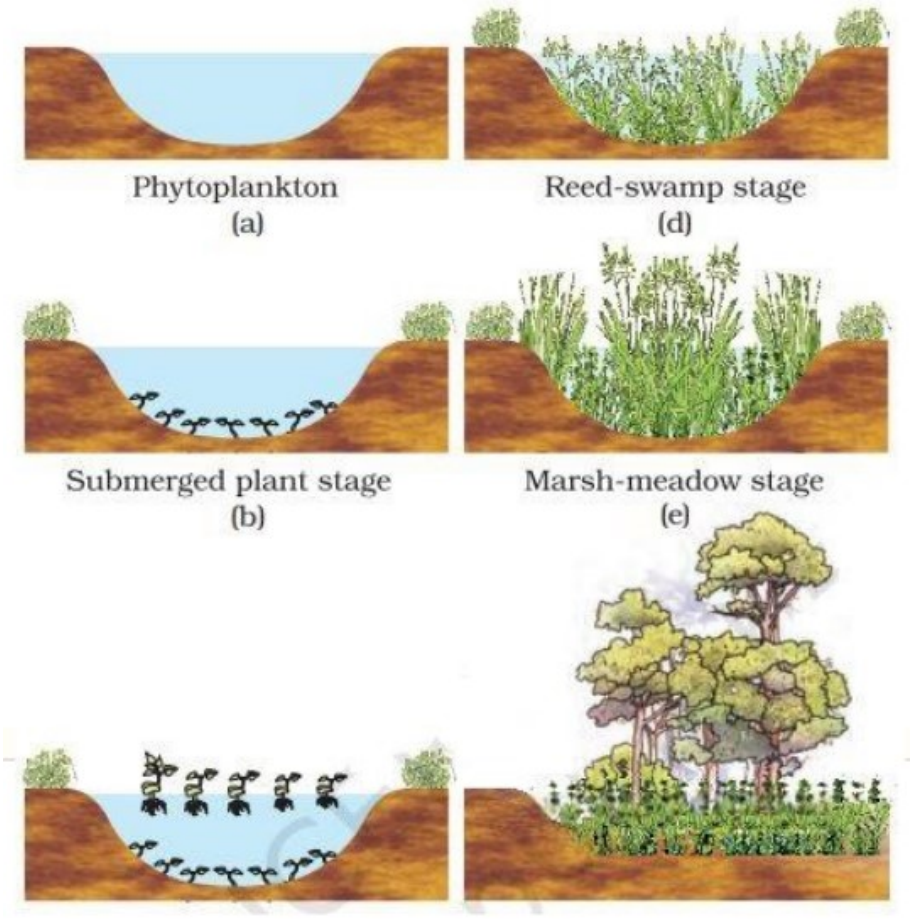


Figure 12: Clementsian Succession Theory

Guild theory centers around the utilitarian jobs and communications among various plant species in light of their ecological capabilities. With regards to sacred groves, applying Guild Theory permits analysts to arrange plants in light of shared ecological capabilities and niche specialization. Investigating how plant species inside a guild interact and contribute to the overall ecological balance provides critical bits of knowledge into the functional diversity of sacred groves. Guild theory enhances phytosociological studies by elucidating the complex web of interactions and dependencies among plant species (Danovaro *et al.,* 2020). Understanding these ecological roles is essential for effective conservation and management practices, ensuring the preservation of the unique biodiversity and cultural significance of sacred groves. Clementsian Succession Theory and Guild Theory serve as valuable frameworks for phytosociological studies inside sacred groves. The utilization of these theories enriches understanding of the spatial arrangements, successional patterns, and

ecological roles of plant communities, adding to the broader knowledge of these culturally and ecologically huge landscapes.

Integrative Models for Comprehensive Analysis

Sacred groves, as unique ecosystems, require an integrative approach that combines taxonomical, ecological, and phytosociological perspectives. Integrative models, for example, Ecosystem-based Management Models and Resilience Theory, offer a comprehensive understanding of these landscapes, working with effective conservation and sustainable management practices. Ecosystem-based Management (EBM) models represent an all encompassing approach that considers the intricate relationships between taxonomy, ecology, and phytosociology inside sacred groves (Panwar *et al.*, 2023). By integrating taxonomical information on plant diversity, ecological bits of knowledge into microclimates and living space capabilities, and phytosociological understandings of local area elements, EBM models provide a powerful framework for decision-production in conservation and management. These models empower the recognizable proof of key preservation targets, assisting with focusing on endeavors in view of the ecological meaning of explicit plant species and their jobs inside the environment. Furthermore, EBM models assist with creating reasonable administration rehearses that balance the social and ecological upsides of sacred groves.

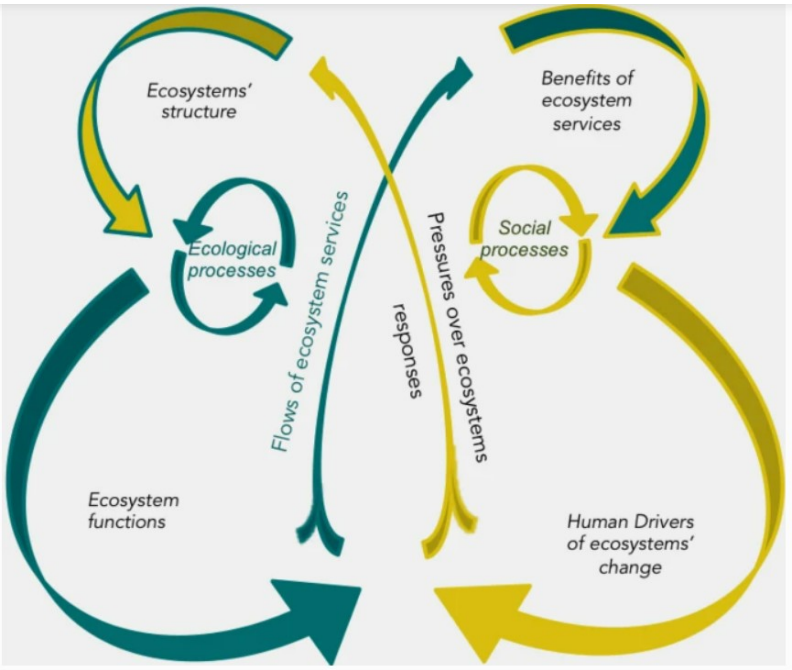


Figure 13: Ecosystem-based Management (EBM)

Resilience Theory contributes a unique viewpoint to the thorough investigation of sacred groves. This theory investigates the limit of ecosystems to acclimatize aggravations, conform to changes, and recuperate over the long haul. Applying resilience theory to sacred groves includes surveying their capacity to withstand outside pressures, for instance, environmental change or human exercises. By understanding the elements that enhance resilience, conservationists and managers can develop strategies to ensure the drawn out health and biodiversity of these ecosystems (Bodin *et al.*, 2019). Resilience-focused approaches also consider the cultural and religious aspects, acknowledging that the resilience of sacred groves extends beyond ecological elements to encompass the preservation of traditional practices and beliefs associated with these landscapes.

An effective approach involves integrating EBM models with resilience theory, creating a vigorous analytical framework for sacred grove management. This integrated model considers taxonomical, ecological, and phytosociological dimensions, giving a comprehensive understanding of the complex interactions inside these ecosystems. By joining these models, conservation efforts can address both immediate threats and long haul maintainability, recognizing the

interconnectedness of biological diversity, ecosystem services, and cultural significance. Integrative models offer a powerful device for the comprehensive analysis of sacred groves. Ecosystem-based Management Models and Resilience Theory, when combined, provide a nuanced understanding that goes beyond individual components. This holistic approach supports conservation and management strategies that not only preserve the unique biodiversity of sacred groves but also respect and sustain the cultural and religious values embedded in these extraordinary landscapes.

3.17 Literature gap

This literature analysis identifies significant gaps in the vast terrain of scholarly investigations into sacred groves, beckoning additional research and discovery. The sections that follow define these gaps, providing a complete review of the shortcomings revealed in previous studies.

3.17.1 Insufficient Taxonomic Exploration

A noteworthy absence exists in the realm of taxonomic inquiry inside sacred groves, generating a noticeable gap in understanding of these distinct ecosystems. The current literature demonstrates a distinct lack of proper documentation of the varied plant species that occupy these sacred settings. Taxonomic research inside sacred groves is hampered by substantial gaps, leaving critical elements of plant biodiversity undiscovered and unknown. A lack of taxonomic study impedes a thorough knowledge of the rich taxonomic composition of sacred groves. The lack of plant species recording prevents researchers and conservationists from gaining a comprehensive understanding of the diverse flora that contributes to the biological diversity of these areas. This gap impedes conservation efforts by leaving unrecognized and unassessed components of the plant community, making it difficult to develop effective biodiversity management methods (Reyers and Selig, 2020). The absence of extensive taxonomic investigations inside sacred groves leads to wasted possibilities to discover possibly new or uncommon plant species. These unknown species might be ecologically significant or have unique qualities that

could help in a variety of industries, such as medicine or agriculture. Inadequate taxonomic investigation inside sacred groves not only hinders understanding of their plant variety but also obstructs larger conservation efforts. Bridging this gap via detailed taxonomic investigations is critical for revealing the hidden botanical gems of these ecosystems, opening the path for informed conservation policies and the sustainable management of their biological diversity.

3.17.2 Limited Ecological Understanding

The literature assessment reveals a serious vacuum in the thorough research of the ecological processes within sacred groves. Microclimates, in particular, which play a critical role in influencing the overall health and vitality of these ecosystems, receive little attention in current studies (Al-Swidi *et al.,* 2021). The intricate nuances of microclimates inside sacred groves have not gotten the attention necessary for a complete understanding, leaving a significant gap in ecological knowledge. The investigations on soil composition inside sacred groves are noticeably limited, highlighting the gaps in understanding of these ecosystems. Soil, being a key component of every biological system, has a tremendous impact on the flora and animals that inhabit sacred groves. The scarcity of study in this field limits capacity to appreciate the complicated links between soil qualities and the varied plant life seen in these environments. Another major factor contributing to the inadequate ecological study is the lack of a detailed assessment of the habitat functions provided by sacred groves (Knill and Tosun, 2020). These ecosystems, which are frequently regarded as biodiversity hotspots, serve critical services in their surrounding habitats. The lack of a systematic investigation of these roles constitutes a significant gap in understanding of the larger ecological impacts of sacred groves. These constraints, taken together, impair the comprehensive understanding essential for developing sustainable environmental management practices and plans. A better knowledge of microclimates, soil composition, and habitat functions is required for developing successful conservation strategies. By addressing these gaps in ecological understanding, researchers and conservationists may devise

policies that not only maintain the unique biodiversity of sacred groves but also contribute to overall ecosystem health and resilience.

3.17.3 Phytosociological Gaps

A notable gap develops in the sphere of phytosociological investigation inside the sacred groves domain. This deficit is especially noticeable in plant local area spatial formats. The present literature reveals a particular absence of proper expertise in this respect, hindering the development of a nuanced understanding of the structural piece of sacred grove ecosystems (Hill and Varone, 2021). The unique spatial patterns of plant bunches inside sacred groves shape overall ecosystem elements. However, an absence of comprehensive research makes it hard to acquire a clear knowledge of how different plant species interact spatially, which is essential for analyzing the ecological connections inside these landscapes. This data gap is a key impediment to developing successful conservation strategies that address the unique structural characteristics of sacred groves. The roles of plant bunches inside sacred groves remain obscure. Each plant species contributes individually to the overall ecological balance, influencing processes, for example, nutrient cycle, soil structure, and territory supply. The absence of an in-depth investigation of these ecological responsibilities obscures crucial features of the complicated web of interconnections among sacred grove ecosystems (Bhatt *et al.,* 2023). These observed limitations in phytosociological understanding together hamper the establishment of informed conservation policies and strategies for maintaining the delicate balance inherent in sacred groves. To ensure the preservation of these distinctive landscapes, it is critical to investigate the spatial dynamics and ecological roles of plant communities. By addressing these gaps, researchers and conservationists may create more focused and effective ways that contribute to the long-term management and protection of wildlife.

Underexplored Cultural Significance

The understudied cultural importance of sacred trees creates a substantial gap. The historical and cultural linkages woven into the fabric of these ecosystems

are only partially examined. There is a scarcity of extensive evidence on the interweaving of sacred groves with the cultural history of the places they inhabit (Button *et al.,* 2020). Similarly, traditional ecological knowledge, which is an important component of cultural importance, is underdocumented. Bridging these gaps is critical for gaining a comprehensive grasp of the socio-cultural fabric that sacred groves represent.

3.17.4 Inadequate Conservation Frameworks

The literature research highlights a crucial vacuum in the field of conservation frameworks for sacred groves. There is a scarcity of comprehensive conservation strategies that are adapted to the particular problems that these ecosystems confront. Inadequate attention is paid to mitigating both anthropogenic and environmental challenges, leaving these sacred landscapes exposed to a variety of dangers.

3.17.5 Limited Comparative Analysis

The comparison of sacred groves reveals a significant disparity. The lack of studies comparing these groves internationally or investigating regional differences restricts the larger cultural and ecological insights that may be garnered.

3.17.6 Ineffective Legal Frameworks

The insufficiency of legal structures protecting sacred trees is a notable gap. Existing legislative safeguards have substantial gaps, failing to offer adequate protection for these culturally and environmentally vital regions.

3.17.7 Incomplete Understanding of Global Relevance

The analysis of the literature reveals an insufficient grasp of the global significance of sacred groves. Local discoveries are poorly incorporated into global discourse, and the global effect of these orchards is underappreciated (Khairy *et al.,* 2019). Addressing these highlighted gaps is critical for furthering understanding of sacred groves, encouraging successful conservation measures, and recognizing their larger significance in both cultural and ecological contexts.

3.18 Conceptual framework

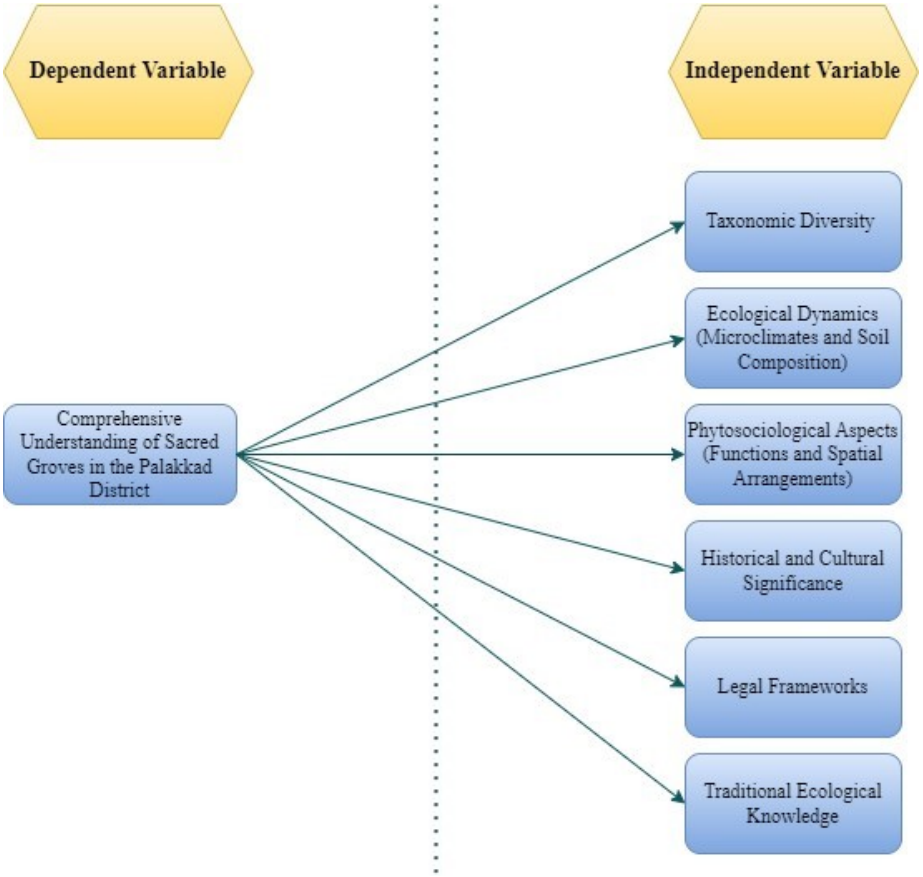


Figure 14: Conceptual Framework

Dependent variable

The dependent variable in this research is the "Comprehensive Understanding of Sacred Groves in the Palakkad District," encompassing a holistic perception of taxonomic diversity, ecological dynamics, phytosociological aspects, historical and cultural significance, traditional ecological knowledge, threats and challenges, a comparative analysis, and an assessment of legal frameworks. These facets collectively contribute to a nuanced and thorough comprehension of the subject matter.

Independent Variables

Taxonomic Diversity: This variable contributes significantly to biodiversity cataloging and conservation efforts (Suzuki *et al.,* 2020). The taxonomic diversity provides a foundational understanding of the plant life present in these ecosystems, serving as a crucial aspect in the broader comprehension of sacred groves.

Ecological Dynamics (Microclimates and Soil Composition): This independent variable explores the ecological dynamics of sacred groves, including microclimates and soil composition. These variables influence the overall health and working of the ecosystems (Ray and Ray, 2020). Understanding microclimates and soil composition sheds light on the intricate relationships between environmental variables and the prospering biodiversity inside sacred groves.

Phytosociological Aspects (Functions and Spatial Arrangements): The variable focuses on the phytosociological aspects of sacred groves, examining the functions and spatial arrangements of plant communities. This provides bits of knowledge into the structural composition of these ecosystems, revealing how different plant species coexist and contribute to the overall balance.

Historical and Cultural Significance: The independent variable explores the historical and cultural significance of sacred groves. This aspect delves into the impact of these landscapes on religious practices, rituals, and the cultural identity of local communities. Unraveling this variable enhances the understanding of sacred groves as living embodiments of cultural heritage.

Traditional Ecological Knowledge: This variable encompasses traditional ecological knowledge associated with sacred groves. This knowledge, passed down through generations, showcases the dynamic interactions between indigenous communities and these ecosystems. It is a key element influencing the sustainable coexistence of communities and groves.

Legal Frameworks: This independent variable evaluates the effectiveness of existing legal frameworks and policies in safeguarding sacred groves. This variable critically examines the regulatory mechanisms in place and their impact on conservation efforts and sustainable management practices.

The interdependence of independent variables in the research framework cultivates a synergistic approach, crucial for comprehending the comprehensive understanding of sacred groves in Palakkad. Taxonomic diversity forms the bedrock, meticulously cataloging plant species, laying the groundwork for ecological exploration. Ecological dynamics and phytosociological aspects intricately elucidate environmental nuances and plant community relationships, weaving a tapestry of interconnected insights. Historical and cultural significance enriches the narrative, providing context and depth, while traditional ecological knowledge threads indigenous wisdom throughout. Legal frameworks act as a critical lens, ensuring governance structures align with conservation goals (Swetha and Pramod, 2020). This cohesive interplay converges into the dependent variable, offering a holistic understanding that transcends ecological, cultural, and legal realms. This nuanced comprehension contributes indispensably to the preservation and appreciation of the sacred groves, emphasizing their ecological and cultural significance.

3.19 Summary

The broad review of scholarly literature on sacred groves reveals both the advances achieved in understanding these ecosystems and the significant gaps that require more research. The evaluation of the literature traveled across taxonomic, ecological, and phytosociological dimensions, unraveling layers of meaning contained in sacred groves while emphasizing their importance in cultural preservation, conservation, and sustainable coexistence. The observed gaps in the literature reflect not just the limitations of existing research, but also the potential to extend the discourse on sacred trees. Inadequate taxonomic study exposes a fundamental gap in comprehending the various plant species that occupy these habitats. Conservation and management of biodiversity within sacred groves are hampered in the absence of a broad taxonomic

foundation. Bridging this gap demands detailed documentation, which serves as the foundation for successful decision-making. The lack of ecological expertise, particularly gaps in microclimate research, soil composition investigations, and habitat function evaluations, highlights the need for a more comprehensive approach. Microclimates, which are inextricably linked to the general health of sacred groves, necessitate close examination. Understanding the nutrient dynamics that are critical to plant life requires a detailed examination of soil composition. Recognizing the diverse roles that these groves play in their environments is also essential for developing sustainable environmental management practices. Phytosociological gaps in spatial arrangements and plant community functions hamper a deeper knowledge of sacred grove ecosystems. The complicated linkages between plant species and their ecological roles remain unknown, making it difficult to develop informed conservation policies. Addressing these gaps is critical for sustaining the delicate balance inherent in these ecosystems.

With unexplored historical and cultural linkages and gaps in traditional ecological information recording, cultural relevance arises as a focus point. Sacred groves are living testaments of historical links and cultural practices as well as ecological phenomena. A more thorough investigation of these relationships is required for a full comprehension of the socio-cultural fabric that these groves represent. With its blank canvas of microclimates and soil compositions, ecological knowledge encourages ecologists and environmental scientists to create a full picture of these ecosystems. A mosaic of interrelated materials shapes the life of sacred groves beyond the gaps. Here, research efforts serve as paintbrush, exposing the intricate interactions between climate, soil, and habitat functions. The information gathered has the potential to influence long-term environmental practices, creating a symbiotic relationship between human activities and the fragile balance of these sacred settings. Phytosociological study unfolds as a complex dance of plants, ready for researchers to participate in. The resilience of these environments is orchestrated by a dance of spatial configurations and functions. Understanding

these patterns creates a score for conservationists in the symphony of nature, motivating them to pursue educated methods that safeguard the survival and development of sacred groves. The cultural importance chapters serve as a narrative link between the physical and the intangible. Anthropologists and historians are being invited to cross this bridge and investigate the stories entwined in the historical and cultural linkages of sacred trees. The gaps ring out an urgent call for legal experts, policymakers, and environmentalists to work together to create a symphony of legal protections. It is a plea for legal frameworks that balance sacred grove preservation with the changing needs of communities and ecosystems, generating a legal environment that promotes rather than suffocates cultural and ecological variety.

Chapter IV

MATERIALS AND METHODS

4.1. Survey of sacred groves of Palakkad District, Kerala State.

The present comprehensive study is based on literature collection of all available sacred groves of Palakkad district from the Social Forestry Department of District Forest Office, Revenue offices and the floristic estimation of the sacred groves of Palakkad District. Several botanical surveys and explorations are conducted during the period of study (2019 November to 2023 March). The survey conducted on the sacred groves of Pattambi, Ottapalam, Alathur, Chittur, Palakkad and Mannarkkad taluks of Palakkad district. Information including exact location, diety, ownership of sacred groves were collected from various sources such as local body representatives, local peoples, Village men, Devaswom board authorities, Temple Authorities, local libraries and others.

The sacred groves of various taluks we identified and located, photographs of sacred groves and plants were taken when permitted. Habitat and topographical details of these areas were also noted to differentiate nature of observed floras of different edaphic regions. A location map indicating sacred groves was prepared. Samples of different species including vegetative, flowers and fruits were collected when permitted by the authorities. Additional information was also collected from related offices.

4.2. Collection and identification of plants from sacred groves

Collection and Photography are strictly banned in majority of sacred groves. However visited every sacred groves during different seasons and their floristic composition was noted. There were herbs, shrubs, trees, climbers, epiphytes and parasites are noted. Field data including colour of the flower, exudation, fragrance, etc. were recorded in the field data book. The specimens collected were identified by using the standard floras and also by using other available literature. Plant identification was done on the basis of spot identification method with the help of *Flora of Presidency of Madras* (Gamble 1915-1936) and *Flora of Palghat* (Vajravelu 1998). Further confirmation was done with the help of taxonomic experts. The identification validated by comparing the herbarium

available at Botanical survey of India (BSI), Coimbatore (MH), Calicut University (CALI) and Kerala Forest Research Institute (KFRI).

4.3. Arrangement of voucher herbarium specimens

The fine specimens of different plant species collected from various sacred groves were used to prepare herbarium specimens based on standard herbarium techniques (Jain and Rao, 1977 and Hansen *et al.*, 1991), and arranged according to Bentham and Hooker's system of classification and one set deposited in Sreekrishna College Herbarium Ariyannur, Thrissur.

4.4. Identification of IUCN Red listed Species

The study was focused on Angiosperms and their habit, habitat, phenology, distribution and other identifiable morphological characters were observed along the survey. Endangered, Vulnerable, Near threatened and Least concern plants were categorized by comparing with relevant literature and the data from Ravikumar *et al.*, (2000) , IUCN (2014) and IUCN (2022). Numerous Medicinal, endemic, Ornamental, Sacred and Exotic plants were listed and their importance in biodiversity conservation was analyzed.

4.5. Medicinal and other importance

Flora within the sacred groves are recognized and its medicinal uses in various systems of medicines like Ayurveda, Sidha, Folk, Unani, Alopathy, etc. were studied. These medicinal plants collected from sacred groves were refered through the works of Warrier *et al.*, (1994); Oommen *et al.*, (2000) and Udayan and Balachandran (2009).

4.6. Ecological investigations of sacred groves

Naturally sacred groves are very significant place of in-situ conservation. Key stone species were also recognized from certain groves. Various kinds of birds, insects, rodents, worms, butterflies and small mammals depend somewhat for their food on various flowers, fruits, tubers of these sacred groves.

As of now sacred groves were on the edge of obliteration fundamentally due to man made tensions. Threats were identified, studied and appropriate protection measures were recommended.

4.7. Phytosociological studies in selected sacred groves

Phytosociology portrayed by its extra ordinary vegetation, classification, relationships and distribution of plant networks was analyzed here on selected sacred groves. Quantitative characters i.e, dominance, dencity, frequency, etc. are studied with relevant documentation.

Phytosociological investigations were conducted in six sacred groves with larger area, rich in biodiversity and without restrictions for entry viz. Parakkattukavu (Alathur Taluk), Ethanur Pandalangatt Kavu (Chitur taluk), Thiruvalathur Ayyappan Kavu (Palakkad taluk), Athippatta Mana Nagakanya Kshethram (Mannarkkad Taluk), Pathirakunnath Mana (Ottapalam Taluk) and Cholakkavu Siva Kshethram (Pattambi taluk).

Phytosociological analysis by quadrate method was also directed for portraying the structural features. Arbitrarily chose quadrates of size 20m X 20m in selected sacred groves were utilized for the review. The limits of quadrats were marked using iron sticks and ropes. Each quadrate was then methodically surveyed by distinguishing and all trees with girth at breast height (gbh) greater than and equal to 30 cm were documented for study. Tree girth estimations were made as per Poffenberger *et al.,* (1992). These data accumulated from different plots are analysed using phytosocilogical criterias. From this, quantitative attributes like abundance, density, relative dencity, frequency, relative frequency, relative basal area and importance value index were determined.

Diversity index is a proportion of diversity which takes into account the number of species present, as well a sthe relative abundance of each species. As species richness and evenness increase, so diversity increases (Simpson, 1949). Diversity indices Simpson's index and Shannon Wiener's function were determined in this study.

Density

Density is the number of individuals of a species in a unit area and calculated from field data can be calculated as follows:

$$\text{Density (D)} = \frac{\text{Total number of individuals of the species in all quadrats}}{\text{Total number of quadrats studied}}$$

Relative density

Relative density is the investigation of mathematical strength of a species in relation to total number of all species. It can be calculated as:

$$\text{Relative Density (RD)} = \frac{\text{Number of individuals of a species}}{\text{Number of individuals of all species}} \times 100$$

Frequency

Frequency is the rate of occurrence of a given species in the sample plots studied and expressed in terms of percentage values (frequency %). This might be deciphered that it is the chance of drawing the species within the sample area in anyone trial and it is the easiest of the quantitative to determine (Greig-Smith, 1964).

$$\text{Frequency (F)} = \frac{\text{Number of quadrats of occurrence}}{\text{Total number of quadrats studied}} \times 100$$

The species well distributed and being recorded in any part of the ecosystem will have frequency 100%. While a species restricted to a certain areas will have low frequency values.

Relative frequency

$$\text{Relative frequency (RF)} = \frac{\text{Number of occurrence of a species}}{\text{Total number of occurrence of all species}} \times 100$$

Abundance

Abundance is the number of individuals per quadrat of occurrence. It gives an expression of the relative number of individuals of each species in the vegetation of an area (Bharucha and Deleuw, 1957). Abundance is thought in terms of distance between the plants. This can be calculated as follows.

$$\text{Abundance (Ab)} = \frac{\text{Total number of individuals of a species}}{\text{Total number of occurrence of the species}}$$

Basal area

This refers to the ground actually occupied by the stems and helps to determine the dominance and the nature of community. High basal area indicates greater dominance.

$$\text{Basal area of trees} = \pi r^2$$

$$r = \frac{GBH}{2\pi}$$

Relative basal area

Relative basal areas were calculated out of the average diameter of the stem at breast height using the following formulae:

$$\text{Relative basal area (RBA)} = \frac{\text{Basal area of the species}}{\text{Total basal area of all species.}} \times 100$$

Importance value index

Importance value index is used to express dominance and natural achievement of any specie and it provides an generally significance of a species in a community. IVI is derived from three characteristics of vegetation relative frequency, relative density, and relative basal area (Curtis, 1959).

Importance Value Index (IVI) = Relative frequency + Relative Density + Relative basal area.

Biodiversity indices

The primary point of the investigation was to recognize the flora on the forests of sacred groves of Palakkad district, which can be used as a baseline for further scholarly research and for determining the conservation values for management and protection. Floral diversity was evaluated through Simpson's index (Simpson, 1949) and Shannon - Wiener's index (Shannon and Weiner, 1963).

Simpson's index

Simpson's index was the first diversity index used in ecology. The value of this index varies from 0 to 1 and gives the likelihood that two individuals drawn at irregular from a populace belong to the same species. If the probability is high then the diversity of the community sampled is low.

$$D = 1 - \sum_{I-1}^{S} Pi^2$$

Where $Pi = \frac{nI}{N}$

nI = Number of individuals of each species.

N = Total number of individuals in the plot.

S = Number of species in the plot.

D = Diversity.

Shannon - Wiener's index

Shannon - Wiener's index (H') relies upon tree abundance and distribution among the species. It is maximum when the species have same number of individuals and minimum when maximum individuals in one species.

4.8 Investigation about Ecologically niched plants.

The plants having ecological importance in its ecological nisches are identified with the help of taxonomic and ecological experts. And further investigation was done on their specific importance in certain sacred groves.

Chapter V

RESULTS

5.1. **A Comprehensive study of the sacred groves of Palakkad District.**

The present study were conducted in 70 sacred groves at six Taluks (Alathur, Chittur, Palakkad, Mannarkkad, Ottapalam and Pattambi) of Palakkad district from November 2019 to May 2023. The detailed survey resulted in the collection of 529 species including two gymnosperms. An elaborate description and herbarium specimens were prepared. Ecological and phytosociological studies were conducted in six sacred groves such as, Parakkattukavu Bhagavathi Kshethram (Kavassery, Alathur), Ethanur Pandalangatt Sarpakkavu (Koduvayur, Chittur), Thiruvalathur Ayyappan Kavu (Kodumbu,Palakkad), Athippattamana Nagakanya Kshethram (Thachanattukara, Mannarkkad) Pathirakunnathumana (Chalavara, Ottapalam) and Cholakkavu Siva Kshethram (Thiruvegappura, Pattambi).

The sacred groves were studied in Puthukkode, Kottayi, Kavassery, Peringottukurussy, grama panchayath in Alathur taluk; Nenmara, Elevenchery, Kollengode, Vadavannur, Koduvayur grama panchayath in Chittur taluk; Kannadi, Kodumbu, Keralassery, Kongad gramapanchayath in Palakkad taluk; Kanjirapuzha, Thachanattukara, Alanellur gramapanchayath in Mannarkkad taluk; Lakkidi-Perur, Chalavara, Nellaya, Sreekrishnapuram, Vellinezhi gramapanchayath in Ottapalam taluk and Nagalassery, Chalissery, Pattithara, Anakkara, Pattambi, Muthuthala, Thiruvegappura, Koppam, Vallapuzha gramapanchayath in Pattambi taluk.

Out of 529 species collected from the sacred grove vary its size and deities worshipped were different but all of these groves were protected on behalf of religious beliefs. From the present study most of the groves are under the control of family members or local communities. Some of them are coming under Malabar Devaswom Board. Some of the groves were protected with compound walls or wired fence. In majority of groves the deity is Nagam. Large area was present in Parakkattu Kavu, situated in Kavassery, Alathur taluk and its area 10.12 ha (Under Malabar Devaswom Board)

These groves have distinct floral characters making it unique ecosystem. These are rich in biodiversity and native vegetation contains IUCN red listed species of plants. Floral wealth also includes medicinally and economically important plant species. Common diseases like fever, cold, swelling, itching, *etc.* are treated by using different plant species and are used in different systems of medicines like Ayurveda, Folk, Homeopathy, Unani, Sidha, *etc.* Different parts of plants such as leaves, roots, bark, latex, inflorescence, fruits, seeds and sometimes the whole plants are used for different medical purposes.

Some groves were associated with water bodies such as rivers,ponds, wells, *etc.* They are valuable and help to preserve rain water, maintain water table throughout the year, decrease drought problems in that particular area and helps to water recharging in the nearby areas.

Most of the groves are situated near human inhabitation and these affect the proper maintenance of biodiversity inside. Majority groves entry inside was prohibited due to religious belief.

5.1.1. Taxonomical studies in sacred groves of Palakkad district

The present studies of flowering plants and gymnosperms from 70 sacred groves of Palakkad district begun from November 2019 to May 2023 and a total of 527 species of angiosperms and 2 species of gymnosperm (*Cycas circinalis* L., *Gnetum edule* (Willd.) Blume) were recognized belonging to 377 genera and 115 families. The flora of sacred groves in Palakkad district contains 181 herbs (34.21%), 119 shrubs (22.49%), 74 climbers (13.98%) and 155 trees (29.30%) (Table. 2).

Table.2. Checklist of flowering plants reported from the 70 sacred groves of Palakkad district

Sl. No.	Coll. No.	Botanical name	Family	Habit
1.		*Abelmoschus manihot* (L.) Medik.	Malvaceae	Climber
2.	214	*Abrus precatorius* L.	Fabaceae	Climber
3.		*Abrus pulchellus* Wall. ex Thwaites.	Fabaceae	Herb
4.		*Abutilon guineense* (Schumach.) Baker f. & Exell.	Malvaceae	Shrub
5.	150	*Acacia auriculiformis* Benth.	Mimosaceae	Herb
6.	78	*Acacia mangium* Willd.	Mimosaceae	Tree
7.		*Acacia torta* (Roxb.) Craib.	Mimosaceae	Tree
8.		*Acalypha capitata* Willd.	Euphorbiaceae	Shrub
9.		*Acalypha fruticosa* Forssk.	Euphorbiaceae	Shrub
10.	119	*Acalypha indica* L.	Euphorbiaceae	Shrub
11.		*Acampe ochracea* (Lindl.) Hochr.	Orchidaceae	Herb
12.		*Acampe praemorsa* (Roxb.) Blatt. & McCann.	Orchidaceae	Shrub
13.	82	*Acanthospermum hispidum* DC.	Asteraceae	Herb
14.	7	*Achyranthes aspera* L.	Amaranthaceae	Herb
15.	140	*Acmella calva* (DC.) R.K. Jansen.	Asteraceae	Herb
16.		*Adenanthera pavonina* L.	Mimosaceae	Tree
17.		*Adenia hondala* (Gaertn.) de Wilde.	Passifloraceae	Climber
18.		*Adina cordifolia* (Roxb.) Hook. f.	Rubiaceae	Tree
19.	172	*Aeginetia indica* L.	Orobanchaceae	Herb
20.		*Aegle marmelos* (L.) Correa.	Rutaceae	Tree
21.	39	*Aerva lanata* (L.) Juss. ex Schult.	Amaranthaceae	Herb
22.		*Aeschynomene americana* L.	Fabaceae	Shrub
23.		*Aganope thyrsiflora* (Benth.) Polhil.	Fabaceae	Herb
24.	52	*Ageratum conyzoids* L.	Asteraceae	Herb
25.	184	*Aglaia elaeagnoidea* (A. Juss.) Benth.	Meliaceae	Herb
26.		*Ailanthus triphysa* (Dennst.) Alston.	Simaroubaceae	Tree
27.		*Alangium salviifolium* (L.f.) Wang.	Alangiaceae	Tree
28.		*Albizia chinensis* (Osbeck) Merr., Amer.	Mimosaceae	Tree
29.		*Albizia lebbeck* (L.) Benth.	Mimosaceae	Tree
30.	4	*Albizia odoratissima* (L. f.) Benth.	Mimosaceae	Tree
31.		*Allamanda cathartica* L.	Apocynaceae	Shrub
32.	56	*Allophylus serratus* (Roxb.) Kurz.	Sapindaceae	Shrub
33.	70	*Alstonia scholaris* (L.) R. Br.	Apocynaceae	Tree

Sl. No.	Coll. No.	Botanical name	Family	Habit
34.	31	*Alternanthera bettzickiana* (Regel) Voss.	Amaranthaceae	Herb
35.		*Alternanthera brasiliana* (L.) Kuntze.	Amaranthaceae	Herb
36.	177	*Alysicarpus vaginalis* (L.) DC..	Fabaceae	Climber
37.		*Amaranthus spinosus* L.	Amaranthaceae	Herb
38.	48	*Amorphophallus paeoniifolius* (Dennst.) Nicolson.	Araceae	Herb
39.		*Ampelocissus indica* (L.) Planch.	Vitaceae	Climber
40.	46	*Anacardium occidentale* L.	Anacardiaceae	Tree
41.		*Anamirta cocculus* (L.) Wight & Arn.	Menispermaceae	Tree
42.		*Ananas comosus var. bracteatus* (Lindl.) Coppens & F. Leal.	Bromeliaceae	Shrub
43.	36	*Andrographis echioides* (L.) Nees.	Acanthaceae	Herb
44.		*Andrographis lawsonii* Gamble.	Acanthaceae	Herb
45.	30	*Andrographis paniculata* (Burm. f.) Wall. ex Nees.	Acanthaceae	Herb
46.		*Anisochilus carnosus* (L. f.) Wall. ex Benth.	Lamiaceae	Climber
47.		*Annona muricata* L.	Annonaceae	Tree
48.	8	*Annona reticulata* L.	Annonaceae	Tree
49.		*Annona squamosa L.*	Annonaceae	Tree
50.		*Anthocephalus cadamba* (Roxb.) Miq.	Rubiaceae	Tree
51.		*Antiaris toxicaria* Lesch.	Moraceae	Tree
52.		*Antidesma acidum* Retz., Obs.	Euphorbiaceae	Herb
53.		*Aphanamixis polystachya* (Wall.) R. Parker.	Meliaceae	Tree
54.	68	*Apluda mutica* L.	Poaceae	Herb
55.		*Aporosa cardiosperma* (Gaertn.) Merr.	Euphorbiaceae	Shrub
56.		*Aquilaria malaccensis* Lam.	Thymelaeaceae	Tree
57.	221	*Areca catechu* L.	Arecaceae	Tree
58.		*Argemone mexicana* L.	Papavaraceae	Herb
59.		*Argyreia bracteata* Choisy.	Convolvulaceae	Climber
60.		*Aristolochia indica* L.	Aristolochiaceae	Herb
61.		*Aristolochia ringens* Vahl.	Aristolochiaceae	Shrub
62.	6	*Artocarpus heterophyllus* Lam.	Moraceae	Tree
63.	5	*Artocarpus hirsutus* Lam.	Moraceae	Tree
64.		*Asparagus racemosus*, Willd.	Liliaceae	Herb
65.	105	*Azadirachta indica* A. Juss.	Meliaceae	Tree

Sl. No.	Coll. No.	Botanical name	Family	Habit
66.		*Bambusa bambos* (L.) Voss.	Poaceae	Shrub
67.		*Bambusa vulgaris* Schrad.	Poaceae	Herb
68.	74	*Barleria cristata* L.	Acanthaceae	Shrub
69.		*Barleria prionitis* L.	Acanthaceae	Shrub
70.		*Bauhinia acuminata* L.	Caesalpiniaceae	Shrub
71.		*Bauhinia purpurea* L.	Caesalpiniaceae	Tree
72.	142	*Bauhinia tomentosa* L.	Caesalpiniaceae	Shrub
73.	3	*Bauhinia variegata* L.	Caesalpiniaceae	Tree
74.		*Benkara malabarica* (Lam.) Tirveng.	Rubiaceae	Shrub
75.		*Biancaea sappan* (L.) Thod.	Caesalpiniaceae	Tree
76.	23	*Biophytum reinwardtii* (Zucc.) Klotzsch.	Oxalidaceae	Herb
77.	225	*Bixa orellana* L.	Bixaceae	Tree
78.		*Blepharis maderaspatensis* (L.) Heyne ex Roth.	Acanthaceae	Herb
79.		*Blumea belangeriana* DC.	Asteraceae	Herb
80.		*Blumea lacera* (Burm. f.) DC.	Asteraceae	Herb
81.		*Blumea laevis* (Lour.) Merr.	Asteraceae	Shrub
82.		*Blumea oxyodonta* DC.	Asteraceae	Herb
83.	203	*Boerhavia diffusa* L.	Nyctaginaceae	Herb
84.		*Bombax ceiba* L.	Bombacaceae	Tree
85.		*Bonnaya ciliata* (Colsm.) Spreng.	Scrophulariaceae	Herb
86.		*Borassus flabellifer* L.	Arecaceae	Tree
87.		*Breynia androgyna* (L.) Chakarb. & N.P. Balakr.	Euphorbiaceae	Tree
88.		*Breynia quadrangularis* (Klein ex Willd) Chakarb. & N.P. Balakr.	Euphorbiaceae	Shrub
89.		*Breynia retusa* (Dennst.) Alston.	Euphorbiaceae	Shrub
90.	192	*Breynia vitis-idaea* (Burm. f.) C.E.C. Fisch.	Euphorbiaceae	Shrub
91.	197	*Bridelia retusa* (L.) A. Juss.	Euphorbiaceae	Tree
92.	104	*Bridelia stipularis* (L.) Blume	Euphorbiaceae	Tree
93.		*Bryophyllum pinnatum* (Lam.) Kurz.	Crassulaceae	Herb
94.		*Butea monosperma* (Lam.) Taub.	Fabaceae	Herb
95.		*Caesalpinia pulcherrima* (L.) Swartz.	Caesalpiniaceae	Shrub
96.	55	*Caladium bicolor* (Ait. ex Dryand.) Vent.	Araceae	Herb
97.		*Calophyllum apetalum* Wild.	Clusiaceae	Tree
98.		*Calophyllum inophyllum* L.	Clusiaceae	Tree
99.	141	*Calotropis gigantea* (L.) Dryand.	Asclepiadaceae	Shrub

Sl. No.	Coll. No.	Botanical name	Family	Habit
100.	112	*Camonea umbellata* (L.) A.R. Simoes & Staoles.	Convolvulaceae	Climber
101.	123	*Camonea vitifolia* (Burm.f.)A.R. Simoes & Staoles.	Convolvulaceae	Climber
102.	86	*Canscora diffusa* (Vahl) R. Br. ex Roem. & Schult.	Gentianaceae	Tree
103.		*Cansjera rheedei* Gmel.	Opiliaceae	Climber
104.		*Canthium angustifolium* Roxb.	Rubiaceae	Shrub
105.		*Canthium coromandelicum* (Burm. f.) Alston.	Rubiaceae	Shrub
106.		*Canthium rheedei* DC.	Rubiaceae	Shrub
107.		*Capparis zeylanica* L.	Capparaceae	Shrub
108.		*Capsicum frutescens* L.	Solanaceae	Shrub
109.		*Carallia brachiata* (Lour.) Merr.	Rhizophoraceae	Tree
110.	151	*Cardiospermum halicacabum* L.	Sapindaceae	Herb
111.	187	*Carica papaya* L.	Caricaceae	Tree
112.		*Caryota urens* L.	Arecaceae	Tree
113.		*Cascabela thevetia* (L.) Lippold.	Apocynaceae	Shrub
114.		*Casearia wynadensis* Bedd.	Flacourtiaceae	Herb
115.	118	*Cassia fistula* L.	Caesalpiniaceae	Tree
116.		*Casuarina equisetifolia* L.	Casuarinaceae	Tree
117.		*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	Tree
118.	2	*Causonis trifolia* (L.) Planch.	Vitaceae	Climber
119.	92	*Cayratia pedata* (Lam.) A. Juss. ex Gagnep.	Vitaceae	Shrub
120.		*Ceiba pentandra* (L.) Gaertn.	Bombacaceae	Tree
121.		*Cenchrus pedicellatus* (Trin.) Morrone.	Poaceae	Herb
122.	143	*Centella asiatica* (L.) Urb.	Apiaceae	Herb
123.	83	*Centrosema molle* Benth.	Fabaceae	Tree
124.		*Cereus pterogonus* Lam.	Cactaceae	Shrub
125.		*Ceropegia candelabrum* L. var. *biflora* (L.) M.Y. Ansari.	Asclepiadaceae	Herb
126.	100	*Chassalia curviflora* (Wall. ex Kurz) Thwaites.	Rubiaceae	Shrub
127.		*Chionanthus mala-elengi* (Dennst.) P. S. Green.	Oleaceae	Tree
128.	186	*Chromolaena odorata* (L.) King & H. Rob.	Asteraceae	Shrub
129.	34	*Chrysophyllum cainito* L.	Sapotaceae	Tree

Sl. No.	Coll. No.	Botanical name	Family	Habit
130.		*Chrysophyllum oliviforme* L.	Sapotaceae	Tree
131.		*Chrysopogon aciculatus* (Retz.) Trin.	Poaceae	Herb
132.		*Cinnamomum malabatrum* (Burm. f.) Blume.	Lauraceae	Herb
133.	21	*Cinnamomum verum* Presl.	Lauraceae	Tree
134.		*Cissampelos pareira* L.	Menispermaceae	Climber
135.		*Cissus arnottiana* B.V. Shetty & P. Singh.	Vitaceae	Climber
136.	69	*Cissus heyneana* Steud.	Vitaceae	Shrub
137.	139	*Cissus latifolia* Lam.	Vitaceae	Shrub
138.		*Citharexylum spinosum* L.	Verbenaceae	Tree
139.		*Citrus limon (*L.) Burm.f.	Rutaceae	Tree
140.		*Citrus medica* L.	Rutaceae	Tree
141.	88	*Cleistanthus collinus* (Roxb.) Benth. ex Hook. f.	Euphorbiaceae	Tree
142.		*Clematis zeylanica* (L.) Poir.	Ranunculaceae	Climber
143.		*Cleome rutidosperma* DC.	Capparaceae	Herb
144.	93	*Cleome viscosa* L.	Capparaceae	Herb
145.	158	*Clerodendrum infortunatum* L.	Verbenaceae	Shrub
146.	120	*Clerodendrum paniculatum* L.	Verbenaceae	Shrub
147.		*Clinacanthus nutans* (Burm. f.) Lindau.	Acanthaceae	Shrub
148.	160	*Clitoria ternatea* L.	Fabaceae	Climber
149.	33	*Coccinia grandis* (L.) Voight.	Cucurbitaceae	Shrub
150.		*Cocos nucifera* L.	Arecaceae	Tree
151.		*Coffea travancorensis* Wight & Arn.	Rubiaceae	Shrub
152.		*Colocasia esculenta* (L.) Schott.	Araceae	Herb
153.	135	*Combretum albidum* G. Don.	Combretaceae	Climber
154.	179	*Combretum indicum* (L.) De. Philipps.	Combretaceae	Climber
155.		*Combretum latifolium* Blume.	Combretaceae	Climber
156.		*Commelina benghalensis* L.	Commelinaceae	Herb
157.	45	*Commelina clavata* C.B. Clarke.	Commelinaceae	Herb
158.		*Connarus monocarpus* L.	Connaraceae	Shrub
159.	41	*Corchorus aestuans* L.	Tiliaceae	Herb
160.		*Cordia wallichi* G. Don.	Boraginaceae	Tree
161.		*Corypha umbraculifera* L.	Arecaceae	Tree
162.		*Cosmostigma cordatum* (Poir.) M.R. Almeida.	Asclepiadaceae	Shrub
163.		*Couroupita guianensis* Aubl.	Lecythidaceae	Tree

Sl. No.	Coll. No.	Botanical name	Family	Habit
164.		*Crateva religiosa* G. Forst.	Capparaceae	Tree
165.	54	*Crepidium resupinatum* (G.Forst) Szzlach.	Orchidaceae	Herb
166.	42	*Crossandra infundibuliformis* (L.) Nees.	Acanthaceae	Shrub
167.		*Crotalaria heyneana* Graham ex Wight & Arn.	Fabaceae	Climber
168.		*Crotalaria pallida* Dryand.	Fabaceae	Shrub
169.	121	*Crotalaria retusa* L.	Fabaceae	Shrub
170.		*Crotalaria verrucosa* L.	Fabaceae	Herb
171.		*Cryptolepis buchananii* Roem. & Schult.	Periplocaceae	Climber
172.	134	*Cucumis maderaspatanus* L.	Cucurbitaceae	Climber
173.	215	*Curculigo orchioides* Gaertn.	Hypoxidaceae	Herb
174.		*Curcuma aeruginosa* Roxb.	Zingiberaceae	Herb
175.		*Curcuma aurantiaca* Zijp.	Zingiberaceae	Herb
176.		*Curcuma longa* L.	Zingiberaceae	Herb
177.		*Cyanotis axillaris* (L.) D. Don.	Commelinaceae	Herb
178.	146	*Cyanotis cristata* (L.) D. Don.	Commelinaceae	Herb
179.	166	*Cyanthillium cinerum*(DC) H.Rob.	Asteraceae	Herb
180.	13	*Cyathula prostrata* (L.) Blume.	Amaranthaceae	Herb
181.		*Cycas circinalis* L.	Cycadaceae	Shrub
182.		*Cyclea fissicalyx* Dunn.	Menispermaceae	Climber
183.	53	*Cyclea peltata* (Lam.) Hook. f. & Thoms.	Menispermaceae	Climber
184.		*Cymbopogon flexuosus* (Nees ex Steud.) Wats.	Poaceae	Herb
185.	185	*Cynanchum callialatum* Ham. ex Wight	Asclepiadaceae	Climber
186.	1	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb
187.		*Cyperus castaneus* Willd.	Cyperaceae	Herb
188.		*Cyperus compressus* L.	Cyperaceae	Herb
189.		*Cyperus iria* L.	Cyperaceae	Herb
190.		*Cyperus mindorensis* (Steud.) Huygh.	Cyperaceae	Herb
191.	211	*Cyrtococcum trigonum* (Retz.) A. Camus.	Poaceae	Herb
192.		*Dactyloctenium aegyptium* (L.) P. Beauv.	Poaceae	Herb
193.		*Dalbergia horrida* (Dennst.) Mabb.	Fabaceae	Herb
194.		*Dalbergia lanceolaria* L.	Fabaceae	Climber

Sl. No.	Coll. No.	Botanical name	Family	Habit
195.		*Dalbergia latifolia* Roxb.	Fabaceae	Tree
196.		*Dalbergia sissoides* Graham ex Wight & Arn.	Fabaceae	Tree
197.		*Dalbergia volubilis* Roxb.	Fabaceae	Tree
198.		*Delonix regia* (Boj. ex Hook) Rafin.	Caesalpiniaceae	Tree
199.	101	*Dendrophthoe falcata* (L. f.) Ettingsh.	Loranthaceae	Climber
200.		*Derris scandens* (Roxb.) Benth.	Fabaceae	Climber
201.	170	*Desmodium scorpiurus* (Sw.) Desv.	Fabaceae	Climber
202.		*Dicliptera foetida* (Forssk.) Blatt.	Acanthaceae	Shrub
203.		*Dioscorea alata* L.	Dioscoreaceae	Climber
204.	216	*Dioscorea bulbifera* L.	Dioscoreaceae	Climber
205.		*Dioscorea esculenta* (Lour.) Burkill.	Dioscoreaceae	Climber
206.		*Dioscorea hispida* Dennst.	Dioscoreaceae	Climber
207.		*Dioscorea oppositifolia* L.	Dioscoreaceae	Climber
208.		*Dioscorea pentaphylla* L.	Dioscoreaceae	Climber
209.		*Diospyros montana* Roxb.	Ebenaceae	Tree
210.		*Diospyros peregrina* (Gaertn.) Gurke.	Ebenaceae	Tree
211.		*Diploclisia glaucescens* (Blume) Diels.	Menispermaceae	Climber
212.	87	*Diplocyclos palmatus* (L.) Jeffrey.	Cucurbitaceae	Climber
213.		*Drymaria cordata* (L.) Willd. ex Roem. & Schult.	Caryophyllaceae	Herb
214.		*Drypetes sepiaria* (Wight & Arn.) Pax & K. Hoffm.	Euphorbiaceae	Tree
215.		*Dysphania ambrosioides* (L.) Mosyakin & Clemants.	Chenopodiaceae	Herb
216.		*Ecbolium viride* (Forssk.) Alston.	Acanthaceae	Shrub
217.		*Echinochloa colona* (L.) Link	Poaceae	Herb
218.		*Eclipta prostrata* (L.) L.	Asteraceae	Herb
219.		*Ehretia microphylla* Lam.	Boraginaceae	Shrub
220.	10	*Elephantopus scaber* L.	Asteraceae	Herb
221.		*Eleusine indica* (L.) Gaertn.	Poaceae	Herb
222.	136	*Eleutheranthera ruderalis* (Sw.) Sch.-Bip.	Asteraceae	Herb
223.		*Embelia tsjeriam-cottam* (Roem. & Schult.) DC.	Myrsinaceae	Shrub
224.		*Emilia scabra* DC.	Asteraceae	Herb
225.	176	*Emilia sonchifolia* (L.) DC.	Asteraceae	Herb
226.		*Eranthemum capense* L.	Acanthaceae	Herb

Sl. No.	Coll. No.	Botanical name	Family	Habit
227.		*Erythrina variegata L.*	Fabaceae	Herb
228.		*Erythroxylum monogynum* Roxb.	Erythroxylaceae	Shrub
229.	61	*Euphorbia hirta* L.	Euphorbiaceae	Herb
230.	62	*Euphorbia thymifolia* L.	Euphorbiaceae	Herb
231.		*Euphorbia tithymaloides* L.	Euphorbiaceae	Shrub
232.		*Evolvulus alsinoides* (L.) L.	Convolvulaceae	Herb
233.		*Fagraea ceilanica* Thunb.	Loganiaceae	Climber
234.		*Ficus amplissima* J. E. Smith.	Moraceae	Tree
235.	206	*Ficus benghalensis* L.	Moraceae	Tree
236.	27	*Ficus exasperata* Vahl.	Moraceae	Tree
237.	106	*Ficus hispida* L. f.	Moraceae	Tree
238.		*Ficus krishnae* C.DC.	Moraceae	Tree
239.		*Ficus microcarpa* L. f.	Moraceae	Tree
240.	22	*Ficus racemosa* L.	Moraceae	Tree
241.	163	*Ficus religiosa* L.	Moraceae	Tree
242.	60	*Ficus tsjakela* Burm. f.	Moraceae	Tree
243.		*Ficus virens* Ait.	Moraceae	Tree
244.		*Fimbristylis aestivalis* Vahl.	Cyperaceae	Herb
245.		*Flacourtia indica* (Burm. f.) Merr.	Flacourtiaceae	Tree
246.		*Flueggea leucopyrus* Willd.	Euphorbiaceae	Shrub
247.		*Flueggea virosa* (Roxb. ex Willd.) Voigt, Hort.	Euphorbiaceae	Shrub
248.	11	*Garcinia gummi-gutta* (L.) Roxb.	Clusiaceae	Tree
249.		*Gardenia jasminoides* Ellis.	Rubiaceae	Shrub
250.		*Garuga pinnata* Roxb.	Burseraceae	Tree
251.		*Geophila repens* (L.) Johnst.	Rubiaceae	Herb
252.	50	*Getonia floribunda* Roxb.	Combretaceae	Climber
253.	220	*Gliricidia sepium* (Jacq.) Kunth ex Walp.	Fabaceae	Tree
254.	210	*Gloriosa superba* L.	Liliaceae	Climber
255.	122	*Glycosmis pentaphylla* (Retz.) DC.	Rutaceae	Shrub
256.		*Gmelina arborea* Roxb.	Verbenaceae	Tree
257.		*Gmelina asiatica* L.	Verbenaceae	Shrub
258.	181	*Gnetum edule* (Willd.) Blume.	Gnetaceae	Herb
259.	66	*Grewia abutilifolia* Vent. ex Juss.	Tiliaceae	Shrub
260.	194	*Grewia tiliifolia* Vahl.	Tiliaceae	Tree
261.		*Grona heterocarpa* (L.) H. Ohashi & K. Ohashi.	Fabaceae	Tree
262.		*Grona heterophylla* (Willd.) H.	Fabaceae	Herb

Sl. No.	Coll. No.	Botanical name	Family	Habit
		Ohashi & K. Ohashi.		
263.		*Grona triflora* (L.) H. Ohashi & K. Ohashi.	Fabaceae	Herb
264.	198	*Helicanthes elastica* (Desr.) Danser.	Loranthaceae	Shrub
265.		*Helicteres isora* L.	Sterculiaceae	Shrub
266.		*Heliotropium indicum* L.	Boraginaceae	Herb
267.	29	*Hellenia speciosa* (Koenig) S.R. Dutta.	Zingiberaceae	Herb
268.	126	*Hemidesmus indicus* (L) R.Br.	Periplocaceae	Climber
269.		*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult.	Poaceae	Herb
270.		*Hewittia malabarica* (L.) Suresh.	Convolvulaceae	Herb
271.	153	*Hibiscus hispidissimus* Griff.	Malvaceae	Shrub
272.	113	*Hibiscus rosa-sinensis* L.	Malvaceae	Shrub
273.	195	*Hibiscus sabdariffa* L.	Malvaceae	Shrub
274.		*Hibiscus schizopetalus* (Mast.) Hook. f.	Malvaceae	Shrub
275.		*Hiptage benghalensis* (L.) Kurz.	Malpighiaceae	Tree
276.	71	*Holarrhena pubescens* (Buch.-Ham.) Wall. ex G. Don.	Apocynaceae	Tree
277.		*Holigarna arnottiana* Hook.f.	Anacardiaceae	Tree
278.		*Holoptelea integrifolia* (Roxb.) Planch.	Ulmaceae	Tree
279.		*Hopea parviflora* Bedd.	Dipterocarpacea e	Tree
280.	167	*Hopea ponga* (Dennst.) Mabb.	Dipterocarpacea e	Tree
281.		*Hultholia mimosoides* (Lam.) Gagnon & G.P. Lewis.	Caesalpiniaceae	Shrub
282.	19	*Hydnocarpus pentandrus* (Buch.-Ham.) Oken.	Flacourtiaceae	Shrub
283.		*Hydrolea zeylanica* (L.) Vahl.	Hydrophyllaceae	Herb
284.	73	*Ichnocarpus frutescens* (L.) R.Br.	Apocynaceae	Climber
285.		*Imperata cylindrica* (L.) Raeusch.	Poaceae	Herb
286.		*Indigofera astragalina* DC.	Fabaceae	Herb
287.	24	*Indigofera hirsuta* L.	Fabaceae	Herb
288.		*Indigofera tsiangiana* Metcalf.	Fabaceae	Herb
289.	182	*Ipomoea aquatica* Forssk.	Convolvulaceae	Climber
290.	209	*Ipomoea cairica* (L.) Sweet.	Convolvulaceae	Herb
291.	109	*Ipomoea hederifolia* L.	Convolvulaceae	Climber
292.		*Ipomoea marginata* (Desr.) Verdc. f.	Convolvulaceae	Climber

Sl. No.	Coll. No.	Botanical name	Family	Habit
		candida (Naik & Zate) Das & Lakshmin.		
293.		*Ipomoea obscura (L.)* Ker-Gawl.	Convolvulaceae	Climber
294.	85	*Ipomoea pes-tigridis* L.	Convolvulaceae	Herb
295.		*Ipomoea staphylina* Roem. & Schult.	Convolvulaceae	Climber
296.		*Ixora brachiata* Roxb. ex DC.	Rubiaceae	Tree
297.	9	*Ixora coccinea* L.	Rubiaceae	Shrub
298.	191	*Ixora javanica* (Blume) DC.	Rubiaceae	Shrub
299.		*Ixora malabarica* (Dennst.) Mabb.	Rubiaceae	Shrub
300.	97	*Jasminum angustifolium* (L.) Willd.	Oleaceae	Climber
301.		*Jasminum coarctatum* Roxb.	Oleaceae	Climber
302.		*Jasminum sambac* (L.) Ait.	Oleaceae	Shrub
303.		*Jatropha gossypiifolia* L.	Euphorbiaceae	Shrub
304.	133	*Justicia adhatoda* L.	Acanthaceae	Shrub
305.	132	*Justicia gendarussa* Burm. f.	Acanthaceae	Shrub
306.		*Justicia trinervia* Vahl.	Acanthaceae	Herb
307.		*Justicia wynaadensis* (Nees) Heyne ex T. Anderson.	Acanthaceae	Shrub
308.		*Lagerstroemia microcarpa* Wight.	Lythraceae	Shrub
309.	207	*Lagerstroemia speciosa* (L.) Pers.	Lythraceae	Tree
310.		*Lannea coromandelica* (Houtt.) Merr.	Anacardiaceae	Tree
311.	99	*Lantana camara* L.	Verbenaceae	Shrub
312.		*Lantana splendens* Medic.	Verbenaceae	Shrub
313.		*Laportea interrupta* (L.) Chew.	Urticaceae	Herb
314.	72	*Leea indica* (Burm.f.) Merr.	Leeaceae	Tree
315.	43	*Lepidagathis incurva* Buch.-Ham. ex D.Don	Acanthaceae	Herb
316.		*Leucaena leucocephala* (Lam.) de Wit	Mimosaceae	Tree
317.		*Leucas angularis* Benth.	Lamiaceae	Herb
318.	95	*Leucas aspera* (Willd.) Link.	Lamiaceae	Herb
319.		*Lobelia alsinoides* Lam.	Lobeliaceae	Herb
320.	107	*Ludwigia hyssopifolia* (G. Don) Exell.	Onagraceae	Herb
321.	49	*Luffa cylindrica* (L.) Roem.	Cucurbitaceae	Climber
322.		*Macaranga indica* Wight.	Euphorbiaceae	Tree
323.	25	*Macaranga peltata* (Roxb.) Muell.-Arg.	Euphorbiaceae	Tree
324.		*Madhuca longifolia* (Koenig) Macbr.	Sapotaceae	Tree
325.	201	*Magnolia champaca* (L.) Baill. ex Pierre.	Magnoliaceae	Tree
326.	130	*Mallotus philippensis* (Lam.)	Euphorbiaceae	Tree

Sl. No.	Coll. No.	Botanical name	Family	Habit
		Muell.Arg.		
327.		*Mallotus repandus* (Willd.) Muell.Arg.	Euphorbiaceae	Shrub
328.	63	*Mangifera indica* L.	Anacardiaceae	Tree
329.		*Manihot carthagenensis subsp. glaziovii* (Muell.Arg.) Allem	Euphorbiaceae	Tree
330.		*Manihot esculenta* Crantz.	Euphorbiaceae	Shrub
331.		*Martynia annua* L.	Pedaliaceae	Herb
332.	28	*Melochia corchorifolia* L.	Sterculiaceae	Herb
333.		*Memecylon depressum* Benth. ex Triana.	Melastomataceae	Herb
334.		*Memecylon randerianum* S.M. Almeida & M.R. Almeida.	Melastomataceae	Shrub
335.	89	*Memecylon talbotianum* Brandis.	Melastomataceae	Shrub
336.		*Memecylon umbellatum* Burm. f.	Melastomataceae	Tree
337.	103	*Mesophaerum suaveolens* (L.) Kuntz.	Lamiaceae	Herb
338.		*Mesua ferrea* L.	Clusiaceae	Tree
339.		*Mezoneuron cucullatum* (Roxb.) Wight & Arn.	Caesalpiniaceae	Climber
340.		*Microcos paniculata* L.	Tiliaceae	Shrub
341.		*Microstachys chamaelea* (L.) Muell.-Arg.	Euphorbiaceae	Herb
342.	212	*Mikania micrantha* Kunth.	Asteraceae	Climber
343.		*Miliusa tomentosa* (Roxb.) Finet & Gagnep.	Annonaceae	Tree
344.		*Millingtonia hortensis* L. f.	Bignoniaceae	Tree
345.	188	*Mimosa pudica* L.	Mimosaceae	Tree
346.	90	*Mimusops elengi* L.	Sapotaceae	Tree
347.		*Mitracarpus hirtus* (L.) DC.	Rubiaceae	Herb
348.	145	*Momordica dioica* Roxb. ex Willd.	Cucurbitaceae	Climber
349.		*Monoon longifolium* (Sonn.) B. Xue & R.M.K. Saunders.	Annonaceae	Tree
350.	38	*Morinda pubescens* J. E. Smith	Rubiaceae	Tree
351.		*Mucuna gigantea* (Willd.) DC.	Fabaceae	Herb
352.	205	*Mucuna pruriens* (L.) DC.	Fabaceae	Climber
353.		*Murdannia dimorpha* (Dalz.) Brueck.	Commelinaceae	Herb
354.	12	*Murdannia pauciflora* (G.Briickn.) G.Briickn.	Commelinaceae	Herb
355.	129	*Murdannia spirata* (L.) Brueck.	Commelinaceae	Herb
356.	223	*Murraya koenigii* (L.) Spreng.	Rutaceae	Tree
357.		*Murraya paniculata* (L.) Jack.	Rutaceae	Shrub

Sl. No.	Coll. No.	Botanical name	Family	Habit
358.	116	*Mussaenda frondosa* L.	Rubiaceae	Shrub
359.		*Mussaenda glabrata*(Hook.f.)Hutch. ex Gamble.	Rubiaceae	Shrub
360.		*Myriophyllum oliganthum* (Wight & Arn.) F. v. Muell.	Haloragaceae	Shrub
361.	175	*Naregamia alata* Wight & Arn.	Meliaceae	Tree
362.	102	*Naringi crenulata* (Roxb.) Nicolson.	Rutaceae	Tree
363.		*Nelumbo nucifera* Gaertn.	Nelumbonaceae	Herb
364.		*Neolamarckia cadamba* (Roxb.) Bosser.	Rubiaceae	Tree
365.	144	*Nerium oleander* L.	Apocynaceae	Shrub
366.	224	*Nyctanthes arbor-tristis* L.	Nyctanthaceae	Tree
367.		*Nymphaea nouchali* Burm. f.	Nymphaeaceae	Herb
368.		*Nymphoides hydrophylla* (Lour.) Kuntze.	Menyanthaceae	Climber
369.	152	*Ocimum americanum* L.	Lamiaceae	Shrub
370.		*Ocimum filamentosum* Forssk.	Lamiaceae	Herb
371.	154	*Ocimum tenuiflorum* L.	Lamiaceae	Herb
372.		*Oldenlandia corymbosa* L.	Rubiaceae	Herb
373.	111	*Oplismenus compositus* (L.) P. Beauv.	Poaceae	Herb
374.		*Oroxylum indicum* (L.) Benth. ex Kurz.	Bignoniaceae	Tree
375.		*Osbeckia muralis* Naud.	Melastomataceae	Shrub
376.		*Pandanus kaida* Kurz.	Pandanaceae	Shrub
377.		*Panicum notatum* Retz.	Poaceae	Herb
378.	196	*Paramollugo nudicaulis* (Lam.) Thulin.	Molluginaceae	Herb
379.		*Passiflora edulis* Sims.	Passifloraceae	Climber
380.		*Passiflora foetida* L.	Passifloraceae	Climber
381.	16	*Pavetta indica* L.	Rubiaceae	Tree
382.		*Pavetta tomentosa* Roxb. ex J.E. Smith in Rees.	Rubiaceae	Tree
383.		*Pentanema indicum* (L.) Ling.	Asteraceae	Herb
384.	138	*Peperomia pellucida* (L.) Kunth.	Piperaceae	Herb
385.		*Peperomia leptostachya* Hook. & Arn.	Piperaceae	Herb
386.		*Perotis indica* (L.) Kuntze.	Poaceae	Herb
387.		*Persea macrantha* (Nees) Kosterm.	Lauraceae	Tree
388.	67	*Phaulopsis dorsiflora* (Retz.) Sant.	Acanthaceae	Herb
389.		*Phyla nodiflora* (L.) Greene.	Verbenaceae	Herb

Sl. No.	Coll. No.	Botanical name	Family	Habit
390.	219	*Phyllanthus amarus* Schum. & Thonn.	Euphorbiaceae	Herb
391.	75	*Phyllanthus emblica* L.	Euphorbiaceae	Tree
392.		*Phyllanthus reticulatus* Poir.	Euphorbiaceae	Shrub
393.	128	*Phyllanthus urinaria* L.	Euphorbiaceae	Herb
394.		*Phyllanthus virgatus* G. Forst.	Euphorbiaceae	Herb
395.	174	*Physalis angulata* L.	Solanaceae	Herb
396.	202	*Pigea enneasperma* (L.) P.I. Forst.	Violaceae	Herb
397.	15	*Pilea microphylla* (L.) Liebm.	Urticaceae	Herb
398.	91	*Piper longum* L.	Piperaceae	Shrub
399.	17	*Piper nigrum* L.	Piperaceae	Climber
400.		*Pisonia aculeata* L.	Nyctaginaceae	Shrub
401.		*Pistia stratiotes* L.	Araceae	Herb
402.	189	*Platostoma hispidum* (L.) A.J. Paton.	Lamiaceae	Herb
403.		*Plumbago indica* L.	Plumbaginaceae	Shrub
404.	114	*Plumbago zeylanica* L.	Plumbaginaceae	Shrub
405.		*Plumeria obtusa* L.	Apocynaceae	Tree
406.	217	*Plumeria rubra* L.	Apocynaceae	Tree
407.	156	*Pogostemon purpurascens* Dalz.	Lamiaceae	Herb
408.		*Polygala bolbothrix* Dunn.	Polygalaceae	Herb
409.		*Polytrias indica* (Houtt.) Veldkamp.	Poaceae	Herb
410.	161	*Pongamia pinnata* (L.) Pierre.	Fabaceae	Climber
411.	32	*Ponteria crassipes* Mart.	Pontederiaceae	Herb
412.		*Portulaca oleracea* L.	Portulacaceae	Herb
413.	81	*Pothos scandens* L.	Araceae	Climber
414.	208	*Pouzolzia zeylanica* (L.) Benn.	Urticaceae	Herb
415.		*Pseudanthistiria umbellata* (Hack.) Hook. f.	Poaceae	Herb
416.	14	*Pseudarthria viscida* (L.) Wight & Arn.	Fabaceae	Tree
417.	84	*Psidium guajava* L.	Myrtaceae	Tree
418.		*Pterocarpus marsupium* Roxb.	Fabaceae	Herb
419.		*Pueraria phaseoloides* (Roxb.) Benth.	Fabaceae	Tree
420.		*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Herb
421.	168	*Putranjiva roxburghii* Wall.	Euphorbiaceae	Tree
422.		*Quassia amara L.*	Simaroubaceae	Shrub
423.	64	*Rhinacanthus nasutus* (L.) Kurz.	Acanthaceae	Shrub
424.	110	*Ricinus communis* L.	Euphorbiaceae	Shrub
425.		*Rotheca serrata* (L.) Steane & Mabb.	Verbenaceae	Shrub

Sl. No.	Coll. No.	Botanical name	Family	Habit
426.	200	*Rourea minor* (Gaertn.) Merr.	Connaraceae	Climber
427.	79	*Ruellia prostrata* Poir.	Acanthaceae	Herb
428.	213	*Samadera indica* Gaertn.	Simaroubaceae	Tree
429.		*Samanea saman* (Jacq.) Merr.	Mimosaceae	Herb
430.		*Sansevieria roxburghiana* Schult. & Schult.f.	Dracaenaceae	Herb
431.	157	*Santalum album* L.	Santalaceae	Tree
432.		*Sapindus trifoliatus* L.	Sapindaceae	Tree
433.	44	*Saraca asoca* (Roxb.) de Wilde.	Caesalpiniaceae	Tree
434.	20	*Sarcostigma kleinii* Wight & Arn.	Icacinaceae	Herb
435.		*Scaevola taccada* (Gaertn.) Roxb.	Goodeniaceae	Climber
436.	117	*Schleichera oleosa* (Lour.) Oken.	Sapindaceae	Tree
437.		*Scleromitrion diffusum* (Willd.) R.J. Wang.	Rubiaceae	Herb
438.	193	*Scoparia dulcis* L.	Scrophulariaceae	Herb
439.		*Senna hirsuta* (L.) H.S.I.	Caesalpiniaceae	Herb
440.		*Senna occidentalis* (L.) Link.	Caesalpiniaceae	Herb
441.	65	*Senna tora* (L.) Roxb.	Caesalpiniaceae	Shrub
442.		*Sida acuta* Burm. f.	Malvaceae	Shrub
443.		*Sida alnifolia* L.	Malvaceae	Herb
444.		*Sida beddomei* Jacob, J.	Malvaceae	Herb
445.		*Sida cordata* (Burm. f.) Borss.	Malvaceae	Herb
446.		*Sida cordifolia* L.	Malvaceae	Herb
447.		*Sida mysorensis* Wight & Arn.	Malvaceae	Herb
448.		*Simarouba amara* Aubl.	Simaroubaceae	Tree
449.	115	*Smilax zeylanica* L.	Smilacaceae	Climber
450.		*Solanum diphyllum* L.	Solanaceae	Shrub
451.	147	*Solanum torvum* Sw.	Solanaceae	Shrub
452.	57	*Solanum violaceum* Ortega.	Solanaceae	Shrub
453.	165	*Solena amplexicaulis* (Lam.) Gandhi.	Cucurbitaceae	Climber
454.		*Spathodea campanulata* P.Beauv.	Bignoniaceae	Tree
455.		*Spatholobus parviflorus* (Roxb. ex DC.) O. Ktze.	Fabaceae	Climber
456.	40	*Spermacoce articularis* L. f.	Rubiaceae	Herb
457.		*Spermacoce hispida* L.	Rubiaceae	Herb
458.	204	*Spermacoce latifolia* Aubl.	Rubiaceae	Herb
459.	149	*Spermacoce ocymoides* Burm.f.	Rubiaceae	Herb
460.		*Sphagneticola calendulacea* (L.) Pruski.	Asteraceae	Herb

Sl. No.	Coll. No.	Botanical name	Family	Habit
461.		*Spondias pinnata* (L. f.) Kurz.	Anacardiaceae	Tree
462.		*Sporobolus indicus* (L.) R. Br.	Poaceae	Herb
463.		*Stephania japonica* (Thunb.) Miers.	Menispermaceae	Climber
464.	125	*Sterculia balanghas* L.	Sterculiaceae	Tree
465.		*Sterculia guttata* Roxb. ex DC.	Sterculiaceae	Tree
466.		*Sterculia urens* Roxb.	Sterculiaceae	Tree
467.	180	*Streblus asper* Lour.	Moraceae	Tree
468.		*Strychnos minor* Dennst.	Loganiaceae	Herb
469.	169	*Strychnos nux-vomica* L.	Loganiaceae	Tree
470.		*Strychnos wallichiana* Steud. ex A.DC.	Loganiaceae	Tree
471.	35	*Swietenia macrophylla* King.	Meliaceae	Herb
472.		*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	Herb
473.		*Syzygium caryophyllatum* (L.) Alston.	Myrtaceae	Tree
474.		*Syzygium cumini* (L.) Skeels.	Myrtaceae	Tree
475.	178	*Syzygium malaccense* (L) Merr. & Perry.	Myrtaceae	Tree
476.	59	*Syzygium zeylanicum* (L.) DC.	Myrtaceae	Shrub
477.	77	*Tabernaemontana alternifolia* L.	Apocynaceae	Shrub
478.	124	*Tabernaemontana divaricata* (L.) R. Br.	Apocynaceae	Shrub
479.	162	*Tadehagi triquetrum* (L.) DC.	Fabaceae	Climber
480.	222	*Talinum portulacifolium* (Forssk.) Aschers & Schweinf.	Portulacaceae	Herb
481.		*Tamarindus indica* L.	Caesalpiniaceae	Tree
482.	37	*Tarlmounia elliptica* (DC.) H. Rob.	Asteraceae	Shrub
483.	137	*Tecoma stans* (L.) Juss. ex Kunth.	Bignoniaceae	Shrub
484.	164	*Tectona grandis* L. f.	Verbenaceae	Tree
485.		*Tephrosia purpurea* (L.) Pers.	Fabaceae	Herb
486.	94	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Tree
487.	98	*Terminalia catappa* L.	Combretaceae	Tree
488.		*Terminalia elliptica* Willd.	Combretaceae	Tree
489.	171	*Terminalia paniculata* Roth	Combretaceae	Tree
490.		*Trametes nudiflora* R. Br.	Datiscaceae	Tree
491.	127	*Tetrapilus dioicus* (Roxb.) L.A.S. Johnson.	Oleaceae	Tree
492.	159	*Tetrastigma leucostaphylum* (Dennst.) Alston ex Mabb.	Vitaceae	Shrub
493.		*Thespesia populnea* (L.) Soland. ex	Malvaceae	Herb

Sl. No.	Coll. No.	Botanical name	Family	Habit
		Correa.		
494.		*Thunbergia erecta* (Benth.) T. Anderson.	Acanthaceae	Shrub
495.	96	*Tiliacora acuminata* (Poir.) Miers ex Hook.f. & Thomas.	Menispermaceae	Climber
496.		*Tinospora cordifolia* (Willd.) Miers.	Menispermaceae	Climber
497.		*Tinospora sinensis* (Lour.) Merr.	Menispermaceae	Climber
498.	51	*Torenia bicolor* Dalz.	Scrophulariaceae	Herb
499.	173	*Torenia crustacea* (L.) Cham. & Schltdl.	Scrophulariaceae	Herb
500.		*Toxocarpus kleinii* Wight & Arn.	Asclepiadaceae	Herb
501.	76	*Tragia involucrata* L.	Euphorbiaceae	Herb
502.		*Tragia montana* (Thwaites.) Muell.-Arg.	Euphorbiaceae	Climber
503.		*Trapa natans L.*	Trapaceae	Herb
504.	108	*Trema orientale*(L.) Blume.	Ulmaceae	Tree
505.	183	*Trichosanthes cucumerina* L.	Cucurbitaceae	Climber
506.	218	*Tridax procumbens* L.	Asteraceae	Herb
507.	190	*Triumfetta rhomboidea* Jacq.	Tiliaceae	Herb
508.		*Uraria rufescens* (DC.) Schind.	Fabaceae	Herb
509.	26	*Urena lobata* L.	Malvaceae	Tree
510.		*Urochloa distachyos* (L.) T.Q. Nguyen.	Poaceae	Shrub
511.		*Utricularia aurea* Lour.	Lentibulariaceae	Shrub
512.	47	*Uvaria narum* (Dunal) Wall. ex Hook.f. & Thoms.	Annonaceae	Shrub
513.		*Vanda tessellata* (Roxb.) Hook. ex D. Don.	Orchidaceae	Shrub
514.	58	*Vateria indica* L.	Dipterocarpaceae	Tree
515.	131	*Vigna radiata* (L.) Wilczek.	Fabaceae	Herb
516.		*Vincetoxicum indicum* (Burm.f.) Mabb.	Asclepiadaceae	Climber
517.		*Vitex altissima* L. f.	Verbenaceae	Tree
518.	18	*Vitex negundo* L.	Verbenaceae	Shrub
519.		*Wattakaka volubilis* (L. f.) Stapf.	Asclepiadaceae	Shrub
520.		*Wrightia tinctoria* (Roxb.) R. Br.	Apocynaceae	Tree
521.		*Xenostegia tridentata* (L.) Austin & Staples.	Convolvulaceae	Climber
522.		*Xylia xylocarpa* (Roxb.) Taub.	Mimosaceae	Tree
523.		*Zanonia indica* L.	Cucurbitaceae	Climber

Sl. No.	Coll. No.	Botanical name	Family	Habit
524.		*Zanthoxylum rhetsa* (Roxb.) DC.	Rutaceae	Tree
525.	148	*Zingiber officinale* Roscoe.	Zingiberaceae	Herb
526.	199	*Zingiber zerumbet* (L.) Sm.	Zingiberaceae	Herb
527.	80	*Ziziphus oenoplia* (L.) Mill.	Rhamnaceae	Shrub
528.		*Ziziphus rugosa Lam.*	Rhamnaceae	Shrub
529.		*Zornia diphylla* (L.) Pers.	Fabaceae	Herb

Significant tree species seen in 70 sacred groves were *Antiaris toxicaria* Lesch., *Artocarpus hirsutus* Lam., *Ficus religiosa* L., *Ficus benghalensis* L., *Hopea ponga* (Dennst.) Mabb., *Alstonia scholaris* (L.) R. Br., *Dalbergia latifolia* Roxb., *Mimusops elengi* L., *Holigarna arnottiana* Hook.f., *Strychnos nux-vomica* L., *Hydnocarpus pentandra* (Buch.-Ham.) Oken,*Swietenia macrophylla* King., etc.

Barleria prionitis L., *Jatropha gossypiifolia* L., *Helicteres isora* L., *Leea indica* (Burm.f.) Merr., *Chassalia curviflora* (Wall. ex Kurz) Thwaites, *Clerodendrum infortunatum* L., *Canthium angustifolium* Roxb., *Glycosmis pentaphylla* (Retz.) DC., etc. are the common shrubs found in sacred groves of Palakkad district.

Sida cordata (Burm. f.) Borss., *Blepharis maderaspatensis (L.) Heyne ex Roth., Sebastiana chamaelea* (L.) Muell.Arg. in DC. *Aerva lanata* (L.) A.L. Juss. ex Schult., *Vernonia cinerea* (L.) Less, *Cleome burmannii* Wight & Arn., *Ruellia prostrata* Poir, *Alternanthera brasiliana* (L.) Kuntze, *Costus speciosus* (Koenig) Sm., *Achyranthes aspera* L., *Curcuma aeruginosa* Roxb., etc. were the common herbs in the sacred groves of Palakkad district.

Connarus monocarpus L., *Dioscorea oppositifolia L., Calycopteris floribunda* Lam., *Spatholobus parviflorus* (Roxb. ex DC.) O. Ktze., *Abrus precatorius* L., *Cansjera rheedei* Gmel., *Sarcostigma kleinii* Wight & Arn., *Combretum latifolium* Blume, *Cissampelos pareira L., etc.* were the important climbers in sacred groves.

A root parasite *Aeginetia indica* L.was reported from Parakkattukavu, Madathody, Athippatta Mana and Hariharakunnu Temple. *Helicanthes elastica* (Desr.) Danser and *Dendrophthoe falcata* (L.f.) Ettingsh. are the common stem parasites present in almost all groves especially in tree abundant areas.

Corypha umbraculifera L., *Borassus flabellifer* L., *Cocos nucifera* L., *Caryota urens* L. and *Areca catechu* L. are the palm species present in sacred groves of Palakkad district.

Saraca asoca (Roxb.) de Wilde, *Strychnos nux-vomica* L.,*Ficus religiosa* L., *Alstonia scholaris* (L.) R. Br., *Aegle marmelos* (L.) Correa, *Ixora coccinea* L., are found planted inside the groves and generally considered as sacred plants. (Plate 2)

Most abundant trees seen in the sacred groves are coming under Moraceae, Sapotaceae, Apocynaceae, Araceae, Fabaceae, etc. The place of dieties are present under this trees. According to the belief of the people the sacred groves are the ideal places for the diety worship in other words likes shades of larger trees and are considered as sacred. *Ficus benghalensis* L., *Ficus religiosa* L., *Ficus microcarpa* L. f., *Ficus tsjahela* Burm.f., *Ficus amplissima* J. E. Smith, *Artocarpus heterophyllus* Lam.,*Ficus krishnae* C.DC., *Holarrhena pubescens* (Buch.-Ham.) Wall. ex G. Don, *Alstonia scholaris* (L.) R. Br., *Mimusops elengi* L., *Ficus microcarpa* L. f. etc. are significant plants having latex producing capacity seen in sacred groves of Palakkad district.

Almost all sacred groves reported native plant species and they helps to keep up with the natural vegetation inside the groves. *Bombax ceiba* L., *Grewia tiliifolia* Vahl, *Briedelia retusa* (L.) A. Juss., *Aglaia elaeagnoidea* (A. Juss.) Benth.,.etc. are common examples.(Plate 3).

The vast majority of the plants inside the sacred groves are important medicinally and used in different systems like Ayurveda, Folk , Siddha..etc. These plants or products of plants utilized in the treatment of different illness like fever, cough, cold, skin diseases, cancer,cardio – vascular diseases, gastro – intestinal problems..etc. 303 out of 529 (57.27%) species are found medicinally significant. (Plate 4 & 5). Plants like *Annona reticulata* L., *Alstonia scholaris* (L.) R. Br., *Bambusa bambos* (L.) Voss, *Borassus flabellifer* L., *Boerhavia diffusa* L., *Bryophyllum pinnatum* (Lam.) Kurz, *Cinnamomum verum* J. Presl, *Carica papaya* L., *Cassia fistula* L., *Cleome viscosa* L., *etc.* are mainly used in the treatment of cardio

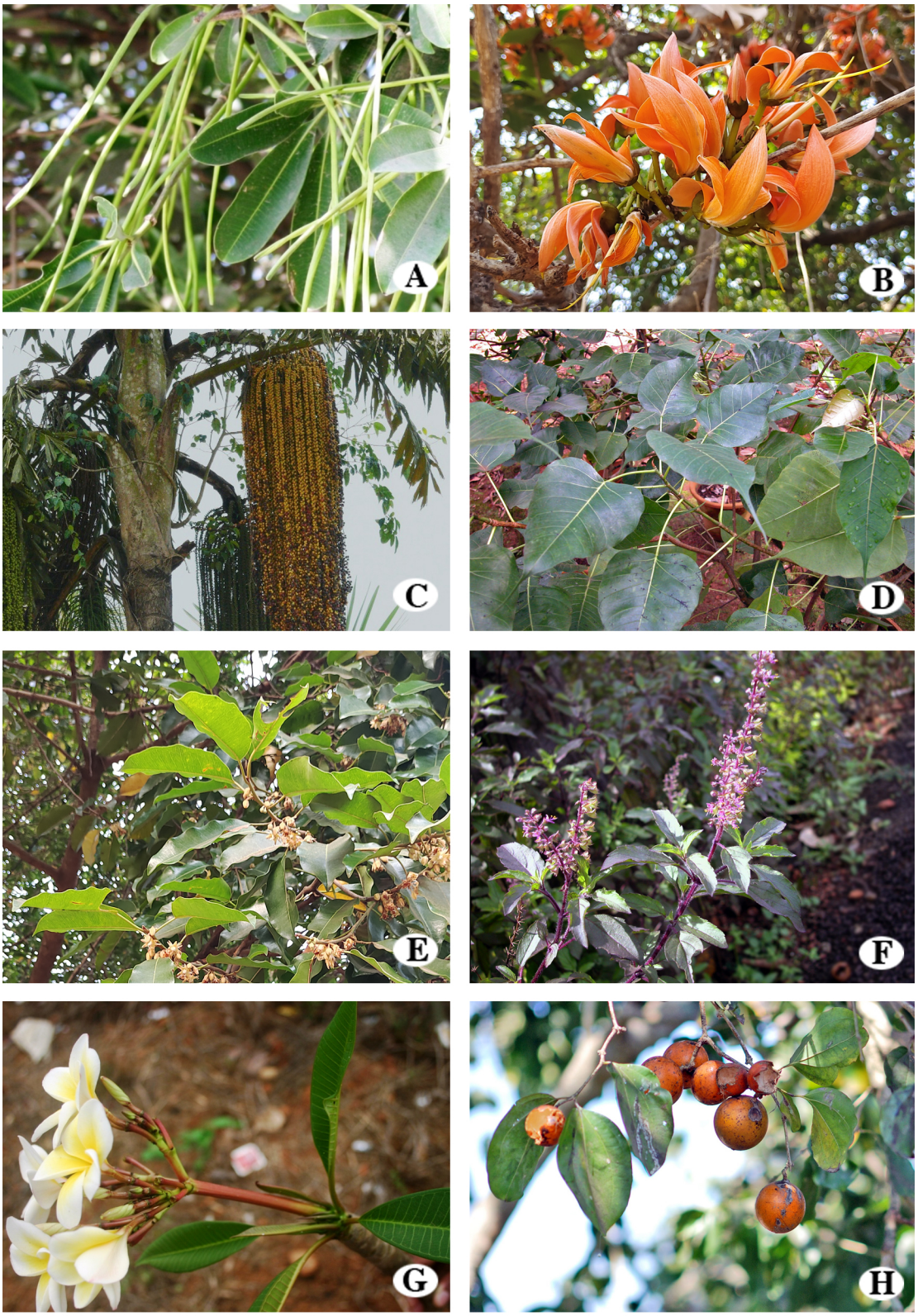


Plate 2. Sacred plant species

A. *Alstonia scholaris* (L.) R. Br.*;* **B**. *Butea monosperma* (Lam.) Taub. *;*
C. *Caryota urens* L.*;* **D**. *Ficus religiosa* L.*;* **E**. *Mimusops elengi* L.*;*
F. *Ocimum tenuiflorum* L.*;* **G**. *Plumeria rubra* L.*;*
H. *Strychnos nux vomica* L.

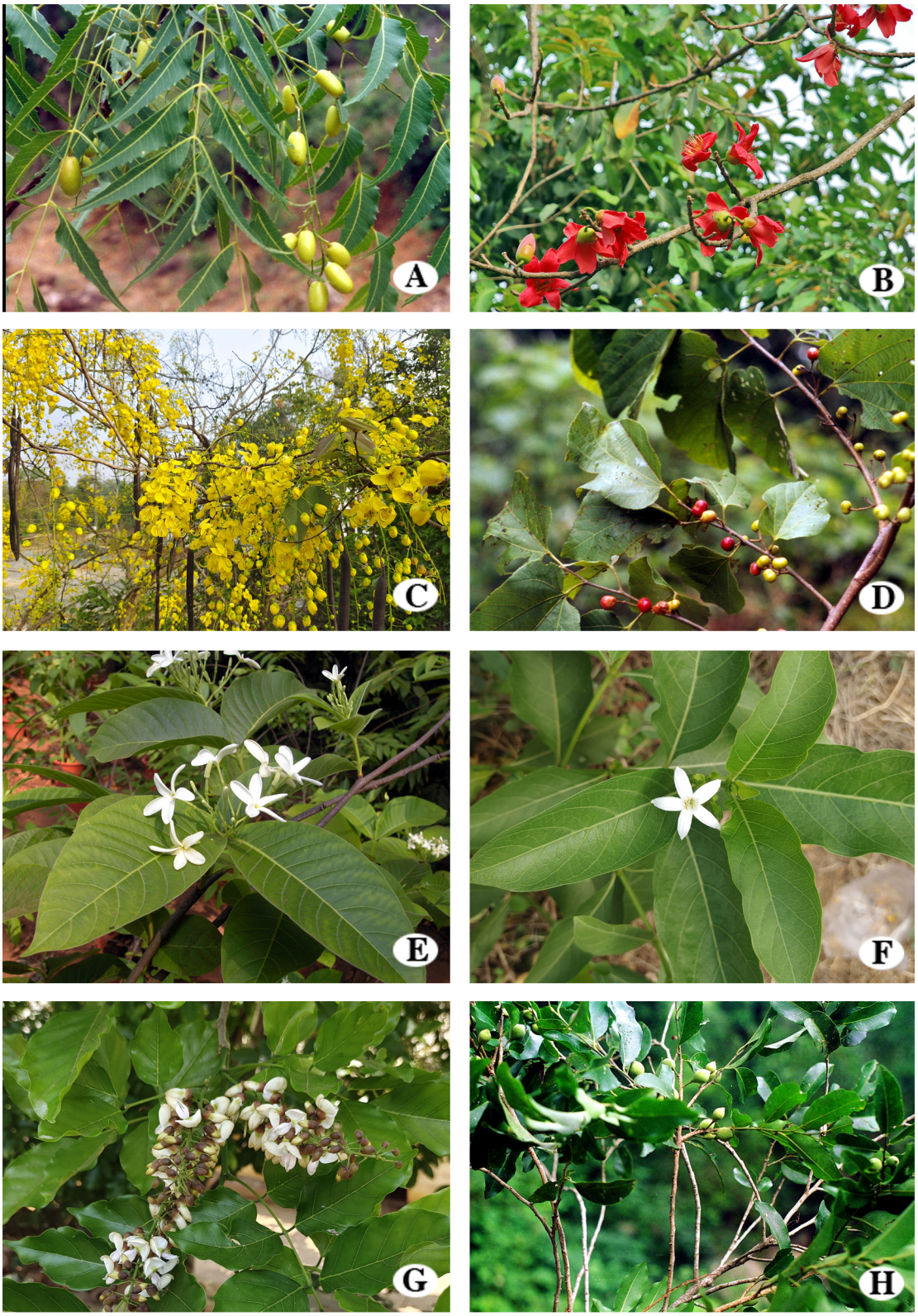


Plate 3. Native tree species

A. *Azadirachta indica* A. Juss.*;* **B**. *Bombax ceiba* L.*;*
C. *Cassia fistula* L.*;* **D**. *Grewia tiliifolia* Vahl.*;*
E. *Holarrhena pubescens* (Buch.-Ham.) Wall. ex G. Don.*;*
F. *Morinda pubescens* J. E. Smith.*;* **G**. *Pongamia pinnata* (L.) Pierre.*;*
H. *Putranjiva roxburghii* Wall.

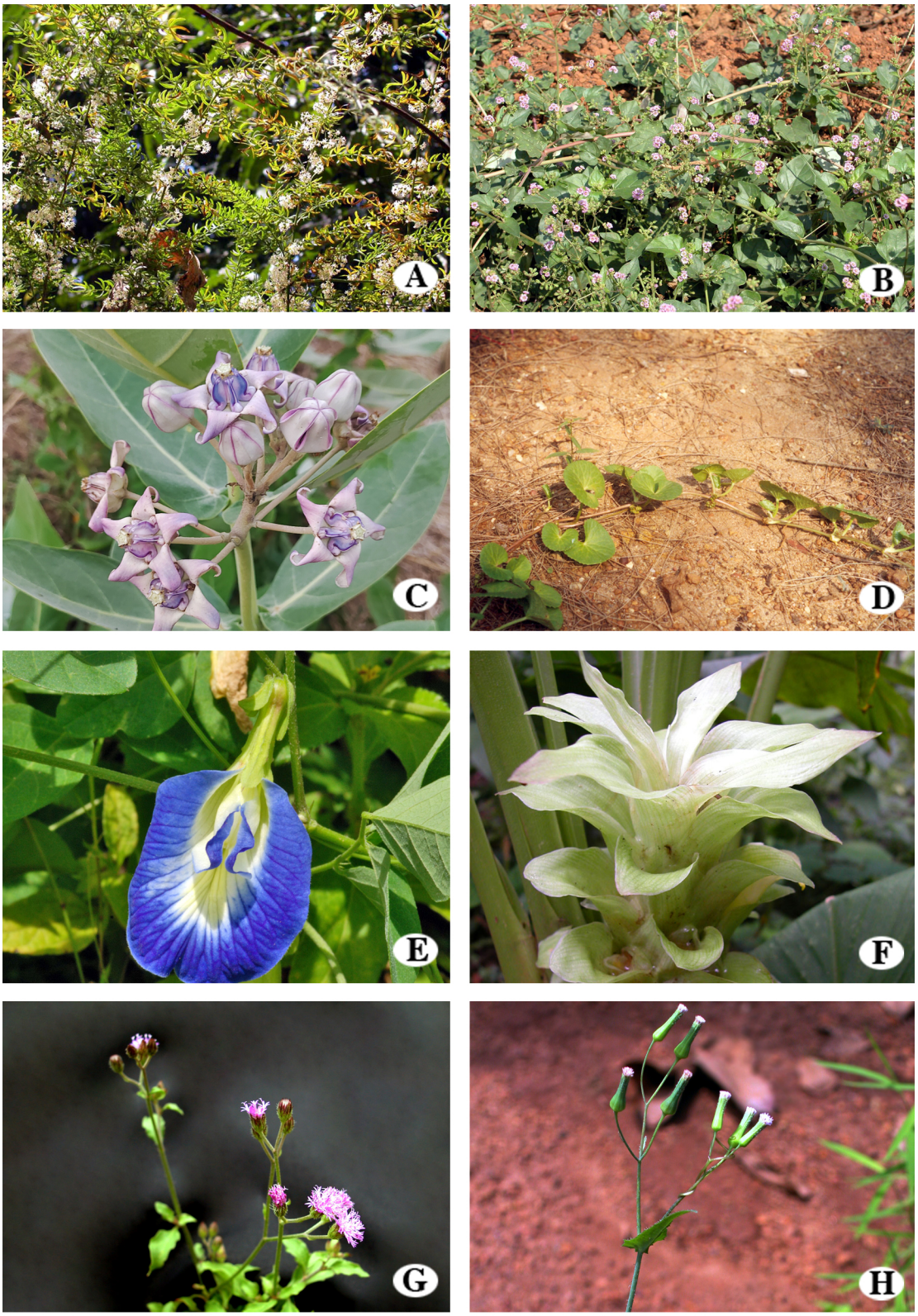


Plate 4. Medicinal plant species

A. *Asparagus racemosus* Willd.*;* **B**. *Boerhavia diffusa* L.*;*
C. *Calotropis gigantea* (L.) Dryand.*;* **D**. *Centella asiatica* (L.) Urb.*;*
E. *Clitoria ternatea* L.*;* **F**. *Curcuma longa* L.*;*
G. *Cyanthillium cinerum* (DC) H.Rob.*;* **H**. *Emilia sonchifolia* (L.) DC.



Plate 5. Medicinal plant species

A. *Hemidesmus indicus* (L) R.Br.*;* **B**. *Justicia adhatoda* L.*;*
C. *Phyllanthus emblica* L.*;* **D**. *Plumbago zeylanica* L.*;*
E. *Solanum violaceum* Ortega.*;* **F**. *Tinospora cordifolia* (Willd.) Miers.*;*
G. *Trichosanthes cucumerina* L.*;* **H**. *Vitex negundo* L.

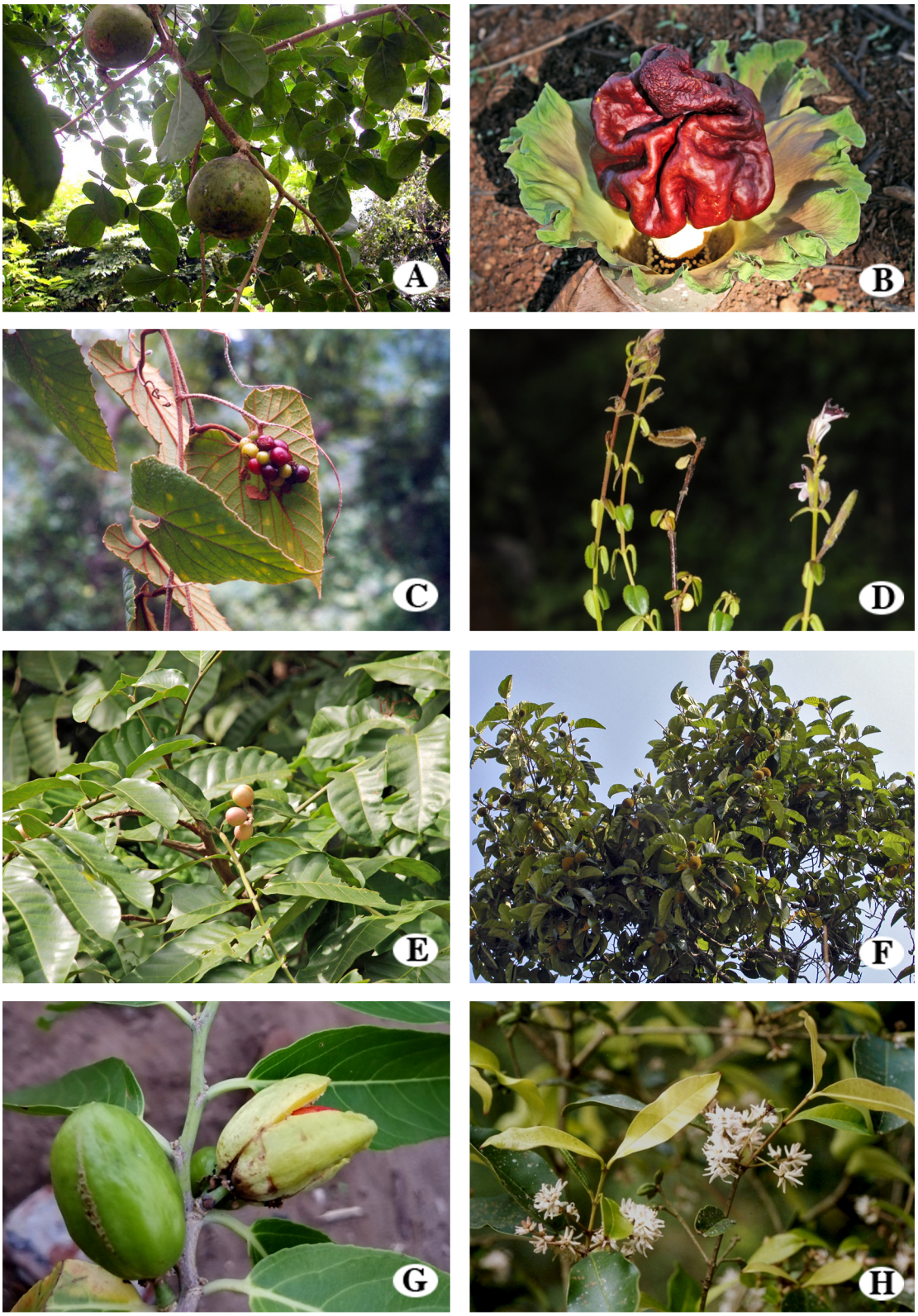


Plate 6. IUCN red listed plant species

A. *Aegle marmelos* (L.) Correa.*;* **B**. *Amorphophallus paeoniifolius* (Dennst.) Nicolson.;
C. *Ampelocissus indica* (L.) Planch.*;* **D**. *Andrographis lawsonii* Gamble.;
E. *Aphanamixis polystachya* (Wall.) R. Parker.*;* **F**. *Artocarpus hirsutus* Lam.;
G. *Casearia wynadensis* Bedd.*;* **H**. *Chionanthus mala-elengi* (Dennst.) P. S. Green.

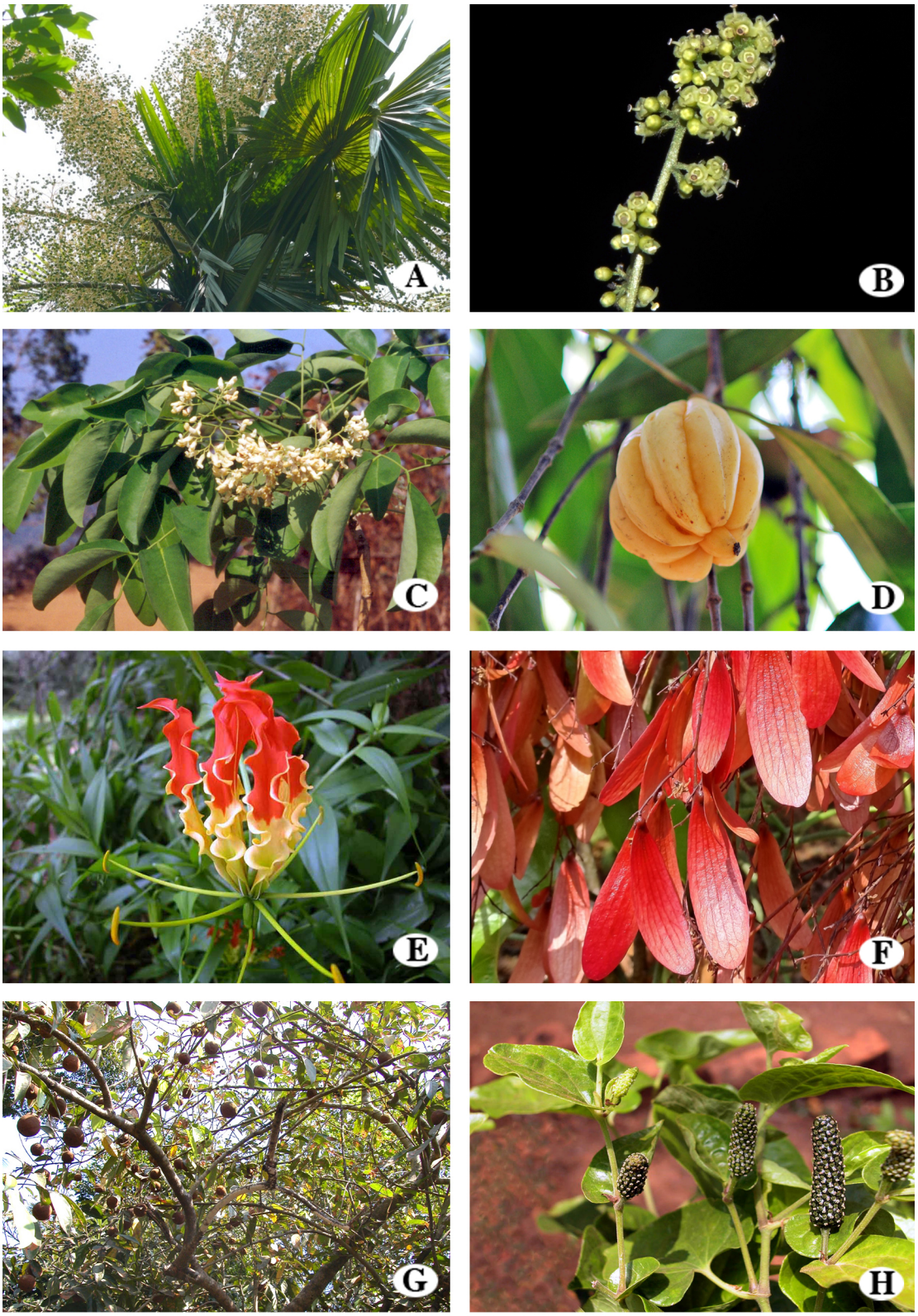


Plate 7. IUCN red listed plant species

A. *Corypha umbraculifera* L.; **B**. *Cyclea fissicalyx* Dunn in Gamble.;
C. *Dalbergia latifolia* Roxb.; **D**. *Garcinia gummi-gutta* (L.) Roxb.;
E. *Gloriosa superba* L.; **F**. *Hopea ponga* (Dennst.) Mabb.;
G. *Hydnocarpus pentandrus* (Buch.-Ham.) Oken.; **H**. *Piper longum* L.

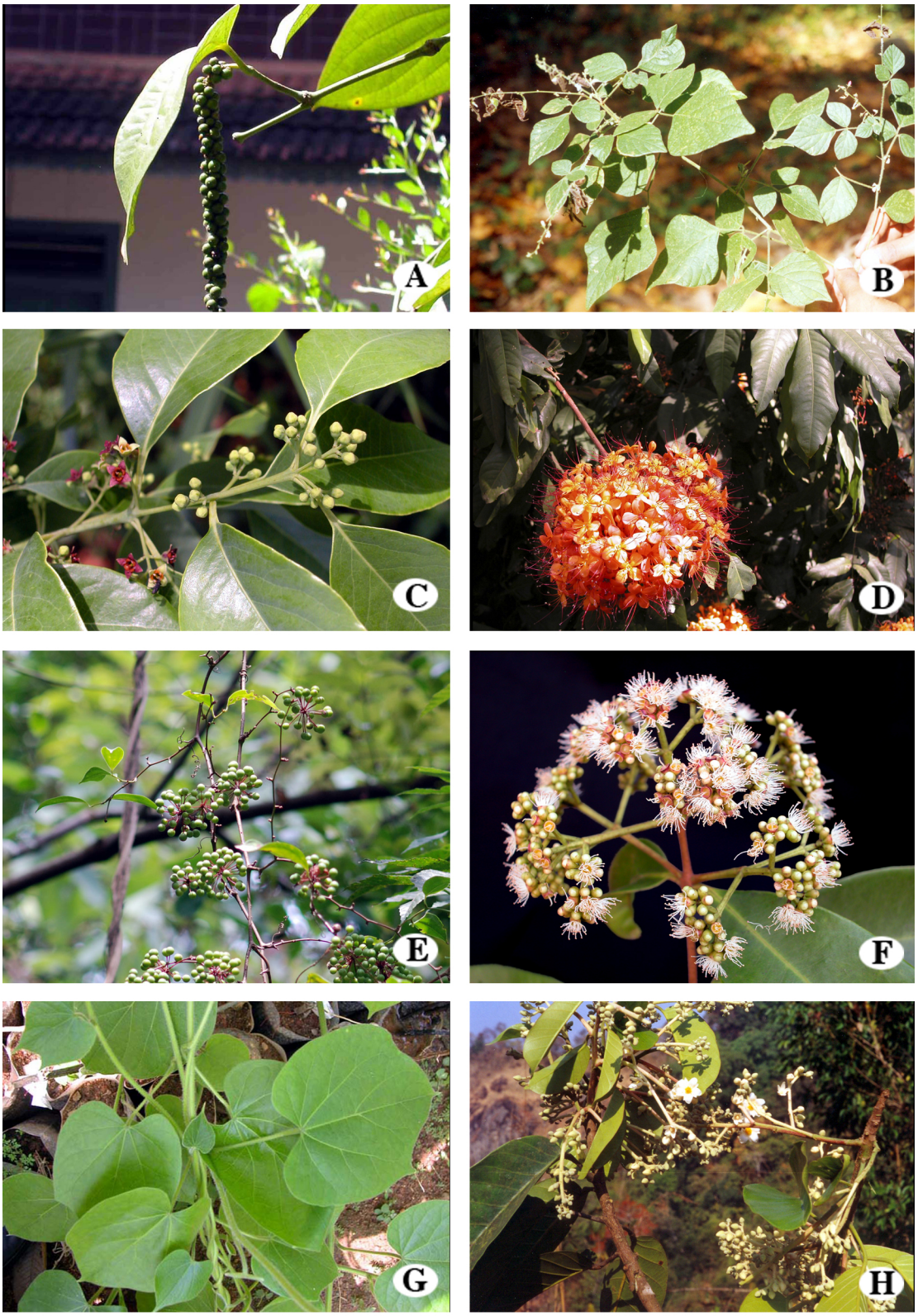


Plate 8. IUCN red listed plant species

A. *Piper nigrum* L.*;* **B**. *Pseudarthria viscida* (L.) Wight & Arn.*;*
C. *Santalum album* L.*;* **D**. *Saraca asoca* (Roxb.) de Wilde.*;*
E. *Smilax zeylanica* L.*;* **F**. *Syzygium caryophyllatum* (L.) Alston.*;*
G. *Tinospora sinensis* (Lour.) Merr.*;* **H**. *Vateria indica* L.

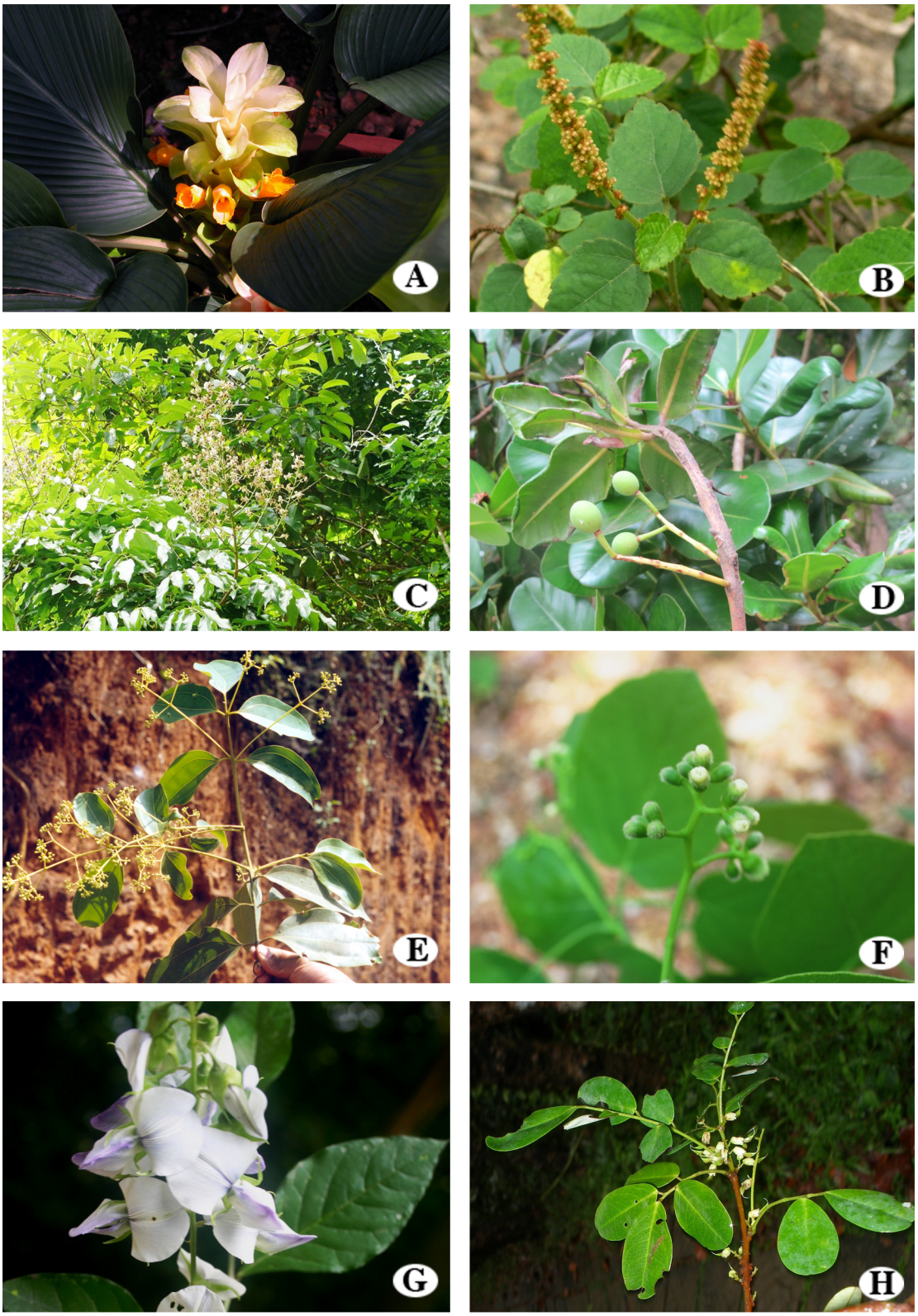


Plate 9. Endemic plant species

A. *Curcuma aurantiaca* Zijp.*;* **B**. *Acalypha capitata* Willd.*;*
C. *Aganope thyrsiflora* (Benth.) Polhil.*;* **D**. *Calophyllum apetalum* Wild.*;*
E. *Cinnamomum malabatrum* (Burm. f.) Blume.*;* **F**. *Cordia wallichi* G. Don, Gen.*;*
G. *Crotalaria heyneana* Graham ex Wight & Arn.*;* **H**. *Dalbergia horrida* (Dennst.) Mabb.

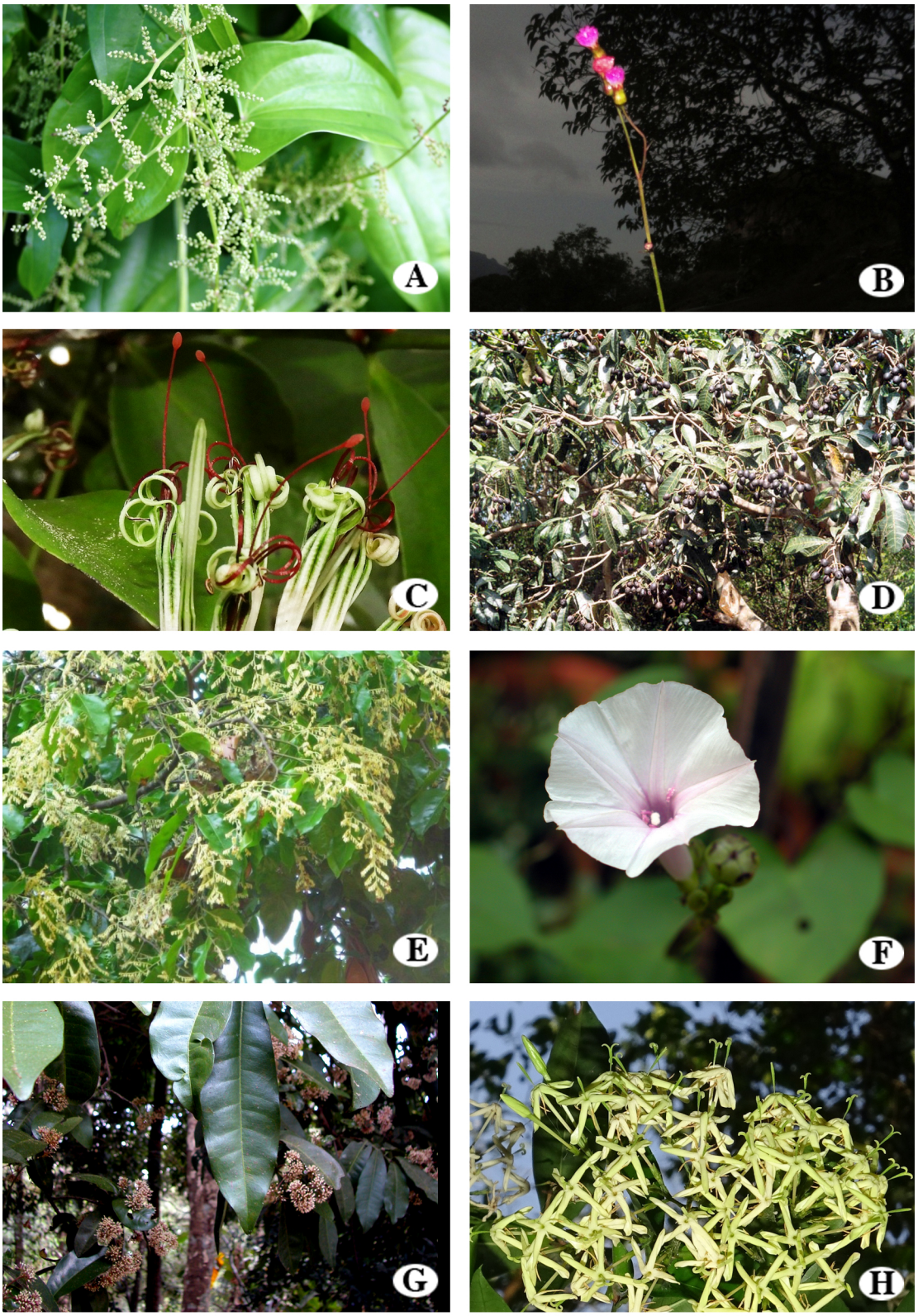


Plate 10. Endemic plant species

A. *Dioscorea alata* L.*;* **B**. *Emilia scabra* DC.*;* **C**. *Helicanthes elastica (Desr.) Danser.;* **D**. *Holigarna arnottiana* Hook.f.*;* **E**. *Hopea parviflora* Bedd.*;* **F**. *Ipomoea marginata* (Desr.) Verdc. f. candida (Naik & Zate) Das & Lakshmin.*;* **G**. *Ixora brachiata* Roxb. ex DC.*;* **H**. *Ixora malabarica* (Dennst.) Mabb.

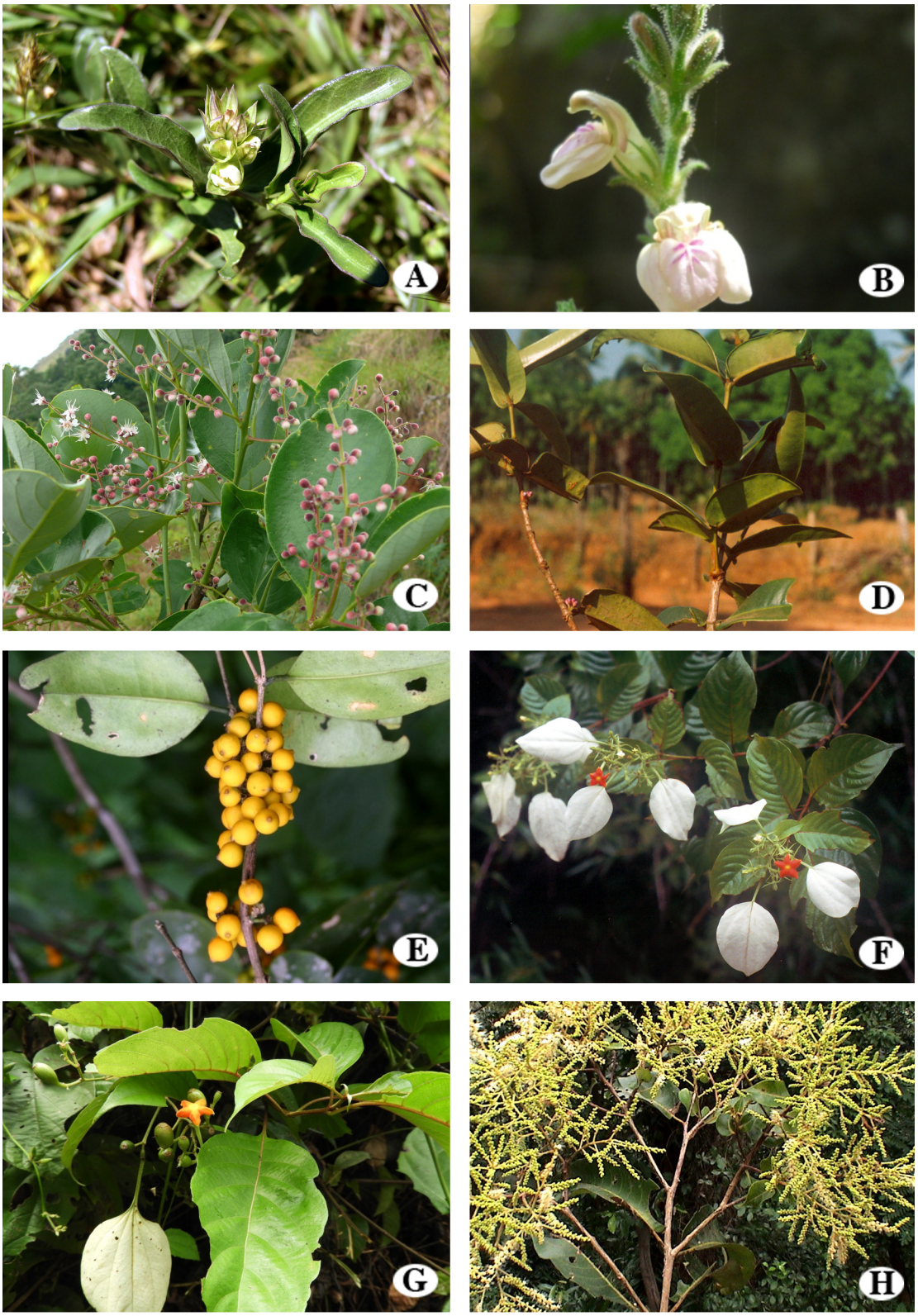


Plate 11. Endemic plant species

A. *Justicia trinervia* Vahl.*;* **B**. *Justicia wynaadensis* (Nees) Heyne ex T. Anderson.*;* **C**. *Lagerstroemia microcarpa* Wight, Icon.*;* **D**. *Memecylon randerianum* S.M. Almeida & M.R. Almeida.*;* **E**. *Memecylon talbotianum* Brandis.*;* **F**. *Mussaenda frondosa* L.*;* **G**. *Mussaenda glabrata* (Hook.f.)Hutch. Ex Gamble.*;* **H**. *Terminalia paniculata* Roth.

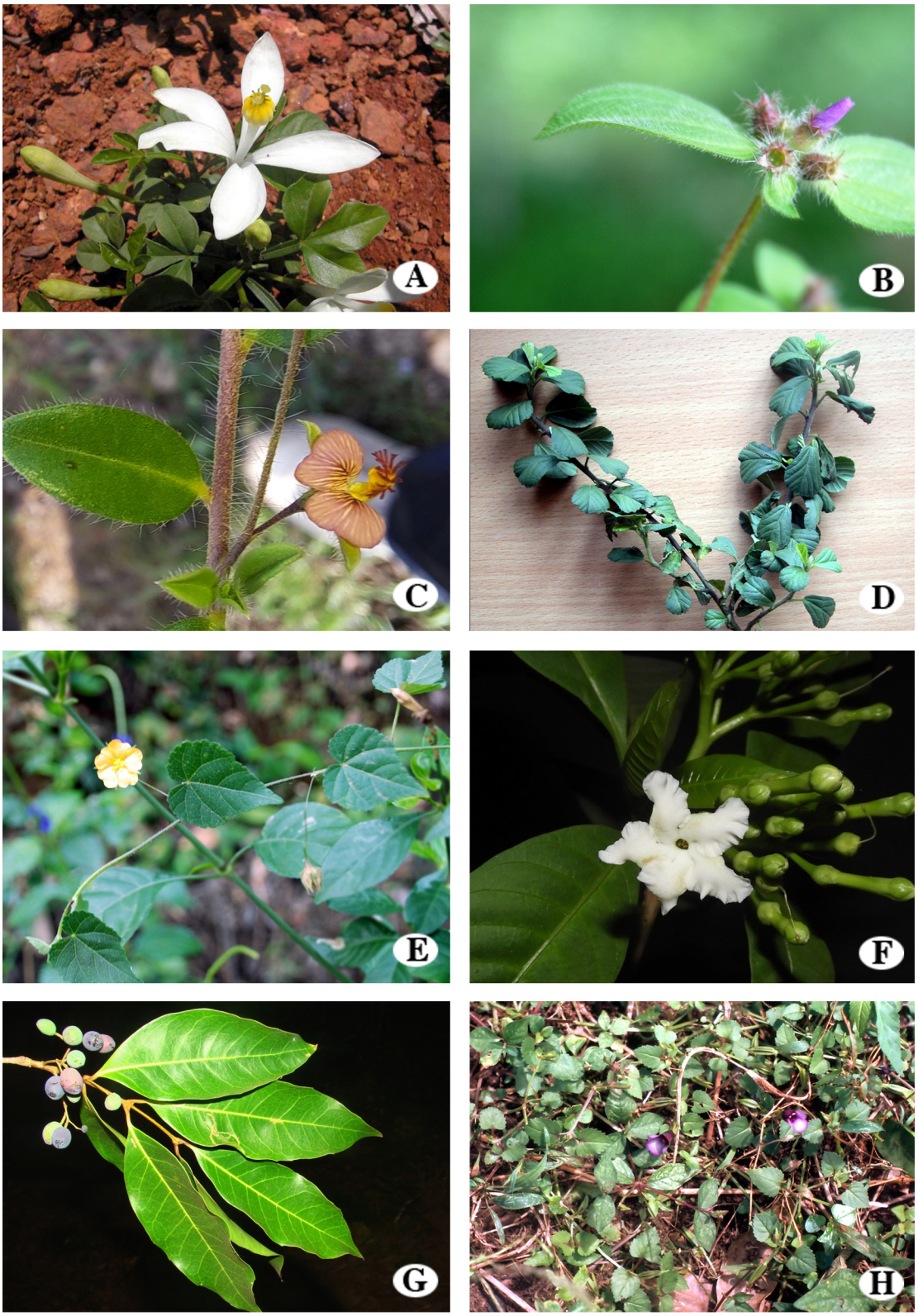


Plate 12. Endemic plant species

A. *Naregamia alata* Wight & Arn.*;* **B**. *Osbeckia muralis* Naud.*;*
C. *Polygala bolbothrix* Dunn in Gamble.*;* **D**. *Sida alnifolia* (L.) Ugbor.*;*
E. *Sida beddomei* Jacob, J.*;* **F**. *Tabernaemontana alternifolia* L.*;*
G. *Tetrapilus dioicus* (Roxb.) L.A.S. Johnson.*;* **H**. *Torenia bicolor* Dalz.

– vascular problems. *Bombax ceiba* L., *Scoparia dulcis* L., *Phyllanthus amarus* Schum. & Thonn.,etc. are used in the treatment of kidney diseases.

Greatest diversity was present in Athippatta Mana (93 plant species, 89 genera and 52 families) followed by Parakkattukavu Bhagavathi Kshethram (77 plant species). Least diversity was present in Punnakkodu nagakshethram, Koduvayur (11 plant species).

Fabaceae (39), Euphorbiaceae (35), Rubiaceae (28), Acanthaceae (20), Asteraceae (20), Poaceae (20), Caesalpiniaceae (15), Moraceae (14) Malvaceae (14), Convolvulaceae (13), Verbenaceae (12) and Apocynaceae (11) are the most abundant plant families announced from the sacred groves.

The families such as Alangiaceae, Apiaceae, Bixaceae, Bromeliaceae, Burseraceae, Cactaceae, Caricaceae, Caryophyllaceae, Casuarinaceae, Chenopodiaceae, Datiscaceae, Dracaenaceae, Erythroxylaceae, Gentianaceae, Goodeniaceae, Haloragaceae, Hydrophyllaceae, Hypoxidaceae, Icacinaceae, Lecythidaceae, Leeaceae,Lentibulariaceae, Lobeliaceae, Magnoliaceae, Malpighiaceae, Menyanthaceae, Molluginaceae, Myrsinaceae, Nelumbonaceae, Nyctanthaceae, Nymphaceae, Onagraceae, Opiliaceae, Orobanchaceae, Oxalidaceae, Pandanaceae, Papavaraceae, Pedaliaceae, Polygalaceae, Pontederiaceae, Ranunculaceae, Rhizophoraceae, Santalaceae, Smilacaceae, Thymelaeaceae, Trapaceae, Violaceae are having single member representation only. The Gymnosperm families Gnetaceae and Cycadaceae having one member each.

Ampelocissus indica (L.) Planch.,*Andrographis lawsonii* Gamble.,*Chionanthus mala-elengi* (Dennst.) P. S. Green ,*Cyclea fissicalyx* Dunn.,*Santalum album* L. and *Saraca asoca (Roxb.) de Wilde* are the six endangered species documented from 70 sacred groves of Palakkad district. Aphanamixis polystachya (Wall.) R. Parker. *Artocarpus hirsutus* Lam.,*Casearia wynadensis* Bedd.,*Dalbergia latifolia* Roxb., *Gloriosa superba* L.,*Hopea ponga* (Dennst.) Mabb.,*Hydnocarpus pentandra* (Buch.-Ham.) Oken,*Ixora malabarica* (Dennst.) Mabb.,*Pseudarthria viscida* (L.) Wight & Arn.,*Smilax zeylanica* L. and *Vateria indica* L. are the eleven species noted as

vulnerable. Documented Near threatened species are *Amorphophallus paeoniifolius* (Dennst.) Nicolson., *Garcinia gummi-gutta* (L.) Roxb.,*Magnolia champaca* (L.) Baill. ex Pierre.,*Piper longum* L.,*Syzygium caryophyllatum* (L.) Alston.,*Tabernaemontana alternifolia* L.,*Terminalia cuneata* Roth. and *Tinospora sinensis* (Lour.) Merr. Two data deficient species *Aegle marmelos* (L.) Correa and *Corypha umbraculifera L.* along with one least concern species *Piper nigrum* L. are also documented from these groves. (Plate 6, 7 & 8).

529 plant species recognized from 70 sacred groves of Palakkad district. As per the data provided from red listed medicinal plants from South India (Ravikumar *et al.,* 2000) and the International Union for Conservation of Nature and Natural recources Redlist of Plants (IUCN, July 2022), 28 plants from the observation coming under redlisted. Some of them are regionally redlisted some others are globally.

Table.3. Red listed plants species reported from the sacred groves of Palakkad district

Sl. No.	Botanical Name	Family	Habit	Distribution	IUCN status
1	*Aegle marmelos* (L.) Correa.	Rutaceae	Tree	N/ED	DD
2	*Amorphophallus paeoniifolius* (Dennst.) Nicolson.	Araceae	Herb	N/ED	NT
3	*Ampelocissus indica* (L.) Planch.	Vitaceae	Climber	N/ED	EN
4	*Andrographis lawsonii* Gamble.	Acanthaceae	Herb	ED	EN
5	*Aphanamixis polystachya* (Wall.) R. Parker.	Meliaceae	Tree	N/ED	VU
6	*Artocarpus hirsutus* Lam.	Moraceae	Tree	ED	VU
7	*Casearia wynadensis* Bedd.	Flacourtiaceae	Herb	ED	VU
8	*Chionanthus mala-elengi* (Dennst.) P. S. Green.	Oleaceae	Tree	ED	EN

Sl. No.	Botanical Name	Family	Habit	Distribution	IUCN status
9	*Corypha umbraculifera* L.	Arecaceae	Tree	ED	DD
10	*Cyclea fissicalyx* Dunn.	Menispermaceae	Herb	ED	EN
11	*Dalbergia latifolia* Roxb.	Fabaceae	Tree	N/ED	VU
12	*Garcinia gummi-gutta* (L.) Roxb.	Clusiaceae	Tree	N/ED	NT
13	*Gloriosa superba* L.	Liliaceae	Climber	N/ED	VU
14	*Hopea ponga* (Dennst.) Mabb.	Dipterocarpaceae	Tree	ED	VU
15	*Hydnocarpus pentandra* (Buch.-Ham.) Oken.	Flacourtiaceae	Tree	ED	VU
16	*Ixora malabarica* (Dennst.) Mabb.	Rubiaceae	Shrub	ED	VU
17	*Magnolia champaca* (L.) Baill. ex Pierre.	Magnoliaceae	Tree	N/ED	NT
18	*Piper longum* L.	Piperaceae	Climber	N/ED	NT
19	*Piper nigrum* L.	Piperaceae	Climber	N/ED	LC
20	*Pseudarthria viscida* (L.) Wight & Arn.	Fabaceae	Shrub	N/ED	VU
21	*Santalum album* L.	Santalaceae	Tree	N/ED	EN
22	*Saraca asoca* (Roxb.) de Wilde.	Caesalpiniaceae	Tree	N/ED	EN
23	*Smilax zeylanica* L.	Smilacaceae	Climber	N/ED	VU
24	*Syzygium caryophyllatum* (L.) Alston.	Myrtaceae	Tree	ED	NT
25	*Tabernaemontana alternifolia* L.	Apocynaceae	Tree	ED	NT
26	*Terminalia cuneata* Roth.	Combretaceae	Tree	N/ED	NT
27	*Tinospora sinensis* (Lour.) Merr.	Menispermaceae	Climber	N/ED	NT
28	*Vateria indica* L.	Dipterocarpaceae	Tree	ED	VU

C: Climber, H: Herb, S: Shrub, T: Tree, CR-Critically endangered; DD: Data deficient; ED: Endemic; EN: Endangered; LC: Least concern; N/ED: Non endemic, NT: Near threatened; VU: Vulnerable

Endemic tree species like *Hopea ponga* (Dennst.) Mabb. was present Pacheerikkavu, Athippattamana Nagakanyakshethram and Parakkattukavu Bhagavathi Kshethram. *Vateria indica* L., Critically endangered and Vulnerable plant was present in Athippattamana Nagakanyakshethram (Thachanattukara, Mannarkkad) and Ethanur Pandalangatt sarpakkavu (Koduvayur, Chittur)

Dipterocarpaceae, Malvaceae, Moraceae, Euphorbiaceae, Loranthaceae, Cluciaceae, Rubiaceae, Anacardiaceae, Flacourtiaceae, etc. are the significant endemic plant families recorded from 70 sared groves of Palakkad district. Out of 529 species identified from sacred groves, 38 species are endemics to South India. (Table - 4 and Plate 9, 10, 11&12).

Table.4. List of Endemic species reported from the sacred groves of Palakkad district

Sl. No.	Botanical name	Habit	Family
1	*Acalypha capitata* Willd.	Shrub	Euphorbiaceae
2	*Aganope thyrsiflora* (Benth.) Polhil.	Climber	Fabaceae
3	*Andrographis lawsonii* Gamble.	Herb	Acanthaceae
4	*Calophyllum apetalum* Wild.	Tree	Clusiaceae
5	*Casearia wynadensis* Bedd.	Tree	Flacourtiaceae
6	*Chionanthus mala-elengi* (Dennst.) P. S. Green.	Tree	Oleaceae
7	*Cinnamomum malabatrum* (Burm. f.) Blume.	Tree	Lauraceae
8	*Cordia wallichi* G. Don.	Tree	Boraginaceae
9	*Crotalaria heyneana* Graham ex Wight & Arn.	Shrub	Fabaceae
10	*Cyclea fissicalyx* Dunn.	Climber	Menispermaceae
11	*Dalbergia horrida* (Dennst.) Mabb.	Climber	Fabaceae
12	*Dioscorea alata* L.	Climber	Dioscoreaceae
13	*Emilia scabra* DC.	Herb	Asteraceae
14	*Helicanthes elastica* (Desr.) Danser.	Shrub	Loranthaceae
15	*Holigarna arnottiana* Hook.f.	Tree	Anacardiaceae
16	*Hopea parviflora* Bedd.	Tree	Dipterocarpaceae
17	*Hopea ponga* (Dennst.) Mabb.	Tree	Dipterocarpaceae
18	*Ipomoea marginata* (Desr.) Verdc.	Climber	Convolvulaceae
19	*Ixora brachiata* Roxb. ex DC.	Tree	Rubiaceae
20	*Ixora malabarica* (Dennst.) Mabb.	Shrub	Rubiaceae

Sl. No.	Botanical name	Habit	Family
21	*Justicia trinervia* Vahl.	Herb	Acanthaceae
22	*Justicia wynaadensis* (Nees) Heyne ex T. Anderson.	Shrub	Acanthaceae
23	*Lagerstroemia microcarpa* Wight .	Tree	Lythraceae
24	*Memecylon depressum* Benth. ex Triana.	Shrub	Melastomataceae
25	*Memecylon randerianum* S.M. Almeida & M.R. Almeida.	Shrub	Melastomataceae
26	*Memecylon talbotianum* Brandis.	Tree	Melastomataceae
27	*Mussaenda frondosa* L.	Shrub	Rubiaceae
28	*Mussaenda glabrata*(Hook.f.)Hutch. ex Gamble.	Shrub	Rubiaceae
29	*Myriophyllum oliganthum* (Wight & Arn.) F. v. Muell.	Herb	Haloragaceae
30	*Naregamia alata* Wight & Arn.	Herb	Meliaceae
31	*Osbeckia muralis* Naud.	Herb	Melastomataceae
32	*Pandanus kaida* Kurz.	Shrub	Pandanaceae
33	*Polygala bolbothrix* Dunn.	Herb	Polygalaceae
34	*Sida beddomei* Jacob.	Herb	Malvaceae
35	*Tabernaemontana alternifolia* L.	Shrub	Apocynaceae
36	*Tetrapilus dioicus* (Roxb.) L.A.S. Johnson.	Tree	Oleaceae
37	*Terminalia paniculata* Roth.	Tree	Combretaceae
38	*Torenia bicolor* Dalz.	Herb	Scrophulariaceae
39	*Vateria indica* L.	Tree	Dipterocarpaceae

122 most common invasive and exotic plants were reported from the 70 sacred groves are *Chromolaena odorata* (L.) King & H. Rob., *Mikania micrantha* Kunth and *Lantana camara* L. *etc.* (Plate 13). These plants are in competition with the native plants for water, minerals and sunlight. Their rapid and vigorous out growth may result in distruction of biodiversity. *Bixa orellana* L., *Citharexylum spinosum* L., *Albizia saman* (Jacq.) F.Muell., *Millingtonia hortensis* L. f., *Nyctanthes arbor-tristis* L., *Couroupita guianensis* Aubl., *etc. Gardenia jasminoides* Ellis., *Bambusa vulgaris* Schrad., *Delonix regia* (Boj. ex Hook) Rafin., *Spathodea campanulata* P.Beauv., *Plumeria rubra* L. *etc.* are the common exotic plants planted inside the groves for enhancing their beauty. Another exotic plant *Carica papaya* L. observed inside the groves mainly by seed dispersal mechanisms. All plants inside the groves are the property of diety. So, they are

well protected irrespect of their relevense exotic species (Plate 14 & 15). The exotic plants were present inside the sacred groves are listed in the table 5.

Table. 5. Exotic plant species reported from the sacred groves of Palakkad district

Sl. No.	Botanical name	Habit	Family
1	*Acacia auriculiformis* Benth.	Tree	Mimosaceae
2	*Acacia mangium* Willd.	Tree	Mimosaceae
3	*Acanthospermum hispidum* DC.	Herb	Asteraceae
4	*Acmella calva* (DC.) R.K. Jansen.	Herb	Asteraceae
5	*Adenanthera pavonina* L.	Tree	Mimosaceae
6	*Aeschynomene americana* L.	Herb	Fabaceae
7	*Ageratum conyzoids* L.	Herb	Asteraceae
8	*Allamanda cathartica* L.	Shrub	Apocynaceae
9	*Alternanthera bettzickiana* (Regel) Voss.	Herb	Amaranthaceae
10	*Alternanthera brasiliana* (L.) Kuntze.	Herb	Amaranthaceae
11	*Amaranthus spinosus* L.	Herb	Amaranthaceae
12	*Anacardium occidentale* L.	Tree	Anacardiaceae
13	*Annona muricata* L.	Tree	Annonaceae
14	*Annona reticulata* L.	Tree	Annonaceae
15	*Annona squamosa L.*	Tree	Annonaceae
16	*Aquilaria malaccensis* Lam.	Tree	Thymelaeaceae
17	*Argemone mexicana* L.	Herb	Papavaraceae
18	*Aristolochia ringens* Vahl.	Shrub	Aristolochiaceae
19	*Bambusa vulgaris* Schrad.	Shrub	Poaceae
20	*Barleria cristata* L.	Shrub	Acanthaceae
21	*Bauhinia acuminata* L.	Shrub	Caesalpiniaceae
22	*Bauhinia purpurea* L.	Tree	Caesalpiniaceae
23	*Bauhinia tomentosa* L.	Shrub	Caesalpiniaceae
24	*Bauhinia variegata* L.	Tree	Caesalpiniaceae
25	*Biancaea sappan* (L.) Thod.	Tree	Caesalpiniaceae
26	*Bixa orellana* L.	Tree	Bixaceae
27	*Borassus flabellifer* L.	Tree	Arecaceae
28	*Breynia androgyna* (L.) Chakarb. & N.P. Balakr.	Shrub	Euphorbiaceae
29	*Bryophyllum pinnatum* (Lam.) Kurz.	Herb	Crassulaceae
30	*Caesalpinia pulcherrima* (L.) Swartz.	Shrub	Caesalpiniaceae
31	*Caladium bicolor* (Ait. ex Dryand.) Vent.	Herb	Araceae
32	*Camonea vitifolia* (Burm.f.)A.R. Simoes & Staoles.	Climber	Convolvulaceae

33	*Capsicum frutescens* L.	Shrub	Solanaceae
34	*Carica papaya* L.	Tree	Caricaceae
35	*Cascabela thevetia* (L.) Lippold.	Shrub	Apocynaceae
36	*Casuarina equisetifolia* L.	Tree	Casuarinaceae
37	*Ceiba pentandra* (L.) Gaertn.	Tree	Bombacaceae
38	*Centrosema molle* Benth.	Climber	Fabaceae
39	*Cereus pterogonus* Lam.	Shrub	Cactaceae
40	*Chromolaena odorata* (L.) King & H. Rob.	Shrub	Asteraceae
41	*Chrysophyllum cainito* L.	Tree	Sapotaceae
42	*Chrysophyllum oliviforme* L.	Tree	Sapotaceae
43	*Citharexylum spinosum* L.	Tree	Verbenaceae
44	*Citrus limon (*L.) Burm.f.	Tree	Rutaceae
45	*Citrus medica* L.	Tree	Rutaceae
46	*Clerodendrum paniculatum* L.	Shrub	Verbenaceae
47	*Clinacanthus nutans* (Burm. f.) Lindau.	Shrub	Acanthaceae
48	*Clitoria ternatea* L.	Climber	Fabaceae
49	*Combretum indicum* (L.) De. Philipps.	Climber	Combretaceae
50	*Couroupita guianensis* Aubl.	Tree	Lecythidaceae
51	*Dactyloctenium aegyptium* (L.) P. Beauv.	Herb	Poaceae
52	*Delonix regia* (Boj. ex Hook) Rafin.	Tree	Caesalpiniaceae
53	*Desmodium scorpiurus* (Sw.) Desv.	Herb	Fabaceae
54	*Dysphania ambrosioides* (L.) Mosyakin & Clemants.	Herb	Chenopodiaceae
55	*Eleutheranthera ruderalis* (Sw.) Sch.-Bip.	Herb	Asteraceae
56	*Euphorbia hirta* L.	Herb	Euphorbiaceae
57	*Euphorbia tithymaloides* L.	Shrub	Euphorbiaceae
58	*Ficus krishnae* C.DC.	Tree	Moraceae
59	*Ficus religiosa* L.	Tree	Moraceae
60	*Gardenia jasminoides* Ellis.	Shrub	Rubiaceae
61	*Gliricidia sepium* (Jacq.) Kunth ex Walp.	Tree	Fabaceae
62	*Hibiscus rosa-sinensis* L.	Shrub	Malvaceae
63	*Hibiscus sabdariffa* L.	Shrub	Malvaceae
64	*Hibiscus schizopetalus* (Mast.) Hook. f.	Shrub	Malvaceae
65	*Ipomoea cairica* (L.) Sweet.	Climber	Convolvulaceae
66	*Ipomoea hederifolia* L.	Climber	Convolvulaceae
67	*Ixora javanica* (Blume) DC.	Shrub	Rubiaceae
68	*Jatropha gossypiifolia* L.	Shrub	Euphorbiaceae
69	*Justicia gendarussa* Burm. f.	Shrub	Acanthaceae
70	*Lantana camara* L.	Shrub	Verbenaceae
71	*Lantana splendens* Medic.	Shrub	Verbenaceae
72	*Leucaena leucocephala* (Lam.) de Wit.	Tree	Mimosaceae
73	*Manihot carthagenensis subsp. glaziovii*	Tree	Euphorbiaceae

	(Muell.Arg.) Allem.		
74	*Manihot esculenta* Crantz.	Shrub	Euphorbiaceae
75	*Martynia annua* L.	Herb	Pedaliaceae
76	*Mesosphaerum suaveolens* (L.) Kuntz.	Shrub	Lamiaceae
77	*Mikania micrantha* Kunth.	Climber	Asteraceae
78	*Millingtonia hortensis* L. f.	Tree	Bignoniaceae
79	*Mimosa pudica* L.	Herb	Mimosaceae
80	*Mitracarpus hirtus* (L.) DC.	Herb	Rubiaceae
81	*Monoon longifolium* (Sonn.) B. Xue & R.M.K. Saunders.	Tree	Annonaceae
82	*Nerium oleander* L.	Shrub	Apocynaceae
83	*Nyctanthes arbor-tristis* L.	Tree	Nyctanthaceae
84	*Nymphaea nouchali* Burm. f.	Herb	Nymphaeaceae
85	*Ocimum americanum* L.	Herb	Lamiaceae
86	*Passiflora edulis* Sims.	Climber	Passifloraceae
87	*Passiflora foetida* L.	Climber	Passifloraceae
88	*Peperomia pellucida* (L.) Kunth.	Herb	Piperaceae
89	*Phyllanthus urinaria* L.	Herb	Euphorbiaceae
90	*Physalis angulata* L.	Herb	Solanaceae
91	*Pilea microphylla* (L.) Liebm.	Herb	Urticaceae
92	*Pistia stratiotes* L.	Herb	Araceae
93	*Plumeria obtusa* L.	Tree	Apocynaceae
94	*Plumeria rubra* L.	Tree	Apocynaceae
95	*Ponteria crassipes* Mart.	Herb	Pontederiaceae
96	*Psidium guajava* L.	Tree	Myrtaceae
97	*Pueraria phaseoloides* (Roxb.) Benth.	Climber	Fabaceae
98	*Quassia amara L.*	Shrub	Simaroubaceae
99	*Ricinus communis* L.	Shrub	Euphorbiaceae
100	*Samanea saman* (Jacq.) Merr.	Tree	Mimosaceae
101	*Sansevieria roxburghiana* Schult. & Schult.f.	Herb	Dracaenaceae
102	*Scoparia dulcis* L.	Herb	Scrophulariaceae
103	*Senna hirsuta* (L.) H.S.I.	Herb	Caesalpiniaceae
104	*Senna occidentalis* (L.) Link.	Herb	Caesalpiniaceae
105	*Senna tora* (L.) Roxb.	Shrub	Caesalpiniaceae
106	*Simarouba amara* Aubl.	Tree	Simaroubaceae
107	*Solanum diphyllum* L.	Shrub	Solanaceae
108	*Spathodea campanulata* P.Beauv.	Tree	Bignoniaceae
109	*Spermacoce latifolia* Aubl.	Herb	Rubiaceae
110	*Swietenia macrophylla* King.	Tree	Meliaceae
111	*Synedrella nodiflora* (L.) Gaertn.	Herb	Asteraceae
112	*Syzygium malaccense (L) Merr. & Perry*	Tree	Myrtaceae

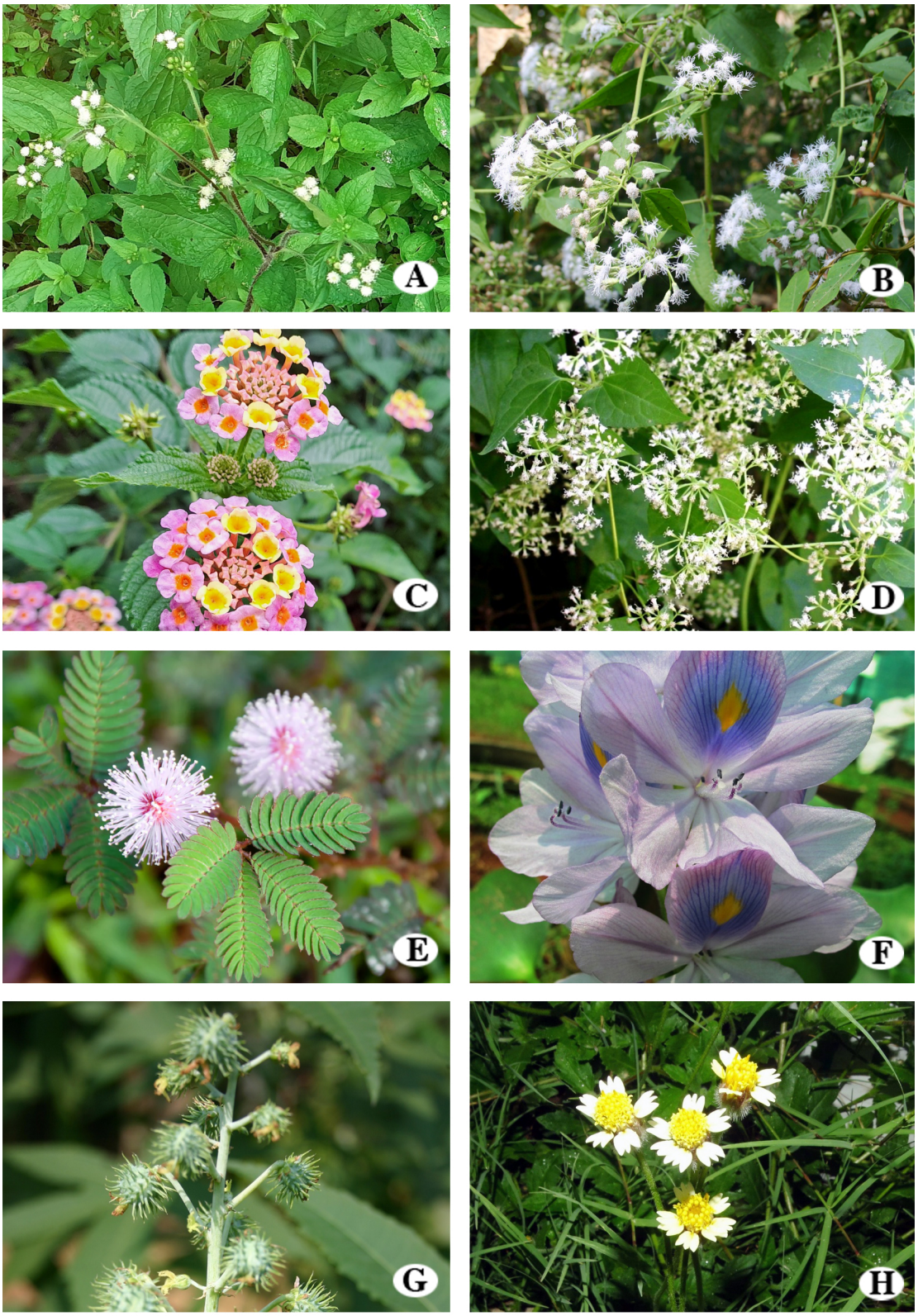


Plate 13. Invasive plant species

A. *Ageratum conyzoids* L.*;* **B**. *Chromolaena odorata* (L.) King & H. Rob.*;*
C. *Lantana camara* L.*;* **D**. *Mikania micrantha* Kunth.*;*
E. *Mimosa pudica* L.*;* **F**. *Ponteria crassipes* Mart.*;*
G. *Ricinus communis* L.*;* **H**. *Tridax procumbens* L.



Plate 14. Exotic plant species
A. *Acacia auriculiformis* Benth.*;* **B.** *Anacardium occidentale* L.;
C. *Annona reticulata* L.*;* **D.** *Bixa orellana* L.; **E.** *Carica papaya* L.*;*
F. *Chrysophyllum cainito* L.*;* **G.** *Citharexylum spinosum* L.*;*
H. *Couroupita guianensis* Aubl.

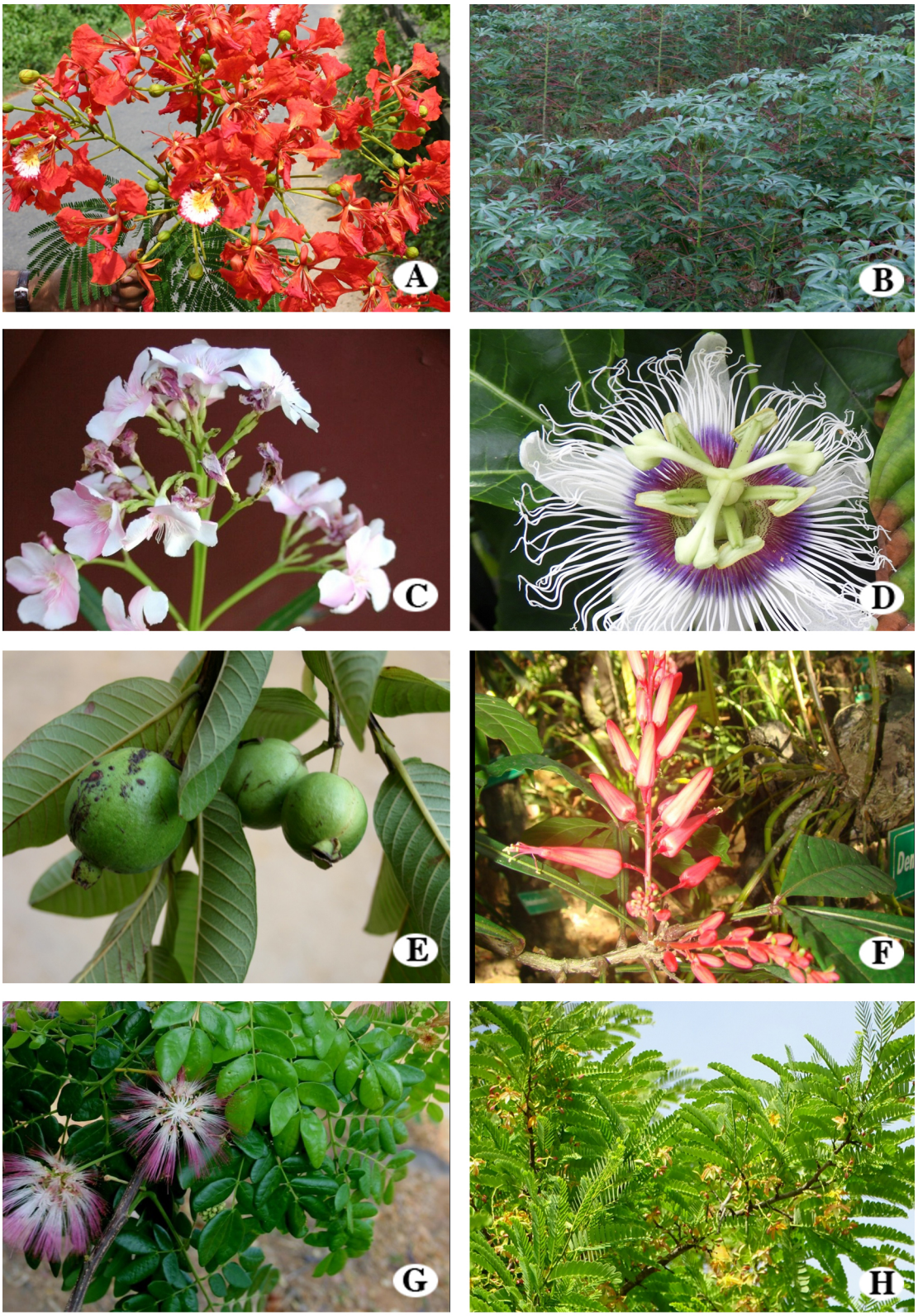


Plate 15. Exotic plant species
A. *Delonix regia* (Boj. ex Hook) Rafin.*;* **B.** *Manihot esculenta* Crantz.*;*
C. *Nerium oleander* L.*;* **D.** *Passiflora edulis* Sims.*;*
E. *Psidium guajava* L.*;* **F.** *Quassia amara* L.*;*
G. *Samanea saman* (Jacq.) Merr.*;* **H.** *Tamarindus indica* L.



Plate 16. Ornamental plant species

A. *Allamanda cathartica* L.; **B.** *Bauhinia acuminata* L.;
C. *Combretum indicum* (L.) De. Philipps.; **D.** *Crossandra infundibuliformis* (L.) Nees.;
E. *Hibiscus rosa-sinensis* L.; **F.** *Ipomoea hederifolia* L.;
G. *Tabernaemontana divaricata* (L.) R. Br.; **H.** *Tecoma stans* (L.) Juss. ex Kunth.



Plate 17. Poisonous plant species

A. *Tragia involucrata* L*;* **B.** *Argemone mexicana* L*;*
C. *Manihot carthagenensis subsp. glaziovii* (Muell.Arg.) Allem*;*
D. *Cleistanthus collinus* (Roxb.) Benth. ex Hook. f;
E. *Cascabela thevetia* (L.) Lippold ; **F.***Caladium bicolor* (Ait. ex Dryand.) Vent;
G. *Bryophyllum pinnatum* (Lam.) Kurz; **H.** *Plumbago indica* L.

113	*Tabernaemontana divaricata* (L.) R. Br.	Shrub	Apocynaceae
114	*Talinum portulacifolium* (Forssk.) Aschers & Schweinf.	Herb	Portulacaceae
115	*Tamarindus indica* L.	Tree	Caesalpiniaceae
116	*Tarlmounia elliptica* (DC.) H. Rob.	Shrub	Asteraceae
117	*Tecoma stans* (L.) Juss. ex Kunth.	Shrub	Bignoniaceae
118	*Terminalia catappa* L.	Tree	Combretaceae
119	*Thunbergia erecta* (Benth.) T. Anderson.	Shrub	Acanthaceae
120	*Tridax procumbens* L.	Herb	Asteraceae
121	*Vigna radiata* (L.) Wilczek.	Herb	Fabaceae
122	*Vitex negundo* L.	Shrub	Verbenaceae

The following ornamental plants are documented from sacred groves of Palakkad district such as *Crossandra infundibuliformis* (L.) Nees, *Quisqualis indica* L., *Allamanda cathartica* L., *Tecoma stans* (L.) HBK, *Hibiscus rosa-sinensis* L. *etc*. (Plate 16).

5.1.2. Enumeration of flora

Flora enumeration starts with the family name in alphabetic order. All plants belonging to the family are described under family category in alphabetic manner. After that synonym, Malayalam name, distribution, brief description about the plant, flowering and fruiting period and important notes are given. Specimens are inspected are given in which grove with available herbarium gathered truncated in to three alphabets and its elaborated name is given in annexure. The elevation from which the plant is gathered is given in sections followed by the date of assortment, name of gatherer, assortment number separately. Finally in bracket the part of plant which was gathered and pressed as herbarium examples Fl. (vegetative part with flower), Fr. (vegetative part with products like fruit) and Fr. & Fl. (vegetative part with flower and fruit) is given. A total of 529 species were reported from 70 sacred groves of Palakkad district and out of 529, 228 herbarium specimens were prepared. The data about the medicinal uses of reported plants are gathered from the books of Udayan and Balachandran (2009) and Warrier *et al* (1994) and from the local people. Notes related to red listed plants collected from the books of Ravikumar *et al* (2000), IUCN (2022) and Nair and Sastry (1987, 1988, 1990).

I. ACANTHACEAE

1.*Andrographis echioides* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 117. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 505. 1884; Gamble, Fl. Pres. Madras 1051(736). 1924; E. Vajr., Fl. Palghat Dist. 341. 1990.

Malayalam Name : Gopuramthangi, Mullen thumba

Distribution : India and Sri Lanka

Erect villous herbs. Leaves simple, opposite decussate, elliptic oblong. Inflorescence axillary, short unilateral racemes. Calyx deeply 5-lobed; lobes linear. Corolla tube white, 2-lipped. Capsules compressed, broadened towards tip, attenuate at base, sparsely hairy towards tip; seeds black, pitted without; retinacula spiny.

Flowering & Fruiting : April-July

Herbarium: Coll.No.36.TVK/PTK/ALT/PKD,29.02.2020, Praveenkumar K.(Fl).

2.*Andrographis lawsonii* Gamble, Bull. Misc. Inform. Kew 1923: 375. 1923 & Fl. Pres. Madras 1050(736). 1924; Sasidh. & Anto in Manoharan *et al.*, Silent Valley-Whispers Reason 136. 1999; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 337. 2004. (Plate 6 D).

Distribution : Southern Western Ghats (Endemic)

Low undershrubs with erect branches. Leaves simple, opposite, ovate, villous along the recurved margins. Flowers in rather long often paniculate racemes, dark brownish-purple. Capsule linear oblong, very glandular hispid.

Flowering & Fruiting : September-December

3.*Andrographis paniculata* (Burm. f.) Wall. ex Nees in Wall., Pl. Asiat. Rar. 3: 116. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 501. 1884; Gamble, Fl. Pres. Madras 1048(734). 1924; Manilal, Fl. Silent Valley 202. 1988; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 337. 2004.*Justicia paniculata* Burm. f., Fl. Ind. 9. 1768.*Andrographis subspathulata* C.B. Clarke in Hook. f., Fl. Brit. India 4: 502. 1884.

Malayalam Name : Kaakanjiram,Kiriyathu,Nilamkanjiram.

Distribution : Peninsular India and Sri Lanka

Slender herbs. Leaves simple, opposite, elliptic. Panicle terminal and upper axillary, glandular-hairy; flowers many, distant. Corolla pink or white with purple dots, tube ventricose, hairy, upper lip entire, midlobe of lower lip broader than laterals, acute, glandular-hairy. Ovary puberulus, style hairy. Capsule oblong, acute, hairy; retinacula spoon shaped; seeds glabrous.

Flowering & Fruiting : March-December

Notes : It is a Medicinal plant. Snake-bite and Scorpion sting: leaf decotion gievn orally, the leaf and paste is applied on the spot of bite. Antipyretic and Anti-inflammatoy: leaf juice is gievn orally. Dysenterey, Dyspepsia and liver diseases: leaf paste or leaf juice is given orally. Bowel complaints and for appetite: leaf juice along with cardamon, cinnamon and cloves is gievn orally Leaf extract used for dysentery, liver complaints and jaundice.

Herbarium: Coll.No.30.VTK/KTR/ALT/PKD,23.02.2020, Praveenkumar K.(Fl).

4.*Barleria cristata* L., Sp. Pl. 636. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 488. 1884; Gamble, Fl. Pres. Madras 1060(743). 1924; E. Vajr., Fl. Palghat Dist. 345. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 339. 2004.

Malayalam Name : Kankambaram, Parvathichedi

Distribution : Indo-Malesia and South China

Shrubs; branches pubescent. Leaves opposite, elliptic. Cymes axillary, dense; flowers pink; bracts linear, ciliate. Capsule oblong.

Flowering & Fruiting : November-March

Notes : It is an Exotic and a Garden plant

Herbarium: Coll.No.74.PTT/TCK/MKD/PKD,18.12.2020, Praveenkumar K.(Fl).

5. *Barleria prionitis* L., Sp. Pl. 636. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 482. 1884; Gamble, Fl. Pres. Madras 1058(741). 1924; E. Vajr., Fl. Palghat Dist. 346. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 340. 2004.

Malayalam Name : Chemmulli, Manjakanakambaram

Distribution : Tropical Africa and Asia

Erect perennial shrubs. Leaves simple, oppositeovate or elliptic. Flowers sessile, often solitary in lower axils. Sepals ovate-lanceolate, subequal, acuminate at apex, appressed-hairy inside. Corolla bilipped, orange-yellow; curved at base, pubescent. Capsules ovoid, compressed; seeds 2, ovoid, flattened on one side, covered with brown appressed hairs.

Flowering & Fruiting : September-February

6. *Blepharis maderaspatensis* (L.) Heyne ex Roth, Nov. Pl. Sp. 320. 1821; C.B. Clarke in Hook. f., Fl. Brit. India 4: 478. 1884; E. Vajr., Fl. Palghat Dist. 346. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 340. 2004.*Acanthus maderaspatensis* L., Sp. Pl. 639. 1753.*Blepharis boerhaviifolia* Pers., Syn. Pl. 2: 180. 1806; C.B. Clarke in Hook. f., Fl. Brit. India 4: 478. 1884; Gamble, Fl. Pres. Madras 1013(712). 1924.

Malayalam Name : Elumbotti, Hemakandi, Murikootipacha

Distribution : Tropical Africa to India

Prostrate herbs. Leaves simple, ternate, unequal, obovate. Flowers axillary; bracts 4 pairs, obovate, margins dentate with stiff elongated hairs, bracteoles spathulate. Corolla tube urceolate, lower lip reduced, upper lip 3 lobed, white or pale blue with a yellow spot and pink nerves. Capsule ovoid, long; seeds 2.

Flowering & Fruiting : November-February

Notes : It is a Medicinal plant

7.*Clinacanthus nutans* (Burm. f.) Lindau, Bot. Jahrb. Syst. 18: 63. 1894; C. Murugan & R. Gopalan, J. Econ. Tax. Bot. 30(2): 299-301. 2006. *Justicia nutans* Burm. f., Fl. Indica 10. 1768.

Malayalam Name : Vishamooli

Distribution : South East Asia

Shrubs. Leaves simple, opposite, lanceolate-ovate, lanceolate, or linear-lanceolate. Racemes 1 to several at or near shoot apex, usually 3 to several forming a terminal panicle. Corolla dull red with a green base, outside gland-

tipped pilose, inside glabrous except for a ring of trichomes. Capsule pilose; seeds in diam.

Flowering & Fruiting : December-April

Notes **:** It is a Medicinal, an Exotic and a Garden plant

8.*Crossandra infundibuliformis* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 98. 1832; Sasidh., Fl. Parambikulam WLS 228. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 340. 2004.*Justicia infundibuliformis* L., Sp. Pl. 21. 1753.*Crossandra undulaefolia* Salisb., Parad. Lond. t. 12. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 4: 492. 1884; Gamble, Fl. Pres. Madras 1055(739). 1924.*Crossandra infundibuliformis* (L.) Nees var. *coccinea* (Dalzell & A. Gibson) M.R. Almeida, Fl. Maharashtra 4A: 25 2003. (Plate 16 D).

Malayalam Name : Manjakkurinji, Kanakambaram, Priyadarshini

Distribution : India and Sri Lanka

Subshrubs. Leaves simple, opposite, elliptic, acute at both ends, usually crowded towards the apex. Spike terminal or rarely axillary, dense. Flowers many, densely packed. Corolla yellow to orange, narrow. Capsule oblong; seeds 4, orbicular.

Flowering & Fruiting : December-March

Notes : It is a Garden plant

Herbarium: Coll.No.42.PBK/KVS/ALT/PKD,15.04.2020, Praveenkumar K.(Fl).

9.*Dicliptera foetida* (Forssk.) Blatt., Rec. Bot. Surv. Ind. 8: 361. 1921.*Justicia foetida* Forssk., Fl. Aeg.-Arab. 5. 1775.*Dicliptera zeylanica* Nees in DC., Prodr. 11: 474. 1847; C.B. Clarke in Hook. f., Fl. Brit. India 4: 552. 1884; Gamble, Fl. Pres. Madras 1073(752). 1924; E. Vajr., Fl. Palghat Dist. 347. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 340. 2004.

Distribution : South India and Sri Lanka

Shrubs. Leaves simple, opposite, elliptic, acute at both ends. Flowers in peduncled axillary cymes; bracts deltoid, cuspidate. Calyx lobes lanceolate,

acuminate. Corolla bluish pink, bilabiate; lobes obtuse. Stamens 2, filaments hairy, anthers in two levels. Capsule clavate, widened above; seeds hirtus.

Flowering & Fruiting : December-April

10.*Ecbolium viride* (Forssk.) Alston in Trimen, Handb. Fl. Ceyl. 6: 229. 1931; Manilal, Fl. Silent Valley 203. 1988.*Justicia viridis* Forssk., Fl. Aeg. Ar. 5. 1774. 1983.*Justicia rotundifolia* Nees in Wall., Pl. Asiat. Rar. 3: 108. 1832.*Ecbolium linneanum* Kurz var. rotundifolia (Nees) C.B.Clarke in Hook. f., Fl. Brit. India 4: 545. 1885; Gamble, Fl. Pres. Madras 1074(752). 1924.*Ecbolium viride* (Forssk.) Alston var. *rotundifolia* (Nees) Raizada, Indian For. Rec. 84: 482. 1958; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 341. 2004.*Ecbolium viride* (Forssk.) Alston var. *chandrasekariana* Remadevi & Binoj., Journ. Econ. Tax. Bot. 25: 236. 2001.

Malayalam Name : Koranda, Odiyamadantha

Distribution : Indo-Malesia and Africa

Woody subshrubs. Leaves simple, opposite, sessile, ovate, acute. Flowers in dense terminal spikes. Calyx 5-partite, connate below; lobes linear. Corolla tube very long and slender, bluish-green; limb 2-lipped, the upper lip narrow, shortly 2-fid, the lower 3-lobed with broad pendent lobes. Fruit an ovoid compressed capsule narrowed into a solid stalk; seeds on curved retinacula.

Flowering & Fruiting : November-February

11.*Eranthemum capense* L., Sp. Pl. 9. 1753; var. *capense*; C.B.Clarke in Hook. f., Fl. Brit. India 4: 525. 1885; Gamble, Fl. Pres. Madras 1078(720). 1924; E. Vajr., Fl. Palghat Dist. 348. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 342. 2004.*Eranthemum montanum* Roxb., Fl. Ind. 1: 100. 1820; Gamble, Fl. Pres. Madras 1025(720). 1924.*Justicia montana* Roxb., Pl. Corom. t. 176. 1798.*Daedalacanthus montanus* (Roxb.) T.Anderson in Thwaites, Enum. Pl. Zeyl. 229. 1860**.**

Distribution : Peninsular India and Sri Lanka

Herbs. Leaves simple, opposite, broadly elliptic, attenuate. Inflorescence terminal or axillary, dense panicle of spikes; glandular, pubescent. Calyx-lobes

5, shortly connate, filamentous, glandular hairy. Corolla blue; tube narrow, pubescent. Capsules oblong, seeds 4, compressed, hygroscopically hairy.

Flowering & Fruiting : January-March

Notes : It is a Medicinal plant

12.*Justicia adhatoda* L., Sp. Pl. 15. 1753; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 344. 2004.*Adhatoda zeylanica* Medic., Hist. & Commen. Acad. Elect. Sci. Theod.-Palat. 6: 393. 1790.*Adhatoda vasica* Nees in Wall., Pl. Asiat. Rar. 3: 103. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 540. 1885; Gamble, Fl. Pres. Madras 1082(758). 1924. (Plate 5 B).

Malayalam Name : Aadalodakam, Valiya adalodakam

Distribution : Indo-Malesia

Evergreen, much-branched perennial shrubs with a strong, odour. Leaves simple, opposite, elliptic-lanceolate or ovate-lanceolate. Flowers in compact, axillary, pedunculate spikes. Calyx, oblong-lanceolate. Corolla white with red or yellow-barred throats; curved, obtuse, notched; lower as long as the upper lip. Fruits clavate, longitudinally channelled, pubescent; seeds globular, glabrous.

Flowering & Fruiting : November-May

Notes : It is a Medicinal plant. Leaves are used to cure asthma, rheumatism, cough and chronic bronchities. Leaves along with rice bran, onion and leaves of Vitex trifolia and Pergularia daemia are heated over steam bath and applied on the chest in bearable warmth for chronic bronchitis and asthma.

Herbarium:Coll.No.133.PBK/KVS/ALT/PKD,27.04.2021, Praveenkumar K.(Fl).

13.*Justicia gendarussa* Burm. f., Fl. Ind. 10. 1768; C.B. Clarke in Hook. f., Fl. Brit. India 4: 532. 1885; Gamble, Fl. Pres. Madras 1079(755). 1924; Manilal, Fl. Silent Valley 205. 1988; Sasidh., Fl. Parambikulam WLS 230. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 345. 2004.*Gendarussa vulgaris* Nees in Wall., Pl. Asiat. Rar. 3: 104. 1832.

Malayalam Name : Vathakodi, Vathamkolli

Distribution : Tropical Africa and Asia

Shrubs. Leaves opposite, linear or oblong-lanceolate,chartaceous, glabrous. Spikes terminal, narrow; bracts linear. Calyx lobes linear-lanceolate. Corolla white with purple streaks. Ovary and style puberulus. Capsule, glabrous.

Flowering & Fruiting : January-April

Notes : It is a Medicinal and an Exotic plant. Paste prepared from leaves used against wounds and skin diseases. Decoction of leaves and tender shoots are given in for chronic rheumatism. The plant is boiled in water and the water is used for taking bath for paralysis. Infusion of the leaves is taken in for facial paralysis.

Herbarium:Coll.No.132.KPB/MLK/ALT/PKD,26.04.2021,Praveenkumar K.(Fl).

14.*Justicia trinervia* Vahl, Enum. Pl. 1: 156. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 526. 1885; Gamble, Fl. Pres. Madras 1079(755). 1924; E. Vajr., Fl. Palghat Dist. 353. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 347. 2004.*Nicoteba trinervis* (Vahl) Lindau, Nat. Pflanzenfam. [Engler & Prantl] iv. 3b 329. 1895. (Plate 11 A).

Distribution : Southern Western Ghats (Endemic)

Procumbent herbs with woody rootstock. Leaves opposite, narrowly elliptic-oblong, obtuse. Spikes terminal. Calyx lobes lanceolate, pubescent, Corolla, pubescent, greenish yellow or white with dark brown streaks; upper lip broadly ovate; lower lip 3-lobed, lobes obtuse, middle lobe twice as broad as the lateral lobes. Filaments pubescent at base. Capsule, pubescent, oblong-clavate; seeds 4, densely tubercled.

Flowering & Fruiting : January-April

15.*Justicia wynaadensis* (Nees) Heyne ex T. Anderson, J. Linn. Soc. Bot. 9: 515. 1867; C.B. Clarke in Hook. f., Fl. Brit. India 4: 533. 1885; Gamble, Fl. Pres. Madras 1079(755). 1924; E. Vajr., Fl. Palghat Dist. 353. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 347. 2004.*Gendarussa wynaadensis* Nees in Wall., Pl. Asiat. Rar. 3: 105. 1832.*Adhatoda wynaadensis* (Nees) Nees in DC., Prodr. 11: 406. 1847. (Plate 11 B).

Distribution : Western Ghats (Endemic)

Subshrubs. Leaves simple, opposite, lanceolate, glabrous. Spike, axillary and terminal, slender. Flowers in distant pairs; hairy. Calyx lobes linear-lanceolate, glandular hairy. Corolla rose coloured; upper lip, oblong, obtuse, slightly notched. Ovary glabrous in the upper half. Capsule, pubescent; seeds 4, obovoid, oblique, minutely rugulose, dark brown.

Flowering & Fruiting : November-March

16.*Lepidagathis incurva* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 119. 1825, var. incurva; Sasidh., Fl. Parambikulam WLS 232. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 348. 2004.*Lepidagathis hyalina* Nees in Wall., Pl. Asiat. Rar. 3: 95. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 521. 1884; Gamble, Fl. Pres. Madras 1068(748). 1924.

Distribution : India, Myanmar and China

Prostrate herbs. Leaves simple, opposite, ovate. Spikes terminal and axillary, clustered. Flowers densely packed. Corolla long, bilabiate, tube short, slender, upper lip entire, lower lip 3-lobed, hairy outside. Capsule long, ellipsoid, hairy at apex; seeds 4, compressed, rugose, brown.

Flowering & Fruiting : February-April

Herbarium: Coll.No.43.TAK/KDB/PKD/PKD,27.04.2020, Praveenkumar K.(Fl).

17.*Phaulopsis dorsiflora* (Retz.) Sant., Kew Bull. 1948: 276. 1948; E. Vajr., Fl. Palghat Dist. 358. 1990. *Ruellia dorsiflora* Retz., Obs. Bot. 6: 31.1791.*Phaulopsis imbricata* acut. non (Forssk.) Sweet., Hort. Brit. (ed. 1) 327. 1827; Sasidh., Fl. Parambikulam WLS 234. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 349. 2004.*Ruellia imbricata* Forssk., Fl. Aeg.-Arab. 113. 1775.*Micranthus oppositifolius* Wendl., Bot. Beobacht 39. 1798; Gamble, Fl. Pres. Madras 1022(718). 1924.

Distribution : Indo-Malesia, China and Africa

Diffuse herbs, branches glandular hairy. Leaves in unequal pairs, elliptic, acuminate at both ends. Spikes axillary; bracts paired, orbicular. Flowers small, scarcely seen above the bracts. Calyx lobes 5, unequal. Corolla bilabiate, tube

slender, lobes obtuse, white with pink spots. Stamens 4, filaments united into an adnated sheath below. Capsule glabrous; seeds 4, compressed.

Flowering & Fruiting : November-March

Herbarium: Coll.No.67.TTN/KVR/CTR/PKD,05.12.2020, Praveenkumar K.(Fl).

18.*Rhinacanthus nasutus* (L.) Kurz, J. Asiat. Soc. Bengal 39: 79. 1870; E. Vajr., Fl. Palghat Dist. 359. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 349. 2004.Justicia nasuta L., Sp. Pl. 16. 1753.*Rhinacanthus communis* Nees in Wall., Pl. Asiat. Rar. 3: 109. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 541. 1885; Gamble, Fl. Pres. Madras 1083(758). 1924.

Malayalam Name : Kottipoo, Nagamulla

Distribution : India, Sri Lanka, Java and Madagascar

Erect shrubs, stem terete. Leaves simple, opposite, elliptic. Flowers in terminal, panicled cymes; white. Capsule clavate, with a lower solid slender stalk, glabrous; seeds 1 or 2 in each cell, rugose.

Flowering & Fruiting : November-February

Notes : It is a Medicinal plant

Herbarium: Coll.No.64.EKK/KGD/CTR/PKD,18.11.2020, Praveenkumar K.(Fl).

19.*Ruellia prostrata* Poir. in Lam., Encycl. 6: 349. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 411. 1884; Gamble, Fl. Pres. Madras 1017(714). 1924.*Dipteracanthus prostratus* (Poir.) Nees in Wall., Pl. Asiat. Rar. 3: 81. 1832; E. Vajr., Fl. Palghat Dist. 347. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 341. 2004.*Ruellia prostrata* Poir. var. *dejecta* (Nees) C.B. Clarke in Hook. f., Fl. Brit. India 4: 412. 1884.

Malayalam Name : Velipadakkam, Thuppalampotti

Distribution : Central and South Africa, Arabian Peninsula, Indian Subcontinent to SW. Pacific Islands

Diffuse herbs. Leaves simple, opposite, ovate. Flowers axillary, 2 or 3 together; bracts absent; bracteoles foliar, ovate. Corolla white or pinkish-white. Stamens

4, didynamous, filaments connate below. Ovary glabrous, style densely hairy. Capsule linear oblong, slightly pubescent; seeds 16-20, orbicular, compressed, marginate, smooth.

Flowering & Fruiting : October-April

Herbarium: Coll.No.79.KVK/KTY/ALT/PKD,21.12.2020, Praveenkumar K.(Fl).

20.*Thunbergia erecta* (Benth.) T. Anderson, J. Linn. Soc. Bot. 7: 18.1864; Gamble, Fl. Pres. Madras 1008(708).1924; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 35. 2004.*Meyenia erecta* Benth. in Hook. Niger. Fl. 476. 1846.

Distribution : Western Tropical Africa, widely cultivated

Erect shrubs. Leaves simple, opposite, ovate or ovate-lanceolate, entire, glabrous. Flowers in axillary, few-flowered racemes; bracts foliaceous, purple-blue, yellowish-white or white, tube pale yellow. Capsules 1. globose below, suddenly narrowed into a barren, sword-shaped beak.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant

II. ALANGIACEAE

21.*Alangium salviifolium* (L. f.) Wang. in Engl., Pflanzenr. Alangiac. 9. 1910, subsp. *salviifolium*; Gamble, Fl. Pres. Madras 572(404). 1919; E. Vajr., Fl. Palghat Dist. 224. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 208. 2004.*Grewia salviifolia* L. f., Suppl. Pl. 409. 1781.*Alangium lamarckii* Thw., Enum. Pl. Zeyl. 133. 1859; Hook. f., Fl. Brit. India 2: 741. 1879.

Malayalam Name : Ankolam, Ankolika, Arinjil.

Distribution : India, Sri Lanka, China, Vietnam, Thailand and Africa

Small trees; branchlets tomentose. Leaves simple, Alternate, oblong, elliptic or ovate. Flowers bisexual, white, fragrant, in axillary cymes or fascicles. Fruit a berry, subglobose, brownish-red, pubescent, crowned with calyx lobes; seed one, ovoid.

Flowering & Fruiting : March-June

Notes : It is a Medicinal plant

III. AMARANTHACEAE

22.*Achyranthes aspera* L., Sp. Pl. 204. 1753, var. aspera; Hook. f., Fl. Brit. India 4: 730. 1885; Gamble, Fl. Pres. Madras 1176(823). 1925; Sasidh., Fl. Parambikulam WLS 253. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 378. 2004.

Malayalam Name : Kadaladi, Vankadaladi, Valiyakadaladi

Distribution : Paleotropics

Large herbs. Leaves simple, opposite, broadly elliptic to obovate. Flowers bisexual, in terminal long spikes, hispid. Flowers deflexed. Tepals subequal, elliptic, acute, glabrous, green or violet. Utricle long, ovoid, brown; seed truncate at apex, rounded at base, brown.

Flowering & Fruiting : October-March

Notes : It is a Medicinal plant. Root is used as a antiodote for snake bite Root inserted to the vagina when labour pain starts for quick and easy delivery. Also used to remove piles.

Herbarium: Coll.No.07.EPN/KVR/CTR/PKD,18.01.2020, Praveenkumar K.(Fl).

23.*Aerva lanata* (Linn.) Juss. Ann. Mus. Hist. Nat. 11: 131. 1808; Boiss., Fl. Or. 4: 993. 1879; Hook. f., Fl. Brit. Ind. 4: 728. 1885; Gamble, Fl. Pres. Madras 1178(825). 1925; E. Vajr., Fl. Palghat Dist. 385. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 379. 2004.

Malayalam Name : Cherula, Cherupula

Distribution : Widespread in the tropics and subtropics

Perennial herbs. Leaves Alternate, suborbicular to ovate-elliptic. Spikes solitary or usually in axillary clusters on the main stems. Flowers bisexual. Tepals densely lanate dorsally, acute with a broad central green vitta along the midrib. Utricle broadly ovoid; seed subglobose, smooth, shining, brown.

Flowering & Fruiting : September-May

Notes : It is a Medicinal plant. The plant is astringent, bitter, cooling, suppurative, diuretic and linthontriptic, and is useful to treat boils, cough, cephalalgia and lithiasis. Root is used against strangury.

Herbarium: Coll.No.39.PMK/NSY/PTB/PKD,23.03.2020, Praveenkumar K.(Fl).

24.*Alternanthera bettzickiana* (Regel) G. Nicholson, Ill. Dict. Gard. 1: 59. 1884.; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 380. 2004.

Malayalam Name : Kaattuponnamgani

Distribution : Native of Tropical America; now getting naturalised in Asia

Erect or ascending, bushy perennial herbs. Leaves opposite, narrowly or more broadly elliptic to oblanceolate or rhomboid-ovate. Heads axillary, sessile, usually solitary. Tepals white, lanceolate, acute, mucronate with the excurrent midrib. Stamens 5. Ovary glabrous.

Flowering & Fruiting : October-February

Notes : It is an Exotic and a Weed plant

Herbarium: Coll.No.31.KNK/PTR/PTB/PKD,23.02.2020, Praveenkumar K.(Fl).

25.*Alternanthera brasiliana* (L.) Kuntze, Rev. Gen. Pl. 2: 537. 1891; C. Pramod & A.K. Pradeep, Fl. Madayippara 421. 2020.

Malayalam Name : Chemcheera

Distribution : Native of tropical America

Erect herbs, stem glabrous to hirsute. Leaves opposite, elliptic. Inflorescence axillary and terminal spikes, subglobose to oblong; bract linear, bracteoles 2. Tepals 5, white, membranous, subequal, outer 3 larger, 3-nerved. Stamens 5. Ovary subglobose, ovule one; stigma penicillate. Fruit subglobose 1 x 1 mm; seed ellipsoid.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Weed plant

26.*Amaranthus spinosus* L., Sp. Pl. 991. 1753; Hook. f., Fl. Brit. India 4: 718. 1885; Gamble, Fl. Pres. Madras 1170(819). 1925; E. Vajr., Fl. Palghat Dist. 387. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 381. 2004.

Malayalam Name : Cherucheera, Kattumullenkeera, Mullencheera

Distribution : Originally from America; now found throughout the warmer regions of the world

Erect glabrous herbs, spines divaricate, sharp. Leaves simple, ovate or elliptic-lanceolate, sometimes with purple blotches on either side of midrib. Flowers in terminal panicled spikes or in axillary, sessile clusters; Male flowers: tepals 5, calycine, unequal. Female flowers: tepals 5, oblong, acute at apex; ovary 1-celled; ovules solitary; stigmas 2-3. Utricle circumcissile; seeds minute, discoid.

Flowering & Fruiting : June-December

Notes : It is a Medicinal, an Exotic and a Weed plant. Juice extracted from roots taken orally by women for the treatment of anemia after child birth

27.*Cyathula prostrata* (L.) Blume, Bijdr. 549. 1826; Hook. f., Fl. Brit. India 4: 722. 1885; Gamble, Fl. Pres. Madras 1172(820). 1925; Sasidh., Fl. Parambikulam WLS 256. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 382. 2004.*Achyranthes prostrata* L., Sp. Pl. (ed. 2) 296. 1762.

Malayalam Name : Cherukadaladi, Chuvannakadaladi

Distribution : Pantropical

Decumbent herbs. Leaves simple, opposite, rhomboid. Spike terminal, slender, solitary. Flowers in groups of 3-5 of which one perfect and Notes neuter; bracts and bracteoles similar, lanceolate, acuminate, pubescent. Utricles obovoid, compressed, golden brown.

Flowering & Fruiting : September-April

Notes : Taking bath using water to which pieces of its roots are added, is supposed to ward off evil spirits.

Herbarium: Coll.No.13.PPM/VZY/OTP/PKD,25.01.2020, Praveenkumar K.(Fl).

28.*Pupalia lappacea* (L.) Juss., Ann. Mus. Natl. Hist. Nat. Paris 2: 132. 1803, var. lappacea; Hook. f., Fl. Brit. India 4: 724. 1885; Gamble, Fl. Pres. Madras 1173(821). 1925; E. Vajr., Fl. Palghat Dist. 389. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 383. 2004.*Achyranthes lappacea* L., Sp. Pl. 204. 1753.*Achyranthes atropurpurea* Lam., Encycl. 1: 546. 1785.*Pupalia atropurpurea* (Lam.) Moq. in DC., Prodr. 13: 331.1849; Hook. f., Fl. Brit. India 4: 723.1885; Gamble, Fl. Pres. Madras 1173(821). 1925.

Distribution : India, Sri Lanka and East Africa

Straggling herbs. Leaves opposite, obovate. Spike terminal, usually unbranched. Flowers sterile and fertile together in distant clusters; bracts orbicular; bracteoles smaller. Tepals 5, elliptic, acute, densely covered with hooked bristles, woody. Stamens 5, filaments united into short tube at base. Ovary obovoid, compressed, style simple, stigma capitate. Utricle biconvex, brown, smooth.

Flowering & Fruiting : September-November

IV. ANACARDIACEAE

29.*Anacardium occidentale* L., Sp. Pl. 583. 1753; Hook. f., Fl. Brit. India 2: 20. 1876; Gamble, Fl. Pres. Madras 260(185). 1918; E. Vajr., Fl. Palghat Dist. 135. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 110. 2004. (Plate 14 B).

Malayalam Name : Kappamavu, Kasumavu, Parangimavu

Distribution : Native of South America; now widely cultivated in Asia and Africa

Gregarious evergreen trees. Leaves simple, Alternate, somewhat crowded at twig apices. Flowers polygamous, yellow, streaked with pink, in terminal bracteate panicles. Fruit a reniform nut, grey, seated on a large pyriform fleshy body formed of enlarged disc and top of the pedicel; pericarp gives acrid caustic oil; seed reniform, ascending.

Flowering & Fruiting : November-April

Notes : It is a Medicinal, an Exotic and an Edible plant. Nuts and fruits are edible. Cashew apple is fibrous and nutritious. The nut and apple are good source of carbohydrates, minerals like Calcium, Potassium, Iron, and Vitamins like riboflavin, thiamine, niacin, vitamin C. The juice of cashew apple is fermented and made wine containing 8.3 per cent alcohol. It is also utilized for making juice, syrup, candy and pickle. The juice (oil) from the nutshell is used for protecting timber, books etc., from white ants. The juice of the nutshell cause painful blisters on the skin. The bark and leaves are useful in toothache and inflammations of gum.

Herbarium:Coll.No.46.MDK/CSY/PTB/PKD ,21.05.2020, Praveenkumar K.(Fl).

30.*Holigarna arnottiana* Hook. f., Fl. Brit. India 2: 36. 1876; Gamble, Fl. Pres. Madras 268(191). 1918; E. Vajr., Fl. Palghat Dist. 136. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 111. 2004. (Plate 10 D).

Malayalam Name : Chera, Cheru, Charu, Kattuchera, Karincheru.

Distribution : Southern Western Ghats (Endemic)

Evergreen trees; exudation milky. Leaves simple, Alternate, crowded at the tips of branchlets, oblanceolate, margin entire. Flowers polygamous, yellowish-brown, in axillary panicles, tomentum of inflorescence pale golden brown. Fruit a drupe, obliquely-ovoid, glabrous, almost entirely included within hypocarp, resinous, acrid; seed parietal.

Flowering & Fruiting : January-July

Notes : It is a Medicinal and a Poison plant

31.*Lannea coromandelica* (Houtt.) Merr., J. Arnold Arbor. 19: 353. 1938; E. Vajr., Fl. Palghat Dist. 137. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 112. 2004.*Dialium coromandelicum* Houtt., Nat. Hist. ser. 2. 2: 39. t. 5. f. 2. 1774.Odina wodier Roxb., Fl. Ind. 2: 293. 1832; Hook. f., Fl. Brit. India 2: 29. 1876; Gamble, Fl. Pres. Madras 263(187). 1918.

Malayalam Name : Anakkaram, Karayam.

Distribution : Indo-Malesia and China

Deciduous trees. Leaves imparipinnate, Alternate, clustered at the end of branchlets; opposite, oblong. Flowers unisexual, yellowish-green. Fruit a drupe, ovoid, red; stone hard; seed compressed.

Flowering & Fruiting : January-May

Notes: It is a Medicinal plant. The bark is useful in cuts, wounds, bruises and ulcerative inflammations of the oral mucosa. The wood not durable, but is suited for carving, turnery and furniture.

32.*Mangifera indica* L., Sp. Pl. 200. 1753; Hook. f., Fl. Brit. India 2: 13. 1876; Gamble, Fl. Pres. Madras 259(185). 1918; E. Vajr., Fl. Palghat Dist. 138. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 112. 2004.

Malayalam Name : Manga, Mampazham, Mavu, Moochi

Distribution : Indo-Malesia

Evergreen trees; exudation yellowish, gummy. Leaves simple, Alternate, clustered at the tips of branchlets. Flowers polygamous, yellowish-green, in terminal panicles; pedicels jointed. Fruit a drupe, oblong-reniform, yellowish-red, mesocarp fleshy, endocarp fibrous; seed subreniform.

Flowering & Fruiting : January-May

Notes : It is an Edible plant. Several horticultural varieties are cultivated, the fruits vary in the shape, size, colour and taste. The fruits are good source of carbohydrates, minerals like Calcium, Potassium, Iron, and Vitamins. The ripe fruits are utilized for making juice, syrup, candy etc. The logs are used for making dug-out boats, building construction etc. Seeds when dried and powdered is made like a porridge. It is a delicious preparation.

Herbarium:Coll.No.63.PKM/CVA/OTP/PKD,17.11.2020, Praveenkumar K.(Fl).

33.*Spondias pinnata* (L. f.) Kurz, Prelim. Rep. For. & Veg. Pegu Append. A.44. & B.42. 1875; E. Vajr., Fl. Palghat Dist. 139. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 114. 2004.*Mangifera pinnata* L. f., Suppl. Pl. 156. 1781.*Spondias mangifera* Willd., Sp. Pl. 2: 751. 1799; Hook. f., Fl. Brit. India 2: 42. 1876; Gamble, Fl. Pres. Madras 261(186). 1918.

Malayalam Name : Ambazham, Kattambazham, Mampuli,

Distribution : Indo-Malesia

Deciduous trees, bark surface grey to pale brown. Leaves imparipinnate, Alternate, clustered at the end of branches; slender, glabrous, swollen at base. Flowers polygamous, yellowish-white, subsessile, in terminal spreading panicles. Fruit a fleshy drupe, yellow, endocarp woody surround by longitudinal interwoven fibres; seeds 1-3, of which only one is perfect, pendulous, oblong.

Flowering & Fruiting : March-December

Notes : It is a Medicinal plant. Fruits edible. Young fruits are used for making pickles. The bark is administered in the cases of dysentery, diarrhea and muscular rheumatism. The juice of the leaves is recommended for local application for ear pain.

V. ANNONACEAE

34.*Annona muricata* L., Sp. Pl. 536. 1753; Debika Mitra in B.D. Sharma *et al.*, Fl. India 1: 206. 1993; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 15. 2004.

Malayalam Name : Cancer chakka, Mullanchakka, Mullaatha

Distribution : Native of Central America and West Indies, introduced elsewhere

Trees, bark pale brown. Leaves simple, Alternate, distichous; elliptic, oblong. Flowers yellowish-green, solitary, axillary or from mature branches. Fruit ovoid to obovoid, green, covered with curved spines, stalks stout; seeds many, reddish-brown.

Flowering & Fruiting : April-October

Notes : It is a Medicinal, an Exotic and an Edible plant. Fruits edible. It is a good source of carbohydrates, fibers, minerals and vitamins. The seed is fish poison and also insecticidal. The roots are considered as antispasmodic and parasiticidal.

35.*Annona reticulata* L., Sp. Pl. 537. 1753; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 78. 1872; Dunn in Gamble, Fl. Pres. Madras 20(14). 1915; E. Vajr., Fl. Palghat Dist. 49. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 16. 2004. (Plate 14 C).

Malayalam Name : Manilanilam, Ramapazham, Aatha

Distribution : Native of Central America and West Indies

Trees. Leaves simple, Alternate, distichous, ovate-lanceolate, oblong. Flowers bisexual, green, several from internodal cymes, rarely leaf opposed. Fruit an aggregate of berry, spherical or ovoid, yellowish-red; areoles flat, rather separated by reticulations of raised ridges; pulp yellowish; seeds dark-brown or black, glossy , oblong and smooth.

Flowering & Fruiting : May-August

Notes : It is a Medicinal, an Exotic and an Edible plant. Fruits edible. It is a good source of carbohydrates, fibers, minerals like Calcium, Potassium, Iron, Vitamins like riboflavin, thiamine, niacin, vitamin C and carotene.

Herbarium:Coll.No.08.PKM/CVA/OTP/PKD,13.01.2020, Praveenkumar K.(Fl).

36.*Annona squamosa* L., Sp. Pl. 537. 1753; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 78. 1872; Dunn in Gamble, Fl. Pres. Madras 20(14). 1915; E. Vajr., Fl. Palghat Dist. 49. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 16. 2004.

Malayalam Name : Aatthachakka, Amruthakka, Seethappazham

Distribution : Native of Central America and West Indies

Trees, brownish or brownish-black. Leaves simple, Alternate, distichous, ovate, ovate-lanceolate or elliptic-oblong. Flowers bisexual, axillary, solitary or a few together, leaf-opposed. Petals greenish-white or yellow, reddish at base inside. Fruit an aggregate of berry, ovoid, greenish, glabrous, tuberculate with rounded tips, glaucous, pulp white; seeds many, black, shining.

Flowering & Fruiting : June-October

Notes : It is an Exotic and an Edible plant. Fruits edible. It contains carbohydrates, fibers, minerals like Calcium, Potassium, iron, Vitamins like riboflavin, thiamine, niacin and vitamin C. Roots are useful in mental

depression and spinal disorders. Hot extracted and hot-pressed seed oil is highly toxic and acting as contact poison to pumpkin beetles, cabbage aphids and houseflies and as stomach poison to sawfly larvae.

37.*Miliusa tomentosa* (Roxb.) Finet & Gagnep., Bull. Soc. Bot. France 4: 153. 1906; Sasidh., Fl. Parambikulam WLS 3. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 18. 2004.*Uvaria tomentosa* Roxb., Pl. Corom. t. 35. 1795.*Saccopetalum tomentosum* (Roxb.) Hook. f. & Thoms., Fl. Ind. 152. 1855 & in Hook. f., Fl. Brit. India 1: 88. 1872; Dunn in Gamble, Fl. Pres. Madras 22(16). 1915.

Malayalam Name : Kanakaitha, Kaithamavu, Thavidi

Distribution : India, Nepal and Sri Lanka

Deciduous trees. Leaves simple, Alternate, distichous. Flowers bisexual, greenish-yellow, solitary or a few together. Fruit aggregate of berries, fruitlets subglobose, tapering to base, succulent, purple, stalk stout long; seeds 4-5.

Flowering & Fruiting : October-May

38.*Monoon longifolium* (Sonn.) B. Xue & R.M.K. Saunders, Taxon 61: 1032. 2012; I.M. Turner, Nordic J. Bot. 33: 280. 2015.*Uvaria longifolia* Sonn., Voy. Aux. Indes 2: 233. pl.131. 1782.*Polyalthia longifolia* (Sonn.) Thwaites Enum. Pl. Zeyl. 398. 1864; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 62. 1872; Dunn in Gamble, Fl. Pres. Madras 16(11). 1915; E. Vajr., Fl. Palghat Dist. 49. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 20. 2004.

Malayalam Name : Aranamaram, Cherunna, Choranna

Distribution : Native of Sri Lanka, introduced to many tropical countries

Tall trees. Leaves simple, Alternate, distichous, ovate-lanceolate or lanceolate. Flowers bisexual, green. Sepals ovate-triangular, pubescent, connate at base. Petals 6 subequal, linear. Fruit aggregate of berries; berry ovoid to ellipsoid, obtuse at both ends, glabrous, reddish to black; seed one, almost ovoid, smooth or slightly grooved, pale brown, shiny.

Flowering & Fruiting : March-August

Notes : It is a Medicinal, an Exotic and a Garden plant

39.*Uvaria narum* (Dunal) Wall. ex Hook. f. & Thoms., Fl. Ind. 102.1855 & in Hook. f., Fl. Brit. India 1: 50.1872; Dunn in Gamble, Fl. Pres. Madras 13(9). 1915; E. Vajr., Fl. Palghat Dist. 49. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 21. 2004.*Unona narum* Dunal, Monogr. Anonac. 99. 1817, p.p.*Uvaria narum* Wall. ex Hook. f. & Thoms. var. *macrophylla* Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 50. 1872, p.p.; Dunn in Gamble, Fl. Pres. Madras 13(9). 1915.

Malayalam Name : Korandapazham,Kooril, Koorilvalli.

Distribution : South India and Sri Lanka

Scandent shrubs. Leaves simple, Alternate, distichous, elliptic, lanceolate. Flowers solitary, leaf opposed; tomentose. Fruit aggregate of berries; fruitlets subglobose or oblong, yellow, when single seeded globose, smooth.

Flowering & Fruiting : November-June

Notes : It is a Medicinal plant

Herbarium: Coll.No.47.SVK/CSY/PTB/PKD,21.05.2020, Praveenkumar K.(Fl).

VI. APIACEAE

40.*Centella asiatica* (L.) Urban in Mart., Fl. Bras. 11: 287. t.78. f. 1879; Gamble, Fl. Pres. Madras 556(392). 1919; E. Vajr., Fl. Palghat Dist. 222. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 204. 2004.*Hydrocotyle asiatica* L., Sp. Pl. 234. 1753. **Araliaceae** (APG). (Plate 4 D).

Malayalam Name : Kodangal, Kuthirakkulambuchedi, Mutthil,

Distribution : Tropical Asia and Africa

Prostrate herbs. Leaves simple, Alternate, orbicular-reniform, crenate or sub-entire, glabrous. Flowers sessile, pink, in 2-5 flowered umbels; peduncles axillary. Fruit ovoid, reticulate-rugose, 7-9-ribbed.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant. Leaf juice is taken for nerve and blood diseases and diabetes.

Herbarium: Coll.No.143.CST/TVP/PTB/PKD,13.06.2021, Praveenkumar K.(Fl).

VII. APOCYNACEAE

41.*Allamanda cathartica* L., Mant. 2: 214. 1771; Gamble, Fl. Pres. Madras 821(577). 1923; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 280. 2004. (Plate 16 A).

Malayalam Name : Manjakolambi, Kolaambi

Distribution : Native of Tropical America; now naturalised in the tropics of the world

Straggling shrubs. Leaves 3-4 in a whorl, elliptic or broadly oblong, subcoriaceous. Flowers in terminal or axillary short-peduncled cymes. Corolla yellow, funnel-shaped; tube inflated above the middle, throat densely villous. Ovary bilocular; stigma ovoid with a basal ring like appendage.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic, a Garden and a Poison plant. There are several cultivars of *Allamanda cathartica*. The commonly grown cultivars in Kerala are (i)' *Hendersonii*': Climbers; stem almost glabrous; leaves coriaceous; flowers outer side of lobes and vertically inside the dilated portion of the corolla stained reddish-brown (ii) '*Grandiflora*': Stragglers; leaves more leathery, smaller, glabrescent, oblong-elliptic; flowers densely clustered, inner side of the dilated portion of the corolla tube with thin vertical reddish brown lines.

42.*Alstonia scholaris* (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; Hook. f., Fl. Brit. India 3: 642. 1882; Gamble, Fl. Pres. Madras 810(569). 1923; E. Vajr., Fl. Palghat Dist. 278. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 280. 2004. (Plate 2 A).

Malayalam Name : Ezhilamppala, Pala, Yekshippala

Distribution : South and South East Asia to Australia

Large trees. Leaves simple, in whorls, obovate, oblanceolate or obovate-oblong. Flower bisexual, greenish-white in terminal umbellate cymes. Fruit of two linear, narrow, pendulous follicular mericarps, green; seeds flat, with tufts of hairs at both ends.

Flowering & Fruiting : October-February

Notes : It is a Medicinal plant. The bark and tender leaves are useful in skin diseases, itching and tumors ulcers with foul discharges. The wood is perishable, used for making match splints, pencil slats, handicrafts etc.

Herbarium:Coll.No.70.ANK/TCK/MKD/PKD,15.12.2020,Praveenkumar.K.(Fl).

43.*Cascabela thevetia* (L.) Lippold, Feddes Repert. 91: 52. 1980.*Thevetia peruviana* (Pers.) Merr., Philipp. J. Sci. 9: 130. 1914; E. Vajr., Fl. Palghat Dist. 284. 1990 Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 285. 2004.*Cerbera peruviana* Pers., Syn. 1: 267. 1805.*Thevetia neriifolia* Juss ex Steud., Nomencl. Bot. (ed. 2) 2: 680. 1841; Gamble, Fl. Pres. Madras 821(577). 1923. (Plate 17 E).

Malayalam Name : Manja-arali, Mathaarali, Pachchaarali

Distribution : Native of Tropical America; now Pantropical

Large shrub to small trees. Leaves Alternate, clustered near tips of branches, linear-lanceolate, glabrous. Flowers in sub-terminal cymes, golden-yellow, white or dull-red, Seeds few strongly flattened.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Poison plant

44.*Holarrhena pubescens* (Buch.-Ham.) Wall. ex G. Don, Gen. Hist. 4: 78. 1837-1838; E. Vajr., Fl. Palghat Dist. 280. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 282. 2004.*Echites pubescens* Buch.-Ham., Trans. Linn. Soc. London 13: 521. 1821.*Echites antidysenterica* Roth in Roem. & Schult., Syst. Veg. 4: 394. 1819, non (L.) Roxb. ex Flem. 1810.*Holarrhena antidysenterica* (Roth) A. DC. in DC., Prodr. 8: 413. 1844; Hook. f., Fl. Brit. India 3: 644. 1882; Gamble, Fl. Pres. Madras 811(570). 1923.*Holarrhena malaccensis* Wight, Icon. Pl. Ind. Orient. t. 1298. 1848. (Plate 3 E).

Malayalam Name : Kadalapala, Kadavelapparintholi, Kudagapala

Distribution : Indo-Malesia

Small deciduous trees. Leaves simple, opposite, broadly ovate, ovate-oblong or ovate-lanceolate. Flowers bisexual, creamy-white, slightly fragrant, in terminal

and axillary corymbose cymes, appear along with new leaves. Fruit of 2 terete elongated follicular mericarps connected at the tip and then free; seeds, oblong, with tuft of silky brown hairs at the apex.

Flowering & Fruiting : April-October

Notes : It is a Medicinal plant. Bark is used against piles, diarrhoea. Haemorrhages, indigestion and skin diseases. A decoction of the seeds with little honey is very beneficial in diarrhoea and dysentery. Decoction of bark is useful against bleeding piles. Juice extracted from bark taken for the cure of dysentery

Herbarium:Coll.No.71.TBK/TCK/MKD/PKD,16.12.2020.,Praveenkumar K.(Fl).

45.*Ichnocarpus frutescens* (L.) R. Br. in Ait.f., Hort. Kew. (ed. 2) 2: 69. 1811; Hook. f., Fl. Brit. India 3: 669. 1882; Gamble, Fl. Pres. Madras 820(577). 1923; E. Vajr., Fl. Palghat Dist. 281. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 282. 2004.*Apocynum frutescens* L., Sp. Pl. 213. 1753.

Malayalam Name : Illamkettu, Palvalli, Parvalli

Distribution : Indo-Malesia and Australia

Climbers. Leaves simple, opposite, brown-pubescent below. Flowers, in terminal or axillary panicled cymes. Calyx, lobes ovate, acute, pubescent. Corolla white, salver shaped, contracted at mouth, hairy inside, throat densely white-villous. Mericarps follicular, , slender, rusty puberulus; seeds many, compressed, crowned with long silky hairs.

Flowering & Fruiting : August-March

Notes : It is a Medicinal plant

Herbarium:Coll.No.73.ASK/TCK/MKD/PKD,17.12.2020, Praveenkumar K.(Fl).

46.*Nerium oleander* L., Sp. Pl. 209. 1753; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 283. 2004;.*Nerium indicum* Mill., Gard. Dict. (ed. 8) 2. 1786.*Nerium odorum* Soland. in Ait., Hort. Kew (ed. 1) 1: 297. 1789; Hook. f., Fl. Brit. India 3: 655. 1882; Gamble, Fl. Pres. Madras 821(577). 1923. (Plate 15 C).

Malayalam Name : Arali, Chuvanna-arali, Velutha-alari

Distribution : From Mediterranean through Persia, Afghanistan to West Himalayas, cultivated elsewhere

Evergreen shrubs with milky juice. Leaves opposite, linear-lanceolate, parallel; petiole. Flowers white, pink or dark red, single or double in cultivated forms, fragrant, peduncle and pedicel hairy, bracts small. Ovary with two distinct carpels, style filiform, thickened upward; stigma two lobed.

Flowering & Fruiting : November-May

Notes : It is a Medicinal, an Exotic, a Garden and a Poison plant. There are several horticultural varieties which vary in the colour and size of flowers.

Herbarium:Coll.No.144.KDK/VZY/OTP/PKD,13.06.2021,Praveenkumar K.(Fl).

47.*Plumeria obtusa* L., Sp. Pl. 210. 1753.

Malayalam Name : Simaiyalari, Vellachampakam, Velutharali

Distribution : Central America, from Mexico to Panama

Deciduous trees. Leaves simple, Alternate spiral, clustered. Flowers bisexual, white, in terminal corymbose stout cymes. Fruit an aggregate of 2 follicle, pustulate; seeds winged.

Flowering & Fruiting : November-June

Notes: It is an Exotic and a Garden plant. The cultivar. - Dwarf Singapore Pink, with narrow pink flower is now grown in gardens

48.*Plumeria rubra* L., Sp. Pl. 209. 1753; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 283. 2004.*Plumeria rubra* L. forma acutifolia (Poir.) Woods. in Poir., Encycl. Suppl. 2: 667. 1812; Hook. f., Fl. Brit. India 3: 641. 1882; E. Vajr., Fl. Palghat Dist. 284. 1990. (Plate 2 G).

Malayalam Name : Alari, Arali.

Distribution : Native of Tropical America; widely naturalised elsewhere in the tropics

Deciduous trees; latex milky. Leaves simple, Alternate spiral, clustered, obovate-spathulat. Flowers bisexual, in terminal corymbose stout cymes. Corolla pink or cream with yellow centre; expanded from above the middle. Fruit an aggregate of 2 follicle, pustulate; seeds winged.

Flowering & Fruiting : November-April

Notes : It is an Exotic and a Garden plant

Herbarium:Coll.No.217.VGK/VZY/OTP/PKD,27.12.2022,Praveenkumar K.(Fl).

49.*Tabernaemontana alternifolia* L., Sp. Pl. 211.1753.*Tabernaemontana heyneana* Wall., Bot. Reg. 15: t. 1273. 1829; Hook. f., Fl. Brit. India 3: 646. 1882; E. Vajr., Fl. Palghat Dist. 283. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 285. 2004.*Ervatamia heyneana* (Wall.) Cooke, Fl. Pres. Bombay 2: 134.1904; Gamble, Fl. Pres. Madras 813(572).1923; V.S. Ramach. & V.J. Nair, Fl. Cannanore Dist. 277. 1988. (Plate 12 F).

Malayalam Name : Kundalappala, Kunninpala, Kuruttupala,

Distribution : Southern Western Ghats (Endemic)

Large shrubs to small trees; bark corky with shallow fissures, latex milky. Leaves simple, opposite, elliptic-oblong. Cymes terminal or axillary. Flowers pedicellate. white.Follicles yellow, beak acuminate; seeds covered by red pulp.

Flowering & Fruiting : April-October

Notes : It is a Medicinal plant

Herbarium:Coll.No.77.PBK/KVS/ALT/PKD, 19.12.2020., Praveenkumar K.(Fl).

50.*Tabernaemontana divaricata* (L.) R. Br. in Roem. & Schult., Syst. Veg. 4: 427. 1819; Biodiv. Doc. Kerala- Fl. Pl. 284. 2004.*Nerium divaricatum* L., Sp. Pl. 209. 1753.*Tabernaemontana coronaria* (Jacq.) Willd., Enum. Hort. Berol. 275. 1809; Sunil & Sivad., Fl. Alappuzha Dist. 436. 2009. *Nerium coronarium* Jacq., Coll. Bot. 1: 138. 1786.*Ervatamia coronaria* (Jacq.) Stapf in Dyer, Fl. Trop. Africa 4: 127. 1902; Gamble, Fl. Pres. Madras 813(571). 1923.*Ervatamia divaricata* (L.) Burkill, Rec. Bot. Surv. Ind. 10: 320. 1925. (Plate 16 G).

Malayalam Name : Kattampala, Nandhiyar-vattom

Distribution : Native of Southern Himalayas

Shrubs or small trees. Leaves opposite, pairs equal or unequal, elliptic or narrowly elliptic. Flowers fragrant, white in colour. Fruit of 2 separate mericarps, orange, red or less often green, obliquely and narrowly ellipsoid. Seeds 2-10, aril deep orange or red.

Flowering & Fruiting : Throughout the year

Notes: It is a Medicinal, an Exotic and a Garden plant, A miniature type with small flowers is now common in the gardens

Herbarium:Coll.No.124.PBK/KVS/ALT/PKD,11.04.2021, Praveenkumar K.(Fl).

51.*Wrightia tinctoria* (Roxb.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 47. 1811; Hook. f., Fl. Brit. India 3: 653. 1882; Gamble, Fl. Pres. Madras 815(573). 1923; E. Vajr., Fl. Palghat Dist. 283. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 285. 2004.*Nerium tinctorium* Roxb., Orient. Repert. 1: 39. 1791.

Malayalam Name : Dhanthappala, Kotakappala

Distribution : India, southeast Asia and Australia.

Deciduous trees; bark grey, latex milky white. Leaves simple, opposite, distichous, oblong-lanceolate or elliptic-ovate. Flower bisexual, white, scented, in terminal cymes appearing along with new leaves.. Fruit of 2 follicular mericarps, slender, smooth, green, cylindric, cohering at the tip; seed black, comate at one end.

Flowering & Fruiting : February-November

Notes : It is a Medicinal plant.

The leaves are useful to treat leprosy, psoriasis, bleeding piles. The latex of the bark and unripe fruits are used by hill tribes for coagulating and solidifying milk. The perishable wood is soft and smooth, used for making toys, drawing instruments, turnery etc.

VIII. ARACEAE

52.*Amorphophallus paeoniifolus* (Dennst.) Nicolson var. paeoniifolus Sivad., Taxon 32: 128. 1983; Sasidh., Fl. Parambikulam WLS 364. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 509. 2004.*Dracontium paeoniifolium* Dennst., Schluss. Hort. Malab. 38. 1818.*Amorphophallus dubius* Blume, Rumphia 1: 142. 1837; Hook. f., Fl. Brit. India 6: 514. 1893; C.E.C. Fisch. in Gamble Fl. Pres. Madras 1587(1107). 1931. (Plate 6 B).

Malayalam Name : Kattuchena, Chena

Distribution : India, Sri Lanka and Pacific Islands

Herbs. Leaves tri-sect; leaflets sessile, greenish above, paler below. Spathe margin undulate, tip acute; outside greenish yellow with green blotches at base, pale brownish with pale yellow blotches above; brownish green with prominent murications at base within, pale green above. Spadix sessile. Female flowers dense, each with ovary sub-globose, style pinkish brown. Fruits green, reddish at maturity; seeds 1-2.

Flowering & Fruiting : May-November

Notes : It is a Medicinal plant

Herbarium:Coll.No.48.ANK/TCK/MKD/PKD,22.05.2020,Praveenkumar K.(Fl).

53.*Caladium bicolor* (Ait. ex Dryand.) Vent., Descr. Pl. Nouv. t. 30. 1801 & Arch. Bot. 2: 348. 1801; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 512. 2004.Arum bicolor Ait. ex Dryand., Hort. Kew. (ed. 1) 3: 316. 1789. (Plate 17 F).

Malayalam Name : Pullichembu, Varnachembu

Distribution : South America; naturalised in the tropics

Cormous annual herbs. Leaves peltate, broadly ovate to suborbicular, acute. Spadix; stipe constricted below in the middle. Pistillate-flowered portion green, pistillate flowers; ovary obovoid, green, intermixed with staminodia. Staminate-flowered portion clavate- cylindric; staminate flowers many, synandrium formed of 5-12 stamens, many-angled, rhomboidal at top, truncate. Neuter-flowered portion; neuters elongate-elliptic, white.

Flowering & Fruiting : December-January

Notes : It is an Exotic, a Garden and a Poison plant

Herbarium:Coll.No.55.PPM/VZY/OTP/PKD,09.06.2020, Praveenkumar K.(Fl).

54.*Colocasia esculenta* (L.) Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; E. Vajr., Fl. Palghat Dist. 533. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 512. 2004.*Arum esculentum* L., Sp. Pl. 965. 1753.*Arum colocasia* L., Sp. Pl. 965. 1753.*Colocasia antiquorum* Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; Hook. f., Fl. Brit. India 6: 523. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1580(1102). 1931.

Malayalam Name : Chembu

Distribution : Pantropical

Herbs. Leaves few to many, peltate, ovate, cordate to sagittate at base, glabrous. Spadix cylindrical, appendages terete, obtuse. Male flowers above, stamens 6; female flowers on lower; ovary 1-celled, ovules many on 2-4 parietal placentas. Neutral flowers many, peltate, between the female and male flowers. Fruit an aggregate of berries, globose.

Flowering & Fruiting : May-October

Notes: It is a Medicinal and a Garden plant. Very variable species. There are many edible as well as ornamental cultivars. cultivar 'blacky' with purple-black petiole and greenish-blue lamina is grown as a garden plant.

55.*Pistia stratiotes* L., Sp. Pl. 963. 1753; Hook. f., Fl. Brit. India 6: 497. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1573(1097). 1931; E. Vajr., Fl. Palghat Dist. 535. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 513. 2004**.**

Malayalam Name : Muttapayal

Distribution : Tropics and subtropics

Aquatic stemless, stoloniferous, floating herbs. Leaves sessile, tufted, obovate, veins prominent, white soft pubescent. Spathe small, basal portion convoluted, upper portion expanded into an ovate-acute limb, pale yellow. Spadix with

pistillate portion adnate to the spathe. Female and male flowers separated by a disc-like structure. Male flowers with 4-6 anthers forming a synandrium. Ovary 1-locular; ovules many, on parietal placentae. Berry small and ovoid.

Flowering & Fruiting : October-March

Notes : It is an Exotic and a Weed plant

56.*Pothos scandens* L., Sp. Pl. 968. 1753; Hook. f., Fl. Brit. India 6: 551. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1592(1110). 1931; E. Vajr., Fl. Palghat Dist. 535. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 514. 2004.

Malayalam Name : Anapparuva, Paruvakodi, Paruval, Varivalli

Distribution : India to Malesia and Madagascar

Climbers. Leaves, lanceolate, apex acuminate. Inflorescence axillary; Spathe ovate or ovate-oblong, cymbiform, erect, cuspidate, green or purplish brown. Spadix globose, ellipsoid or obovoid, white or yellow, stipitate; stipe deflexed. Flowers densely packed bisexual, green.. Berry oblong, scarlet; seeds stony, oblong.

Flowering & Fruiting : October-November

Notes : It is a Medicinal plant

Herbarium: Coll.No.81.CTV/VPZ/PTB/PKD, 25.12.2020., Praveenkumar K.(Fl).

IX. ARECACEAE

57.*Areca catechu* L., Sp. Pl. 1189. 1753; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 405. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1555(1085). 1931; E. Vajr., Fl. Palghat Dist. 525. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 504. 2004.

Malayalam Name : Chempalukka, Kavungu, Kazhangu, Pakku

Distribution : Cultivated from India to the Solomon Islands and less commonly in Africa and Tropical America

Stem erect. Leaves in a terminal crown; leaflets many, linear or linear-lanceolate. Spadices several on the axils of fallen leaves. Spathes boat-like, coriaceous. Flowers monoecious; lower ones female. Male flowers: ovate, white; stamens 6;

pistillode 2-fid. Female flowers: ; sepals obovate;;ovary, oblong, 1-celled, ovule solitary. Fruit with fibrous mesocarps, orange-red in colour.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant. Nut is edible. Leaf sheath is used for making baskets to draw water from the well.

Herbarium:Coll.No.221.PKM/CVA/OTP/PKD,13.01.2023,Praveenkumar.K.(Fl)

58.*Borassus flabellifer* L., Sp. Pl. 1187. 1753; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 482. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1562(1090). 1931; E. Vajr., Fl. Palghat Dist. 526. 1990;Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 504. 2004.*Borassus flabelliformis* Murr. in L., Syst. Veg. (ed. 13) 827. 1774. (Plate 1 A).

Malayalam Name : Ampana, Karimbana

Distribution : Native of Africa; introduced & cultivated in Indo-Malesia and Australia

Dioecious palm. Leaves simple, palmate, plicately multifid. Spadices interfoliar, large, dioecious, branched. Petals 3, obovate-spathulate. Drupes globose, yellow-purple when ripe, with 1-3 compressed pyrenes.

Flowering & Fruiting : March-September

Notes : It is a Medicinal, an Exotic and an Edible plant

59.*Caryota urens* L., Sp. Pl. 1189. 1753; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 422. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1560(1089). 1931; E. Vajr., Fl. Palghat Dist. 529. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 506. 2004. (Plate 2 C).

Malayalam Name : Aanapana, Choondappana, Eerumbana

Distribution : Southern India, Sri Lanka and Bangladesh

Monoecious stout palms. Leaves bipinnate. Spadix interfoliar, shortly peduncled, much branched, pendulous; spathes few. Flowers many, in triads with female flower in the middle. Fruit globose, reddish purple; seeds plano-convex, subreniform.

Flowering & Fruiting : January-April

Notes : It is a Medicinal plant

60.*Cocos nucifera* L., Sp. Pl. 1188. 1753; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 482. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1557(1086). 1931; E. Vajr., Fl. Palghat Dist. 529. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 506. 2004.

Malayalam Name : Nalikeram, Thenga, Thengu

Distribution : Cultivated throughout the tropics

Erect trees with annular petiolar scars. Leaves pinnatisect; leaflets reduplicate. Spadices interfoliar, panicled. Spathe oblong, woody. Flowers monoecious, subsessile. Male flowers: often paired. Sepals ovate. Petals ovate, woody, yellowish-brown. Female flowers 1-3 per branch, basal. Drupe ovoid or globose, trigonous; pericarp fibrous; endocarp stony; seed coherent with the endocarp.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and an Edible plant. There are many cultivars which vary in the height of the plant, size, shape and colour of the fruits from green, orange and yellow.

61.*Corypha umbraculifera* L., Sp. Pl. (ed. 2) 1657. 1763; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 428. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1561(1089). 1931; E. Vajr., Fl. Palghat Dist. 529. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 506. 2004. (Plate 7 A).

Malayalam Name : Kodappana, Sitalam, Talippana, Thaaravupana

Distribution : Widely cultivated in Peninsular India and Sri Lanka

Monocarpic palms. Leaves costapalmate, orbicular. Inflorescence terminal, about 6 m long; primary flower branches arise horizontally from the main axis; ultimate flower branches (rachillae) white, smooth. Flowers bisexual, arranged in clusters of 3-6 flowers. Fruit globose; seeds smooth and very hard.

Flowering & Fruiting : November-June

Notes : It is a Medicinal plant

X. ARISTOLOCHIACEAE

62.*Aristolochia indica* L., Sp. Pl. 960. 1753; Hook. f., Fl. Brit. India 5: 75. 1886; Gamble, Fl. Pres. Madras 1202(841). 1925; E. Vajr., Fl. Palghat Dist. 394. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 388. 2004.*Aristolochia lanceolata* Wight, Icon. Pl. Ind. Orient. t. 1858. 1852.*Aristolochia indica* L. var. lanceolata (Wight) Duch. in DC., Prodr. 15: 479.1864.

Malayalam Name : Garudakodi, , Karalakam,

Distribution : Indo-Malesia

Twining perennial herbs. Leaves simple, Alternate, ovate-lanceolate or ovate-oblong. Flowers in few-flowered axillary racemes; elongate in fruits. Perianth tube dull brown, greyish-green. Capsule globose-pyriform, 6-ridged, dehiscing from the base.

Flowering & Fruiting : July-March

Notes: It is a Medicinal plant. Juice of leaves is taken in for snake bite. Plant is used as a veterinary medicine.

63.*Aristolochia ringens* Vahl, Symb. Bot. 3: 99. 1794.

Malayalam Name : Garudapoovu, Mayilpoovu

Distribution :Native of South and Central America, introduced elsewhere

Climbing glabrous shrubs. Leaves Alternate, orbicular-cordate, pale green above, glaucous beneath. Flowers axillary, solitary; greenish, marked with dark purple. Capsule oblong-pyriform, after dehiscence parachute-like; seeds numerous, broadly deltoid, flat, winged.

Flowering & Fruiting : January-June

Notes : It is a Medicinal, an Exotic and a Garden plant

XI. ASCLEPIADACEAE

64.*Calotropis gigantea* (L.) R. Br. in Ait.f., Hort. Kew (ed. 2) 2: 78. 1811; Hook. f., Fl. Brit. India 4: 17. 1883; Gamble, Fl. Pres. Madras 832(585). 1923; E. Vajr., Fl.

Palghat Dist. 285. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 286. 2004.*Asclepias gigantea* L., Sp. Pl. 214. 1753. **Apocynaceae** (APG). (Plate 4 C).

Malayalam Name : Dinesam, Erikku, Vella-erikku, Yerikku

Distribution : Tropical Asia

Shrubs.Leaves simple, opposite, smaller in branchlets. Flowers pale purple, white or greenish-white. Fruit saccate, ovoid, ventricose; seeds many, broadly ovate, flattened, narrowly margined, minutely tomentose.

Flowering & Fruiting : Throughout the year

Notes: It is a Medicinal and a Poison plant. Leaves slightly warmed over fire and applied over body or chest against rheumatic pain.

Herbarium:Coll.No.141.PAT/LPR/OTP/PKD,12.06.2021., Praveenkumar K.(Fl).

65.*Ceropegia candelabrum* L. var. *biflora* (L.) M.Y. Ansari, Fasc. Fl. Ind. 16: 12. 1984; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 287. 2004. *Ceropegia biflora* L. Sp. Pl. 211. 1753.*Ceropegia candelabrum* L. subsp. *tuberosa* (Roxb.) H. Huber in Dassan. & Fosberg, Rev. Handb. Fl. Ceylon 4: 120. 1983.*Ceropegia tuberosa* Roxb., Pl. Corom. t. 9. 1795; Hook. f., Fl. Brit. India 4: 70. 1883; Gamble, Fl. Pres. Madras 857(603). 1923; E. Vajr., Fl. Palghat Dist. 287. 1990. **Apocynaceae** (APG).

Malayalam Name : Thirinagathumba

Distribution : India and Sri Lanka

Twining herbs. Leaves slightly obovate or oblong, mucronate, membranous. Cymes axillary, umbellate, few flowered. Corolla bulbous at base, prominently veined, straight, tube slightly curved. Follicles paired, terete, long beaked, ovate to elliptic.

Flowering & Fruiting : August-January

66.*Cosmostigma cordatum* (Poir.) M.R. Almeida, Fl. Maharashtra 3A: 239 2001.Periploca cordata Poir. in Lam. Encycl. 5: 191. 1804.*Cosmostigma racemosum* (Roxb.) Wight, Contrib. Bot. Ind. 42. 1834 & Ic. t. 591. 1842; Hook. f., Fl. Brit. India 4: 46. 1883; Gamble, Fl. Pres. Madras 846(595). 1923; Sasidh., Fl.

Parambikulam WLS 194. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 289. 2004.*Asclepias racemosa* Roxb., Fl. Ind. 2: 32. 1832.*Cosmostigma acuminatum* Wight, Icon. Pl. Ind. Orient. t. 1270. 1848. **Apocynaceae** (APG).

Malayalam Name : Kariveppilakurinji, Vattuvalli, Vattolam

Distribution : India to Indo-China

Climbing shrubs. Leaves opposite, ovate, glabrous with a few small black glandular papillae at base. Racemes. Flowers many together. Sepals small, ovate to orbicular, ciliate. Corolla greenish-yellow with brown dots, lobes ovate. Outer corona lobes orbicular, emarginate, membranous; inner corona similar to outer.

Flowering & Fruiting : April-June

Notes : It is a Medicinal plant

67.*Cynanchum callialatum* Ham. ex Wight, Contrib. Bot. Ind. 56. 1834 & Ic. t. 1274. 1848; Hook. f., Fl. Brit. India 4: 24. 1883; Gamble, Fl. Pres. Madras 836(588). 1923; E. Vajr., Fl. Palghat Dist. 288. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 289. 2004. **Apocynaceae** (APG).

Distribution : India and Myanmar

Twiners. Leaves opposite, elliptic-oblong or linear-oblong. Cymes umbellate, axillary. Flowers small. Calyx 5-partite. Corolla white, divided nearly to the base, lobes oblong, acute. Corona of 5 erect obtuse, bifid lobes, with shorter lobes between them. Pollinia waxy, without pellucid margins. Style conical at apex.

Flowering & Fruiting : October-March

Herbarium:Coll.No.185.NKN/NMR/CTR/PKD,19.02.2022,PraveenkumarK.(Fl)

68.*Toxocarpus kleinii* Wight & Arn. in Wight, Contrib. Bot. Ind. 61.1834; Hook. f., Fl. Brit. India 4: 14.1883; Gamble, Fl. Pres. Madras 830(584). 1923; E. Vajr., Fl. Palghat Dist. 292. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 292. 2004. **Apocynaceae**(APG).

Distribution : Peninsular India and Sri Lanka

Twining subshrubs. Leaves simple, opposite-decussate, puberulous below. Cymes dichasial, lax, Cream coloured flowers. Follicles paired, elongate, fusiform; seeds oblong; coma silky.

Flowering & Fruiting : July

69.*Vincetoxicum indicum* (Burm.f.) Mabb., Mabberley's Pl.-Book 1102. 2017 var. indicum.*Cynanchum indicum* Burm. f., Fl. Ind. 70. 1768.*Tylophora indica* (Burm. f.) Merr., Philipp. J. Sci. 19: 373. 1921, var. indica; E. Vajr., Fl. Palghat Dist. 292. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 293. 2004.*Tylophora asthmatica* (L. f.) Wight & Arn. in Wight, Contrib. Bot. Ind. 51. 1834; Hook. f., Fl. Brit. India 4: 44. 1883; Gamble, Fl. Pres. Madras 843(593). 1923.*Asclepias asthmatica* L. f., Suppl. Pl. 171. 1781.*Asclepias prolifera* Rottl. ex Ainslie, Mat. Ind. 2: 225. 1826. **Apocynaceae**(APG).

Malayalam Name : Vallippala

Distribution : Indo-Malesia

Slender, pubescent climbers. Leaves opposite, , ovate to oblong, slightly pubescent on both sides. Flowers greenish-purple or greenish-yellow. Follicles oblong, tapering towards the apex, glabrous; seeds broadly ovate.

Flowering & Fruiting : February-July

Notes : It is a Medicinal plant.

70.*Wattakaka volubilis* (L. f.) Stapf, Bot. Mag. 148: sub t. 8976. 1923; E. Vajr., Fl. Palghat Dist. 293. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 294. 2004.*Asclepias volubilis* L. f., Suppl. Pl. 170. 1781.*Marsdenia volubilis* (L. f.) Cooke, Fl. Pres. Bombay 2: 166. 1904; Gamble, Fl. Pres. Madras 846(595). 1923.*Dragea volubilis* (L. f.) Benth. ex Hook. f., Fl. Brit. India 4: 46. 1883. **Apocynaceae** (APG).

Malayalam Name : Vattakakkakkoti, Kakkalankodi

Distribution : Indo-Malesia and China

Twining subshrubs. Leaves opposite, ovate, glabrous. Umbels axillary, drooping; pedicels puberulous. Flowers greenish-yellow. Follicles ribbed, blunt at apex; seeds ovate, compressed.

Flowering & Fruiting : March-July

Notes : It is a Medicinal plant

XII. ASTERACEAE

71.*Acanthospermum hispidum* DC., Prodr. 5: 522. 1836; Gamble, Fl. Pres. Madras 704(495). 1921; E. Vajr., Fl. Palghat Dist. 247. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 238. 2004.

Distribution : Pantropical

Malayalam Name : Njeringil, Musumusu

Erect densely hispid herbs. Leaves simple, opposite, ovate. Heads long, axillary, sessile; receptacle paleate. Outer row of flowers female, ligulate, yellow, three lobed at apex. Inner flowers bisexual; corolla long, tubular, five toothed at apex, yellow. Achenes, obovate, with two diverging long spines at apex, compressed; pappus absent.

Flowering & Fruiting : January-June

Notes : It is a Medicinal, an Exotic and a Weed plant

Herbarium:Coll.No.82.EKT/TCK/MKD/PKD,25.12.2020.,Praveenkumar K.(Fl).

72.*Acmella calva* (DC.) R.K. Jansen, Syst. Bot. Monogr. 8: 41. 1985; Sunil, Fl. Pl. Diver. Ernakulam Dist. 213. 2016. *Spilanthes calva* DC. in Wight, Contrib. Bot. 19. 1834; Sivar. & Remesan, J. Econ. Tax. Bot. 10: 143. 1987; E. Vajr., Fl. Palghat Dist. 256. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 254. 2004.

Malayalam Name : Akravu, Eripacha, Erivalli, Kaduparni

Distribution : Indo-Malesia and China

Procumbent scabrid herbs. Leaves simple, opposite, ovate, base truncate, apex acute, chartaceous. Heads, solitary, conical. Flowers bisexual. Corolla yellow,

long, tubular, campanulate above; lobes ovate, acute, glabrous. Achenes, obovate, biconvex, dark brown, glandular.

Flowering & Fruiting : February-April

Notes : It is a Medicinal and an Exotic plant

Herbarium:Coll.No.140.ATK/TCK/MKD/PKD,29.05.2021.,PraveenkumarK.(Fl)

73.*Ageratum conyzoides* L., Sp. Pl. 839. 1753; C.B. Clarke, Comp. Ind. 30. 1876; Hook. f., Fl. Brit. India 3: 243. 1881; Gamble, Fl. Pres. Madras 677(476). 1921; E. Vajr., Fl. Palghat Dist. 248. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 239. 2004. (Plate 13 A).

Malayalam Name : Aappa, Kaattappa, Murianpacha.

Distribution : Native of Mexico, naturalised in the tropical and subtropical regions

Herbs, viscid hairy. Leaves simple, opposite, ovate. Heads white, in terminal corymbose panicle. Flowers all similar, bisexual. Corolla tubular, white, glabrous, 5-lobed at apex. Stamens 5, anthers linear. Achenes linear, hirsute along the angles; pappus long, many, setaceous.

Flowering & Fruiting : August-December

Notes : It is a Medicinal, an Exotic and a Weed plant. The leaves are mixed with those of Allophyllus serratus and pounded. The paste mixed with egg albumin is locally applied for relief from muscular pains

Herbarium:Coll.No.52.NTK/PKY/ALT/PKD,30.05.2020., Praveenkumar K.(Fl).

74.*Blumea belangeriana* DC., Prodr. 5: 444. 1836; Hook. f., Fl. Brit. India 3: 266. 1881; Gamble, Fl. Pres. Madras 686(482). 1921; E. Vajr., Fl. Palghat Dist. 249. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 242. 2004.

Malayalam Nam : Venappacha

Distribution : India and Sri Lanka

Annual herbs. Leaves Alternate, sessile, elliptic or obovate. Heads in dense terminal and axillary corymbose panicles, sessile. Involucral bracts 4-seriate;

outer lanceolate-ovate, hairy; central florets tubular, bisexual, yellow, Achenes terete, oblanceolate, brown, hairy, 8-ribbe; pappus white, uniseriate.

Flowering & Fruiting : November-April

Notes : It is a Medicinal plant

75.*Blumea lacera* (Burm. f.) DC. in Wight, Contrib. Bot. Ind. 14. 1834; Hook. f., Fl. Brit. India 3: 263. 1881; Gamble, Fl. Pres. Madras 687(483). 1921; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 243. 2004.*Conyza lacera* Burm. f., Fl. Ind. t. 59. 1768. *Blumea subcapitata* DC., Prodr. 5: 439.1836.*Blumea lacera* (Burm. f.) DC. var. *cinerascens* Hook. f., Fl. Brit. India 3: 263. 1881.*Blumea lacera* (Burm. f.) DC. var. *glandulosa* (DC.) Hook. f., Fl. Brit. India 3: 263. 1881; Gamble, Fl. Pres. Madras 687(483). 1921.*Blumea glandulosa* DC. in Wight, Contrib. Bot. Ind. 14. 1834.

Malayalam Name : Kukkura-chedi, Rakkila

Distribution : Paleotropics

Annual herbs; stems terete, glabrous. Leaves simple, Alternate, broadly elliptic, to acute at both ends; irregularly toothed. Heads globose, terminal and upper axillary. Involucral bracts hairy at apex, inner oblong, acute, outer smaller. Bisexual flowers few; corolla glandular, of female flowers slender. Achenes smooth.

Flowering & Fruiting : Throughout the year

76.*Blumea laevis* (Lour.) Merr., Trans. Amer. Philos. Soc. n.s. 24: 386. 1935.Placus laevis Lour., Fl. Cochich. 497. 1790.*Blumea virens* Wall. ex DC. in Wight, Contrib. Bot. Ind. 14. 1834; Hook. f., Fl. Brit. India 3: 264. 1881; Gamble, Fl. Pres. Madras 686(483). 1921.

Distribution : Indo-Malesia

Erect glabrous shrubs. Leaves Alternate, pinnatisect and serrate, glabrous. Heads many, in axillary and terminal large panicles. Outer involucral bracts lanceolate, hairy at apex; inner larger, linear-oblong. Bisexual florets 10, central; corolla glandular. Female florets many; corolla slender. Achenes ribbed, oblong, hairy; pappus white.

Flowering & Fruiting : December-June

Notes : It is a Weed plant

77.*Blumea oxyodonta* DC. in Wight, Contrib. Bot. Ind. 15.1834; Hook. f., Fl. Brit. India 3: 266. 1881; Gamble, Fl. Pres. Madras 686(482). 1921 Sasidh., Fl. Parambikulam WLS 167. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 244. 2004.

Distribution : Indo-Malesia and South China

Prostrate herbs. Radical leaves simple, oblanceolate. Heads few, globose, in terminal panicles; bracts densely tomentose; outer lanceolate; inner linear. Female flowers yellow, many; corolla lobes glandular hairy. Bisexual flowers few; corolla broad. Achenes ribbed, pubescent.

Flowering & Fruiting : October-May

78.*Chromolaena odorata* (L.) King & Robins., Phytologia 20: 204. 1970; E. Vajr., Fl. Palghat Dist. 250. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 244. 2004.*Eupatorium odoratum* L., Syst. Nat. (ed. 10) 1205. 1759; Hook. f., Fl. Brit. India 3: 244. 1881. (Plate 13 B).

Malayalam Name : Assam pacha, Communist-pacha

Distribution : Native of tropical and subtropical America; naturalised in Tropical Asia and Africa

Shrubs. Leaves simple, opposite, ovate. Heads in terminal corymbose cymes. Involucral bracts ovate, obtuse; outer smaller, inner linear, acute. Flowers few to many, similar, bisexual; corolla white, tubular, pubescent at apex. Achenes linear, 5-angled, scabrous, black; pappus many, setaceous, yellowish.

Flowering & Fruiting : November-May

Notes : It is a Medicinal, an Exotic and a Weed plant. Leaf paste is applied to fresh wound for healing

Herbarium:Coll.No.186.PPN/VDR/CTR/PKD,19.02.2022.,PraveenkumarK.(Fl).

79.*Cyanthillium cinerum* (DC.) H.Rob., Proc. Biol. Soc. Wash. 103 252 1990; *Vernonia cinerea* (L.) Less., Linnaea 4: 291. 1829; Hook. f., Fl. Brit. India 3: 233.

1881; Gamble, Fl. Pres. Madras 676(475). 1921; E. Vajr., Fl. Palghat Dist. 257. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 257. 2004.*Conyza cinerea* L., Sp. Pl. 862. 1753. (Plate 4 G).

Malayalam Name : Puvankurunala

Distribution : Pantropics

Annual or perennial herbs, stem ribbed. Leaves variable, ovate, acute at both ends, thinly hairy below. Heads in terminal corymbose cymes, peduncled; outer bracts minute, inner oblong, acute, cuspidate, hairy. Flowers; corolla glabrous, bluish-purple. Achenes hairy.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant, Leaf juice mixed with honey is given for Malaria

Herbarium:Coll.No.166.KMN/ECY/CTR/PKD,25.12.2021.,PraveenkumarK.(Fl)

80.*Eclipta prostrata* (L.) L., Mant. Pl. 2: 286. 1771; Sasidh., Fl. Parambikulam WLS 169. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 247. 2004.*Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528. 1848; Hook. f., Fl. Brit. India 3: 304. 1881; Gamble, Fl. Pres. Madras 705(496). 1921; E. Vajr., Fl. Palghat Dist. 252. 1990.*Verbesina alba* L., Sp. Pl. 902. 1753.*Eclipta prostrata* (L.) L. var. dixitii Anand Kumar & Khanna, J. Econ. Tax. Bot. 23: 713. 1999.

Malayalam Name : Kaithonni, Kaiyan-takara, Kanjunni, Kayyunni

Distribution :Temp. & Subtropical America, naturalised in paleotropics from Africa to Australia

Herbs. Leaves simple, opposite, oblong, oblong-lanceolate or oblong-elliptic, entire, densely strigose. Involucral bracts in 2 rows; outer bracts 5, ovate-elliptic, subacuminate at apex. Ray florets 2-3- seriate, female; sepals minute, ovate, acute, membranous; corolla; tube; obtuse-tipped lobes at apex. Disk florets numerous, corolla campanulate. Achenes 90-120 per head, black to brown with white margins.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant

81.*Elephantopus scaber* L., Sp. Pl. 814. 1753; Hook. f., Fl. Brit. India 3: 242. 1881; Gamble, Fl. Pres. Madras 676(476). 1921; E. Vajr., Fl. Palghat Dist. 252. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 247. 2004.

Malayalam Name : Aanayadi, Aanachuvadi, Aanayadiyan,

Distribution :Tropical & Subtropical regions of Old World; naturalised in Australia

Herbs. Leaves radical, rosetted at base, obovate to oblong or oblanceolate. Heads, homogamous, non-rayed, sessile, aggregated in dense, stalked glomerules, substened by 3 ovate, reduced leaves. Involucral bracts 2-seriate, scarious. Flowers 2-5, bisexual. Corolla purple or white, lobes 5. Stamens 5, auricled at base. Ovary oblong; style arms subulate. Achenes 10-ribbed; pappus of 4-6 spiny bristles.

Flowering & Fruiting : October-January

Notes : It is a Medicinal plant

Herbarium:Coll.No.09.MNK/CVA/OTP/PKD,19.01.2020,Praveenkumar K.(Fl).

82.*Eleutheranthera ruderalis* (Sw.) Sch.-Bip., Bot. Zeit. 24: 165. 1866; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 247. 2004.*Melampodium ruderale* Sw., Fl. Ind. Occ. 3: 1372. 1806**.**

Distribution : Native of Tropical America; now established in several Asian countries

Annual herbs. Leaves opposite, ovate or ovate-oblong, pubescent on both surfaces. Heads 6-12-flowered, axillary, homogamous, non-rayed; peduncle erect at first, becomes curved in fruit. Involucral bracts in 2 series, outer leafy. Flowers bisexual. Corolla yellow, tubular, 5-lobed. Anthers sagittate at base. Achenes obovoid, slightly angled, tubercled, finely pubescent.

Flowering & Fruiting : May-November

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.136.AKV/NSY/PTB/PKD,22.05.2021.,Praveenkumar K.(Fl).

83.*Emilia scabra* DC., Prodr. 6: 303. 1838; Gamble, Fl. Pres. Madras 716(503). 1921; Sasidh., Fl. Parambikulam WLS 169. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 248. 2004.*Emilia sonchifolia* (L.) DC. var. *scabra* (DC.) Hook. f., Fl. Brit. India 3: 336. 1881. (Plate 10 B).

Malayalam Name : Poosha-thala

Distribution : India (Endemic)

Herbs, decumbent at base, crisped-pubescent. Leaves usually basal, few are cauline, oblong, entire or lyrate, crenate, base auricled, crispately pubescent. Heads few. Involucral bracts oblong, herbaceous, acute, glabrous. Flowers many; corolla glandular, pink, lobes acute. Achenes ribbed, hispid along the angles.

Flowering & Fruiting : September-November

Notes : It is a Medicinal plant.

84.*Emilia sonchifolia* (L.) DC. in Wight, Contrib. Bot. Ind. 24.1834; Hook. f., Fl. Brit. India 3: 336. 1881; Gamble, Fl. Pres. Madras 716(503). 1921; E. Vajr., Fl. Palghat Dist. 252. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 248. 2004.*Cacalia sonchifolia* L., Sp. Pl. 835. 1753.*Emilia javanica* (Burm. f.) Robs., Philip. J. Sci. 3: 217. 1908; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 247. 2004.*Hieracium javanicum* Burm. f., Fl. Ind. 174. t. 57. f. 1768.*Emilia sagittata* (Vahl) DC., Prodr. 6: 302. 1838. *Emilia flammea* Cass., Dict. Sci. Nat. 14: 406. t. 5. 1819; Hook. f., Fl. Brit. India 3: 336. 1881; Gamble, Fl. Pres. Madras 716(503). 1921. (Plate 4 H).

Malayalam Name : Elichevianveru, Muyalchevian, Orichozhiyan

Distribution : Tropical and Subtropical Africa and Asia; naturalised in some parts of Tropical America and Australia

Erect or diffuse herbs. Leaves radical and cauline; radical leaves lyrate-pinnatifid with large terminal lobes. Heads homogamous, not rayed. Involucral bracts cylindric, uniseriate, oblong-lanceolate. Florets bisexual. Corolla pink,

wider to the mouth, lobes 5. Stamens 5; anthers. Ovary; style-arms acute. Achenes, 5-ribbed, hispid; pappus white silky.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant

Herbarium:Coll.No.176.VTK/KTP/OTP/PKD,18.01.2022.,Praveenkumar K.(Fl).

85.*Mikania micrantha* Kunth, Nov. Gen. Sp. 4: 134. 1820; Sasidh., Fl. Parambikulam WLS 171. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 251. 2004.*Mikania scandens* C.B.Clarke, Comp. Ind. 34. 1876, non L.; Hook. f., Fl. Brit. India 3: 144. 1881. *Mikania cordata* (Burm. f.) Robins., Contrib. Gray Herb. 104: 65.1934. (Plate 13 D).

Malayalam Name : Dhritarashtra-pachha, Mikenia, Vayara

Distribution : Pantropical

Climbers. Leaves simple, opposite, ovate, crenate, glabrate. Heads in axillary panicles. Involucral bracts biseriate, outer 2 smaller, ovate, obtuse. Flowers 3-5, similar, bisexual; corolla tubular, lobes 5, glandular, white; anthers linear. Achenes 5-ribbed, black, glabrous; pappus many, hispid.

Flowering & Fruiting : February-April

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.212.MVK/PTR/PTB/PKD,20.12.2022.,Praveenkumar K.(Fl).

86.*Pentanema indicum* (L.) Ling, Acta Phyt. Sin. 10: 179. 1965; E. Vajr., Fl. Palghat Dist. 258. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 252. 2004.*Inula indica* L., Sp. Pl. (ed. 2) 1236. 1763.*Vicoa auriculata* Cass., Ann. Sci. Nat. Bot. ser. 1, 17: 418. 1829; Hook. f., Fl. Brit. India 3: 297. 1881.Vicoa indica (L.) DC. in Wight, Contrib. Bot. Ind. 10. 1834; Gamble, Fl. Pres. Madras 701(493). 1921.

Malayalam Name : Kammalchedi

Distribution : India, China, Thailand and West Africa

Annual herbs. Leaves simple, Alternate, elliptic ovate. Heads in terminal and axillary corymbs. Involucre bracts many-seriate; outer ones leafy, shorter,

moniliform hairy without, mucronate at tip; inner ones scarious at base, leafy above. Flowers homogamous, not rayed. Corolla campanulate, purple; tube slender, widened at mouth; style-arms subulate, hairy at tip. Achenes; pappus yellow, barbellate hairs.

Flowering & Fruiting : November-February

87.*Sphagneticola calendulacea* (L.) Pruski, Novon 6(4): 411. 1996.*Wedelia chinensis* (Osbeck) Merr., Philipp., J. Sci. 12: 111. 1917; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 260. 2004.*Solidago chinensis* Osbeck, Dagbock Ostind. Resa 241. 1757.*Wedelia calendulacea* (L.) Less., Syn. 222. 1832; Hook. f., Fl. Brit. India 3: 306. 1881; Gamble, Fl. Pres. Madras 707(497). 1921.*Verbesina calendulacea* L., Sp. Pl. (ed. 2) 1272. 1763.

Malayalam Name : Aswagandhi, Manjakanjunni, Kadal-kayyonni

Distribution : Indo-Malesia

Procumbent or ascending herbs. Leaves spathulate-oblanceolate, acute, trinerved. Heads yellow, solitary on terminal peduncles. Involucral bracts in 2 series. Achenes dark brown, rugulose, glabrous. Pappus a minute, irregularly margined, withered cup at maturity.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant

88.*Synedrella nodiflora* (L.) Gaertn., Fruct. 2: 456. t. 171. 1791; Hook. f., Fl. Brit. India 3: 308. 1881; Gamble, Fl. Pres. Madras 708(498). 1921; E. Vajr., Fl. Palghat Dist. 256. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 255. 2004.*Verbesina nodiflora* L., Cent. Pl. 1: 28. 1755 & Ameon. Acad. 4: 290. 1759.

Malayalam Name : Mudianpacha, Mudundrapacha, Mudiyendrapacha

Distribution : Native of Tropical & Subtropical America; naturalised in Tropical and subtropical Africa, Asia to Australia

Erect branches herbs; stem adpressed hairy. Leaves simple, opposite, elliptic-ovate. Heads solitary, axillary and terminal, few-flowered, radiate. Involucre bracts 2-seriate. Flowers heterogamous, yellow. Achenes dimorphic: of ray

florets dorsally compressed, with lacerate wings; of disk florets trigonous, not winged, with 2 or 3 rigid awns.

Flowering & Fruiting : Throughout the year

Notes **:** It is an Exotic and a Weed plant.

89.*Tarlmounia elliptica* (DC.) H. Rob., S.C. Keeley, Skvarla & R. Chan, Proc. Biol. Soc. Washington 121(1): 32. 2008.*Vernonia elliptica* DC. in Wight, Contrib. Bot. Ind. 5. 1834; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 258. 2004.*Vernonia elaeagnifolia* DC., Prodr. 5: 22. 1836.

Malayalam Name : Curtain-chedi

Distribution : India, Myanmar and Thailand

Shrubs, climbing. Leaves oblong or elliptic-lanceolate, shortly petioled. Heads aggregated in axillary or terminal corymbs. Involucral bracts scarious to herbaceous; outer ovate-obovate, pubescent without; inner obtuse, thinly ciliate on margins. Achenes glabrous, 5-8-ribbed; pappus hairs white; outer few.

Flowering & Fruiting : January-April

Notes : It is an Exotic and a Garden plant

Herbarium: Coll.No.37.CSS/SKP/OTP/PKD, 11.03.2020., Praveenkumar K.(Fl).

90.*Tridax procumbens* L., Sp. Pl. 900. 1753; Hook. f., Fl. Brit. India 3: 311. 1881; Gamble, Fl. Pres. Madras 711(500). 1921; E. Vajr., Fl. Palghat Dist. 256. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 256. 2004. (Plate 13 H).

Malayalam Name : Kumminnippacha, Muriyampachila,

Distribution : Native of Tropical America; now widespread throughout tropics and subtropics

Procumbent pubescent herbs. Leaves simple, opposite, ovate. Heads heterogamous, solitary, on long peduncles. Involucre bracts in 3-series, lanceolate, hairy. Outer row of flowers ligulate, female; limb 3-toothed, white. Inner flowers bisexual, tubular; corolla 5-lobed at apex, yellow. Achenes obovoid, densely hairy; pappus many, setaceous.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Weed plant Leaf juice is applied on wounds to stop bleeding and for healing.

Herbarium:Coll.No.218.KPS/ANR/MKD/PKD,28.12.2022,PraveenkumarK.(Fl).

XIII. BIGNONIACEAE

91.*Millingtonia hortensis* L. f., Suppl. Pl. 291. 1781; C.B. Clarke in Hook. f., Fl. Brit. India 4: 377. 1884; Gamble, Fl. Pres. Madras 994(699). 1924; E. Vajr., Fl. Palghat Dist. 336. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 334. 2004.*Bignonia suberosa* Roxb., Pl. Corom. t. 214. 1811 & Fl. Ind. 3: 111. 1832.

Malayalam Name : Akasaveppu, Maramalli, Kadesam

Distribution : South East Asia and Malesia

Trees; bark pale brown, corky. Leaves 2-3 pinnate, opposite; leaflets opposite, slender; petiolule slender, grooved above. Flowers white, in terminal corymbose panicles. Fruit an elongated capsule, 2-valved; seeds many, winged.

Flowering & Fruiting : August-May

Notes : It is an Exotic and a Garden plant. The branches of trees break during heavy wind. Therefore, don't plant in school premises. The bark is used to produce a yellow dye.

Herbarium:Coll.No.224.EPN/KVR/CTR/PKD,02.03.2023.,Praveenkumar K.(Fl).

92.*Oroxylum indicum* (L.) Benth. ex Kurz, For. Fl. Burma 2: 238. 1877; C.B. Clarke in Hook. f., Fl. Brit. India 4: 378. 1884; Gamble, Fl. Pres. Madras 994(698). 1924; E. Vajr., Fl. Palghat Dist. 335. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 334. 2004.*Bignonia indica* L., Sp. Pl. 625. 1753.

Malayalam Name : Palakapayyani, Payyazhantha, Valpathiri.

Distribution : South India and Sri Lanka

Medium sized trees. Leaves opposite; imparipinnate, opposite; leaflets 3-5 in each pinnae, opposite, ovate. Flowers bisexual, in lax terminal racemes, reddish-

purple outside, pinkish-yellow within, racemes. Fruit a capsule, compressed, tapering at both end; seeds thin, papery, winged all around except at base.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant. The root is one of the dashamoola of Ayurveda. Bark is used in tanning and dyeing.

93.*Spathodea campanulata* P.Beauv., Fl. Owar. 1: 47. tt. 27-28. 1805; Gamble, Fl. Pres. Madras 1000(703). 1924; Sasidh., Fl. Parambikulam WLS 224. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 335. 2004.

Malayalam Name : Thaneerkaimaram, Spathodia

Distribution : Native in Tropical Africa

Trees; bark smooth, light brownish-grey. Leaves opposite, decussate. Flowers bright red, in terminal racemes. Calyx spathaceous, yellowish-brown velutinous, recurved. Corolla tube reddish-orange, yellowish within, glandular; lobes 5, subequal. Fruit a capsule, lanceolate-oblong, brownish-black, woody; seeds many, winged.

Flowering & Fruiting : November-May

Notes : It is an Exotic and a Garden plant

94.*Tecoma stans* (L.) Kunth, Nov. Gen. Sp. 3: 144. 1819; E. Vajr., Fl. Palghat Dist. 336. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 335. 2004.*Bignonia stans* L., Sp. Pl. (ed. 2) 871. 1763.*Stenolobium stans* (L.) D. Don, Edinb. Philos. J. 9: 264. 1823; Gamble, Fl. Pres. Madras 1000(703). 1924. (Plate 16 H).

Malayalam Name : Manja arali

Distribution : Native of South America and the Caribbean Islands. Grown as garden and avenue tree throughout the tropical and sub-tropical worl

Large shrub to small trees, glabrous. Leaves opposite, pinnate; leaflets elliptic to elliptic-ovate. Flowers in short terminal panicles, bright yellow. Capsule linear capsule; seeds orbicular-compressed.

Flowering & Fruiting : December-April

Notes : It is an Exotic and a Garden plant

Herbarium:Coll.No.137.CSK/KSY/PKD/PKD,22.05.2021.,Praveenkumar K.(Fl).

XIV. BIXACEAE

95.*Bixa orellana* L., Sp. Pl. 512. 1753; Hook. f., Fl. Brit. India 1: 252. 1827; Dunn in Gamble, Fl. Pres. Madras 51(36). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 30. 2004. (Plate 14 D).

Malayalam Name : Kunkumam, Kurangumanjal, Sindooram

Distribution : Originally from Tropical America; now widespread in the tropics

Shrubs or small evergreen trees. Leaves simple, Alternate, ovate, subcordate or truncate at base. Inflorescence a terminal corymb or panicle, 8-50 flowered, scaly. Petals 5-7, unequal, obovate, rounded at apex, pink or white. Capsules globose or broadly ovoid, nearly truncate at base; seeds obpyramidal, the orange-red sarcotesta contains the pigment bixin.

Flowering & Fruiting : June-November

Notes : It is a Medicinal and an Exotic plant. Leaves are ground and made into a paste and applied on the site of the snake bite.

Herbarium:Coll.No.223.PTK/KSY/PKD/PKD,30.02.2023.,Praveenkumar K.(Fl).

XV. BOMBACACEAE

96.*Bombax ceiba* L., Sp. Pl. 511. 1753; Nicolson, Taxon 28: 370. 1979; E. Vajr., Fl. Palghat Dist. 86. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 55. 2004.*Bombax malabaricum* DC., Prodr. 1: 479. 1824; Mast. in Hook. f., Fl. Brit. India 1: 349. 1874; Dunn. in Gamble, Fl. Pres. Madras 99(71). 1915.*Salmalia malabarica* (DC.) Schott & Endl., Melet. Bot. 35. 1832. **Malvaceae** (APG). (Plate 3 B).

Malayalam Name : Elavu, Mullilavu, Pichila, Poola,

Distribution : Tropical Asia and New Guinea

Deciduous trees. Leaves Alternate, digitately-compound; leaflets whorled; elliptic, elliptic-ovate or elliptic-obovate,. Flowers bisexual, dark crimson. Petals

5, obovate to elliptic-obovate, recurved, fleshy, tomentellous outside, imbricate. Fruit a capsule; seeds numerous, pyriform, smooth, dark brown, embedded in white cotton.

Flowering & Fruiting : January-April

Notes : It is a Medicinal plant. The gum is useful in influenza, burning sensation, bleeding piles and blood impurities. The wood is used for making pencil, plywood and match boxes.

97.*Ceiba pentandra* (L.) Gaertn., Fruct. 2: 244,t.133. 1791; E. Vajr., Fl. Palghat Dist. 87. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 55. 2004.*Bombax pentandrum* L., Sp. Pl. 511. 1753.*Eriodendron anfractuosum* DC., Prodr. 1: 479. 1824; Mast. in Hook. f., Fl. Brit. India 1: 350. 1874.*Eriodendron pentandrum* (L.) Kurz, J. Asiat. Soc. Bengal, Pt. 2. Nat. Hist. 43: 113. 1874; Dunn. in Gamble, Fl. Pres. Madras 100(72). 1915.Ceiba pentandra (L.) Gaertn. var. indica (DC.) Bakh. f., Bull. Jard. Bot. Buitenz. ser.3, 6: 195. 1924. **Malvaceae** (APG).

Malayalam Name : Dayna, Kapok, Panjimaram, Poola

Distribution : Native of tropical America

Trees. Leaves digitately compound, Alternate, gathered towards the apex of branchlets; leaflets 5-9, elliptic, obovate-oblong or ovate-oblong. Flowers bisexual, creamy white. Fruit a capsule 7ellipsoid to fusiform, green when young, become brown, narrowed at both ends, indehiscent or tardily dehiscing into 5 valves, septa membranous; seeds numerous.

Flowering & Fruiting : February-June

Notes : It is an Exotic plant. The floss is used for stuffing pillows, cushions, mattress etc.

XVI. BORAGINACEAE

98.*Cordia wallichii* G. Don, Gen. Hist. 4: 379. 1837-1838; Gamble, Fl. Pres. Madras 887(623). 1923; E. Vajr., Fl. Palghat Dist. 302. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 302. 2004.*Cordia obliqua* Willd. var. wallichii (G. Don) C.B. Clarke

in Hook. f., Fl. Brit. India 4: 137. 1883.*Cordia obliqua* Willd. var. tomentosa Kazmi, J. Arnold. Arbor. 51. 143. 1970. (Plate 9 F).

Malayalam Name : Cheruthekku, Kokkamani, Periyaviri, Virimaram

Distribution : Peninsular India (Endemic)

Deciduous trees. Leaves simple, Alternate, ovate or orbicular. Flowers polygamous, creamy white in lax terminal corymbose cymes. Fruit a drupe, depressed-globose, yellow, shining. Ripe fruits eaten.

Flowering & Fruiting : December-May.

99.*Ehretia microphylla* Lam., Illustr. 1: 425. 1792; Gamble, Fl. Pres. Madras 891(626). 1923. *Carmona microphylla* (Lam.) G. Don, Gen. Hist. 4: 391. 1837-1838.*Ehretia buxifolia* Roxb., Pl. Corom. t. 57. 1796; C.B. Clarke in Hook. f., Fl. Brit. India 4: 144. 1883.*Carmona retusa* (Vahl) Masamune, Trans. Nat. Hist. Soc. Taiwan 30: 61. 1940; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 301. 2004.*Cordia retusa* Vahl, Symb. Bot. 2: 42. 1791.

Malayalam Name : Koorachiyila, Kuranguvettila

Distribution : Indo-Malesia

Shrubs. Leaves mostly fascicled on short, spur-like branches, occasionally Alternate, often small, spathulate. Flowers subsessile. Sepals 5, slightly connate basally, spathulate. Corolla salverform, white, tube shallow, 5-lobed. Stamens exserted. Ovary globose; the style slender, cleft below the middle; stigmas scarcely differentiated. Fruit drupaceous, globose, 4-seeded, not separating at maturity.

Flowering & Fruiting : November-December

Notes : It is a Medicinal plant

100.*Heliotropium indicum* *L.*, Sp. Pl. 130. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 152. 1883; Gamble, Fl. Pres. Madras 896(630). 1923; E. Vajr., Fl. Palghat Dist. 303. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 303. 2004.

Malayalam Name : Thelkada, Therkkada, Thekkida

Distribution : Pantropical

Erect, branched, pubescent herbs. Leaves simple, opposite, sub-deltoid or broadly ovate, chartaceous. Flowers sessile, in terminal or leaf-opposed curved, long spikes. Corolla pale violet or pink, salver-form; slightly constricted distally, 5-lobed; ovate. Ovary weakly 4 -lobed; stigma conical. Nutlets connate in pairs, separating later, ribbed.

Flowering & Fruiting : September-March

Notes : It is a Medicinal and a Weed plant.

XVII. BROMELIACEAE

101.*Ananas comosus* var. *bracteatus* (Lindl.) Coppens & F. Leal, Pineapple: Bot., Prod. & Uses 28. 2002.*Ananas bracteatus* (Lindl.) Schult. & Schult. f., Syst. Veg. 7: 1286. 1830.*Ananassa bracteata* Lindl., Edwards's Bot. Reg. 23: t. 1968. 1837.*Ananas bracteatus* var. *striatus* M.B. Foster, Bull. Bromeliad Soc. 8: 97. 1959.

Malayalam Name : Cherukadachi

Distribution : Native of South America

Acaulescent perennial shrubs. Leaves many, simple, linear, arching, caudate-attenuate, acuminate, edges with sharp spines. Scape solitary. Flowers small, violet-purple; bracts imbricate, spiny, red or pink. The fruit is a small to medium, syncarp.

Flowering & Fruiting : Throughout the year

XVIII. BURSERACEAE

102.*Garuga pinnata* Roxb., Pl. Corom. t. 208. 1811; Bennett in Hook. f., Fl. Brit. India 1: 528. 1875; Gamble, Fl. Pres. Madras 172(121). 1915; E. Vajr., Fl. Palghat Dist. 107. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 86. 2004.

Malayalam Name : Annakkara, Eechakkara, Karuvembu, Kareyam,

Distribution : Indo-Malesia

Deciduous trees. Leaves imparipinnate, Alternate, crowded at the tips of branchlets. Flowers polygamous, yellow in axillary panicles. Disc crenate,

yellow. Fruit a drupe, greenish-yellow, oblong or irregularly globose; pyrenes 2 or 3; seed one, with a membranous wing.

Flowering & Fruiting : January-August

Notes : It is a Medicinal plant.

XIX. CACTACEAE

103.*Cereus pterogonus* Lam., Cact. Gen. 59.1839; E.Vajr., Fl. Palghat Dist. 219. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 201. 2004**.**

Malayalam Name : Poochamullu

Distribution : Pantropical

Shrub. Leaves 0. Flowers lateral, sessile. Perianth tube terete at base, funnel-shaped with a few scales below. Ovary subterete-angular with scales and areoles; ovules numerous, on several parietal placentae.

Flowering & Fruiting : April-June

Notes : It is an Exotic plant.

XX. CAESALPINIACEAE

104.*Bauhinia acuminata* L., Sp. Pl. 376. 1753; Baker in Hook.f., Fl. Brit. India 2: 276. 1878; Gamble, Fl. Pres. Madras 408(289). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 151. 2004. (Plate 16 B).

Malayalam Name : Veluthamandharam, Mandharam

Distribution : Indo-Malesia

Large shrubs. Leaves Alternate, ovate to subrotund. Inflorescences lateral, few-flowered, racemose or cymes. Petals white, elliptic, obtuse. Pod linear-oblong, margins sharp-rimmed, raised, somewhat septate within; seeds compressed, brown.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant

105.*Bauhinia purpurea* L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 284. 1878; Gamble, Fl. Pres. Madras 407(288). 1919; E.Vajr., Fl. Palghat Dist. 179. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 151. 2004.*Phanera purpurea* (L.) Benth. in Miq., Pl. Jungh. 262. 1852.

Malayalam Name : Chuvannamandaram

Distribution : Native of South East Asia

Medium sized trees. Leaves alterernate, minutely pubescent below when young. Inflorescence few flowered panicles at the ends of the branches; tomentose. Petals oblanceolate, long clawed, spreading, veined, pink. Stamens usually 3 fertile. Ovary downy, long stalked; style long, stigma oblique. Pod orbicular, brown, smooth.

Flowering & Fruiting : September-December

Notes : It is an Exotic and a Garden plant

106.*Bauhinia tomentosa* L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 275. 1878; Gamble, Fl. Pres. Madras 4063(288). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 151. 2004.

Malayalam Name : Manjamanaram, Kanchanapoovu.

Distribution : Native of South East Asia

Shrubs to small trees. Leaves Alterernate, bilobed, lobes rounded at apex. Flowers axillary in pairs, sometimes 1-3; bracteoles subulate persistent. Petals 5, obovate, not clawed, yellow, conspicuously veined, one with a red blotch on the inner surface. Pod dehiscent, stipe tomentose or glabrous; 6-10 seeded.

Flowering & Fruiting : September-May

Notes : It is a Medicinal, an Exotic and a Garden plant

Herbarium:Coll.No.142.KYS/KSY/PKD/PKD,12.06.2021.,Praveenkumar K.(Fl).

107.*Bauhinia variegata* L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 284. 1878; Gamble, Fl. Pres. Madras 407(288). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 152. 2004.*Phanera variegata* (L.) Benth. in Miq., Pl. Jungh. 261. 1852.

Malayalam Name : Chuvannamandaram, Malayakathi, Mandaram

Distribution : Possibly native of China; wild in the sub Himalayan and India

Medium sized trees. Leaves Alternate, as broad as or rather broader than long. Inflorescence a few flowered pubescent raceme. Petals obovate, with long rather broad claw, all white or 4 petals pale purple and fifth darker with purple veins. Pod hard, flat, dehiscent, stipe glabrous; 10-15 seeded.

Flowering & Fruiting : September-May

Notes : It is an Exotic and a Garden plant

Herbarium: Coll.No.03.EPN/KVR/CTR/PKD,12.01.2020, Praveenkumar K. (Fl).

108.*Biancaea sappan* (L.) Tod., Hort. Bot. Panorm. 1(1): 3. 1875.*Caesalpinia sappan* L., Sp. Pl. 381. 1753; Baker in Hook.f., Fl. Brit. India 2: 255. 1878; Gamble, Fl. Pres. Madras 394(279). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 153. 2004.

Malayalam Name : Chappangam, Patang, Sappannam

Distribution : Indo-Malesia

Trees. Leaves bipinnate, Alternate. Flowers bisexual, yellow, in supra-axillary and terminal racemes; sepals 5, unequal; petals 5, orbicular, subequal, with red spot at the base; stamens 10, declinate, densely woolly at base; ovary half inferior, grey-velvety. Fruit a pod, obliquely oblong, black, glabrous; seeds black, oblong or ellipsoid.

Flowering & Fruiting : August-December

Notes : It is a Medicinal and an Exotic plant. Wood is yields a dye. The decoction gives relief in mild cases of dysentery and diarrhea. Water boiled with wood is used for drinking.

109.*Caesalpinia pulcherrima* (L.) Swartz, Obs. 166.1791; Baker in Hook.f., Fl. Brit. India 2: 288.1878; Gamble, Fl. Pres. Madras 394(279). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 153. 2004.*Poinciana pulcherrima* L., Sp. Pl. 380. 1753.

Malayalam Name : Rajamalli, Settimandaram

Distribution :Probably native in Tropical America; now widely cultivated

Large shrubs to small trees. Leaves bipinnate. Flowers in terminal corymbose racemes; Calyx outer lobe cucullate, enclosing the flower bud. Petals subequal, commonly flame-red but sometimes pink and yellow. Pod obliquely oblong, compressed, short-stipitate, beaked at apex; seeds 8-10.obovate, compressed, black.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant.

110.*Cassia fistula* L., Sp. Pl. 377. 1753; Baker in Hook.f., Fl. Brit. India 2: 201. 1878; Gamble, Fl. Pres. Madras 400(283). 1919; E.Vajr., Fl. Palghat Dist. 181. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 153. 2004.*Cassia rhombifolia* Roxb., Fl. Ind. 3: 334. 1832. (Plate 3 C).

Malayalam Name : Kanikonna, Karnikaram.

Distribution : Indo-Malesia

Deciduous trees. Leaves paripinnate, Alternate; leaflets opposite, ovate, ovate-lanceolate or oblong-ovate. Flowers yellow, in axillary drooping racemes. Calyx lobes 5, ovate, apex obtuse, reflexed. Petals 5, obovate, subequal, clawed. Ovary appressed-pubescent; ovules many; stigma punctiform. Pod cylindrical, black, shortly stipitate, indehiscent.

Flowering & Fruiting : February-September

Notes : It is a Medicinal and a Garden plant. The flowers are prime choice for 'Vishukkani'. Young leaves or leaf extracts are given to children for the extraction of intestinal worms and fruit pulp is given for diabetes. Seeds have shown to posses hypoglycaemic activity. The roots are useful in skin diseases. Timber is hard and heavy, locally used for building construction. State flower of Kerala

Herbarium:Coll.No.118.CTV/KND/PKD/PKD,22.03.2021,PraveenkumarK.(Fl).

111.*Delonix regia* (Boj. ex Hook.) Rafin., Fl. Tell. 2: 92. 1836; Gamble, Fl. Pres. Madras 396(280). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 154. 2004.*Poinciana regia* Boj. ex Hook., Bot. Mag. t. 2884. 1829; Baker in Hook.f., Fl. Brit. India 2: 260. 1878. (Plate 15 A).

Malayalam Name : Poomaram

Distribution : Native of Madagascar; now cultivated throughout the tropics

Trees. Leaves bi-pinnate, Alternate; puberulent, with a sessile gland between each pinnae on upper side. Flowers bisexual, crimson, in terminal or lateral corymbose panicles. Petals 5, orbicular, imbricate; margins fimbriate, claws yellow, upper petal white streaked with red and yellow. Pod flat, elongate, woody; seeds many, oblong, transverse.

Flowering & Fruiting : February-July

Notes : It is an Exotic and a Garden plant

112.*Hultholia mimosoides* (Lam.) Gagnon & G.P. Lewis, PhytoKeys 71: 61. 2016.*Caesalpinia mimosoides* Lam., Encycl. 1: 452.1785; Baker in Hook.f., Fl. Brit. India 2: 256.1878; Gamble, Fl. Pres. Madras 394(279). 1919; Manilal, Fl. Silent Valley 90. 1988; Sasidh., Fl. Parambikulam WLS 106. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 153. 2004.

Malayalam Name : Chingamullu, Drathubanam.

Distribution : Indo-Malesia

Straggling shrubs with tuberous root stock, prickly all over. Leaves; pinnae; leaflets, oblong or elliptic. Flowers, bright yellow, in terminal and leaf-opposed racemes. Pod oblong-obovoid, turgid; seeds 2.

Flowering & Fruiting : January-March

Notes : It is a Medicinal plant. Paste of young shoots and onion used in the treatment of ulcer.

113.*Mezoneuron cucullatum* (Roxb.) Wight & Arn., Prodr. 283. 1834; Baker in Hook.f., Fl. Brit. India 2: 258. 1878; Gamble, Fl. Pres. Madras 395(279). 1919; E.Vajr., Fl. Palghat Dist. 182. 1990.*Caesalpinia cucullata* Roxb., Fl. Ind. 2: 358. 1832; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 152. 2004.

Malayalam Name : Kaka-kalingi-valli, Verimullu, Kalingavalli

Distribution : Indo-Malesia

Stout climbers; old stem covered with strong thorns with clavate thick base. Leaves paripinnate; pinnules 5 or 6 pairs; leaflets 3 pairs, ovate, acuminate, glabrous. Racemes clustered. Flowers yellow, irregular, cucullate. Sepals unequal, lobes obtuse, glabrous. Petals unequal, orbicular; filaments glabrate. Pod flattened, oblong, obtuse, glabrous.

Flowering & Fruiting : December-March.

114.*Saraca asoca* (Roxb.) de Wilde, Blumea 15: 393. 1968; E.Vajr., Fl. Palghat Dist. 184. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 156. 2004.*Jonesia asoca Roxb.*, Asiat. Res. 4: 365. 1799.*Saraca indica* sensu Bedd., Fl. Sylv. t. 57. 1870; Baker in Hook.f., Fl. Brit. India 2: 271. 1878; Gamble, Fl. Pres. Madras 409(289). 1919, non L. 1769. (Plate 8 D).

Malayalam Name : Ashokam, Hemapushpam, Vanjuulam

Distribution : India and Myanmar

Trees, surface brown or brownish-black. Leaves paripinnate, Alternate. Flowers yellow-orange or red, in dense sessile paniculate corymbs, axillary to leaves or leaf scars; bracts ovate, small deciduous; bracteoles oblong-spathulate, ciliolate, coloured, subpersistent.. Fruit a pod flat, oblong, coriaceous or almost woody, tapering at both ends; seeds 2-8, ovoid, slightly compressed.

Flowering & Fruiting : February-August

Notes : It is a Medicinal and a Garden plant. The bark is useful in controlling excessive or prolonged menstruation, uterine diseases, abnormal mucous discharge from the vagina and pimples. The leaf juice mixed with cumin seeds

is used for treating stomach pain. The flowers are considered to be a uterine tonic. The dried flowers are used in diabetes and haemorrhagic dysentery.

Herbarium:Coll.No.44.ASK/TCK/MKD/PKD,18.05.2020.,Praveenkumar K.(Fl).

115.*Senna hirsuta* (L.) H.S.I rwin & Barneby, Phytologia 44: 499. 1979; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 157. 2004.*Cassia hirsuta* L., Sp. Pl. 378. 1753; Baker in Hook.f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; E.Vajr.,Fl.Palghat Dist.181.1990.

Distribution : Native of Tropical America

Erect undershrub, densely hirsute all over. Leaves ovate or elliptic, linear-lanceolate. Flowers yellow, in axillary and terminal few-flowered racemes. Pod 10 linear, subterete, curved, densely hirsute; seeds many, orbicular, compressed, light brown.

Flowering & Fruiting : September-December

Notes : It is an Exotic and a Weed plant.

116.*Senna occidentalis* (L.) Link, Handb. 2: 140. 1831; V. Singh, Monogr. Indian Subtribe *Cassiinae* 170. 2001; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 157. 2004.*Cassia occidentalis* L., Sp. Pl. 377. 1753; Baker in Hook.f., Fl. Brit. India 2: 262. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; E.Vajr., Fl. Palghat Dist. 182. 1990.

Malayalam Name : Karinthakara, Mattanthakara, Nathramthakara.

Distribution : Native of South America; naturalised in Asia

Erect subshrubs. Leaves; leaflets 4-5 pairs, ovate-lanceolate, glabrous or pubescent. Flowers in terminal and axillary racemes; bracts linear-lanceolate. Pod 5, linear, compressed; seeds 20-25, ovate or suborbicular, compressed, brown.

Flowering & Fruiting : July-December

Notes : It is a Medicinal, an Exotic and a Weed plant.

117.*Senna tora* (L.) Roxb., Fl. Ind. 2: 340.1832; Sasidh., Fl. Parambikulam WLS 10. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 158. 2004.*Cassia tora* L., Sp. Pl. 376.

1753; Baker in Hook.f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; E.Vajr., Fl. Palghat Dist. 182. 1990.

Malayalam Name : Chakramandarakam, Thakara, Ponthakara

Distribution : Native of South America

Annual, glabrous subshrubs. Leaves obovate-oblong, pubescent below; stipules linear. Flowers in few-flowered axillary racemes. Pod linear, subtetragonous, septate between seeds, indehiscent; seeds 20-30, oblong, compressed, chestnut-brown.

Flowering & Fruiting : August-December

Notes : It is a Medicinal, an Exotic and a Weed plant. Tender leaves eaten as vegetable

Herbarium:Coll.No.65.KTK/TCK/MKD/PKD,19.11.2020.,Praveenkumar K.(Fl).

118.*Tamarindus indica* L., Sp. Pl. 34. 1753; Baker in Hook.f., Fl. Brit. India 2: 273. 1878; Gamble, Fl. Pres. Madras 409(290). 1919; E.Vajr., Fl. Palghat Dist. 184. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 158. 2004. (Plate 15 H).

Malayalam Name : Kolpuli, Puli, Valampuli

Distribution : Native of Tropical Africa; introduced and widely grown in India and other parts of tropics

Trees, bark brown to brownish-black, rough; branchlets tomentose. Leaves paripinnate, Alternate. Flowers yellow with reddish-pink dots, in lax terminal racemes. Pod oblong, fruit wall crustaceous, mesocarp pulpy, endocarp septate, leathery, indehiscent; seeds 3-8 or more, obovoid-orbicular, compressed, brown.

Flowering & Fruiting : September-April

Notes : It is a Medicinal and an Exotic plant, Drink prepared from ripe fruits taken for constipation.The fruit pulp is rich in tartaric and citric acids, high amount of vitamin C and sugar. The fruit pulp is used in syrup, juice concentrates and as a spice in drinks, chutney, curries, pickles and meat sauces.

The seeds are used as cattle feed. The wood is hard and strong, used as chopping blocks, also used as firewood.

XXI. CAPPARACEAE

119.*Capparis zeylanica* L., Sp. Pl. (ed.2) 720. 1762; Dunn in Gamble, Fl. Pres. Madras 46(33). 1915; Sundararagh. in B.D. Sharma & N.P. Balakr. (eds.), Fl. India 2: 298. 1993;; Sasidh., Fl. Parambikulam WLS 12. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 28. 2004.*Capparis horrida* L.f., Suppl. Pl. 264. 1781; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 178. 1872.

Malayalam Name : Elippayar, Gitoran, Karthotti

Distribution : Indo-Malesia and China

Scandent shrubs. Leaves pubescent. Flowers in supra axillary rows, white, buds densely pubescent. Fruit subglobose, obtusely 4-angled, red-brown, stalk thickened; seeds many.

Flowering & Fruiting : March-May

120.*Cleome rutidosperma* DC. var. *burmanni* (Wight & Arn.) Siddiqui & S.N. Dixit, Pl. Sci. (Lucknow) 6: 68 1974.*Cleome burmanni* Wight & Arn., Prodr. 22. 1834; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 170. 1872; Dunn in Gamble, Fl. Pres. Madras 41(29). 1915; Sasidh., Fl. Parambikulam WLS 13. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 28. 2004. **Cleomaceae** (APG).

Malayalam Name : Kattukadugu

Distribution : Indo-Malesia

Annual herbs. Leaves Alternate, 3 (5)-foliolate; leaflets subsessile, rhomboid-elliptic to lanceolate. Flowers solitary, axillary, pedicel elongates in fruit. Petals obovate, blue, pink or violet, narrowed into a basal claw. Capsule linear-ellipsoid, seeds many, reddish-brown or dark brown .

Flowering & Fruiting : February-August

Notes : It is a Weed plant

121.*Cleome viscosa* L., Sp. Pl. 672. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 170. 1872; Dunn in Gamble, Fl. Pres. Madras 41(29). 1915; E. Vajr., Fl. Palghat Dist. 57. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 29. 2004. **Cleomaceae** (APG).

Malayalam Name : Karimkadugu.

Distribution : Pantropical

Erect profusely branched annual herbs. Leaves Alternate, 3-5(-7)-foliolate; leaflets subsessile, elliptic-oblong or obovate to spathulate. Racemes terminal, lax, few-flowered, corymbiform. Flowers; pedicels elongate during fruiting. Petals 4, yellow, obovate to oblong-spathulate. Capsules linear-oblong, terete, striate, densely glandular hairy; seeds many, reniform, transversely ridged, reddish-brown.

Flowering & Fruiting : March-July

Notes : It is a Medicinal and a Weed plant

Herbarium:Coll.No.93.KMN/ECY/CTR/PKD,11.02.2021.,Praveenkumar K.(Fl).

122.*Crateva religiosa* G. Forst., Fl. Ins. Austr. 35. 1786. *Crateva magna* (Lour.) DC., Prodr. 1: 243. 1824; E. Vajr., Fl. Palghat Dist. 58. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 29. 2004.*Capparis magna* Lour., Fl. Cochinch. 330. 1790.*Crateva nurvala* Buch.-Ham., Trans. Linn. Soc. London 15: 121. 1827.*Crateva religiosa* var. *nurvala* (Buch.-Ham.) Hook. f. & Thoms. in Hook.f., Fl. Brit. India 1: 172. 1872 "Crataeva".*Crateva adansonii* DC. subsp. *odora* sensu Manilal & Sivar., Fl. Calicut 32. 1982, non (Buch.-Ham.) Jacobs, 1964.

Malayalam Name : Neermathalam.

Distribution : Indo-Malesia and China

Trees. Leaves Alternate, digitately trifoliate. Flowers bisexual, creamy white, in terminal corymbs. Fruit a berry, globose or ovoid, yellowish-grey, rind woody, scurfy; seeds brown, embedded in pulp.

Flowering & Fruiting : March-April

Notes : The bark and leaves are used urinary infection and kidney disorders.

XXII. CARICACEAE

123.*Carica papaya* L., Sp. Pl. 1036. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 599. 1879; Gamble, Fl. Pres. Madras 525(371). 1919; E.Vajr., Fl. Palghat Dist. 211. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 193. 2004. (Plate 14 E).

Malayalam Name : Omakkay, Kappaka, Pappaya

Distribution : Native of Tropical America; cultivated in the tropics and subtropics

Small tree with soft stem and white milky juice. Leaves Alternate, blade deeply divided into several lobes. Plants mostly dioecious rarely monoecious with fragrant and nocturnal flowers. Male inflorescence pendulous raceme. Flower creamy yellow.Fruit large spherical or pyriform usually turning yellow or orange with yellow or orange flesh; seeds black, wrinkled.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and an Exotic plant. Latex given (1-2 ounce) for inducing abortion. There are several horticultural varieties, which varies in the shape, size, colour and taste of the fruits.

Herbarium:Coll.No.187.CTV/KND/PKD/PKD,19.02.2022,PraveenkumarK.(Fl).

XXIII. CARYOPHYLLACEAE

124.*Drymaria cordata* (L.) Willd. ex Roem. & Schult. subsp. diandra (Blume) Duke, Ann. Miss. Bot. Gard. 48: 253. 1961; E. Vajr., Fl. Palghat Dist. 67. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 36. 2004.*Drymaria diandra* Blume, Bijdr. 62. 1825.*Drymaria cordata* Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 244.1874p.p.; Gamble, Fl. Pres. Madras 63(46). 1915; Sasidh., Fl. Parambikulam WLS 19. 2002.*Cerastium cordifolium* Roxb., Fl. Ind. 2: 458. 1832.

Malayalam Name : Panamaala

Distribution : Paleotropics

Diffuse prostrate herbs, rooting at the nodes. Leaves simple, opposite, rounded or ovate, base cordate, or subtruncate, puberulus, membranous; petiole stipular hairs interpetiolar. Cymes axillary or terminal. Sepals lanceolate, green, 3-nerved. Petals white, deeply bilobed. Stamens 3-5. Ovary globose, 1 mm across, style 3 fid. Capsule oblong.

Flowering & Fruiting : Throughout the year

Notes : It is a Weed plant

XXIV. CASUARINACEAE

125.*Casuarina equisetifolia* L., Amoen. Acad. 4: 413. 1759, "Cassarina"; Hook. f.,Fl. Brit. India 5: 598. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1389(972). 1928; E. Vajr., Fl. Palghat Dist. 458. 1990.*Casuarina litorea* Oken, Allg. Naturgesch. 3(1): 354. 1841; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 442. 2004.

Malayalam Name : Chavukku, Choola, Kattadi.

Distribution : Malay Islands, Australia, Pacific

Dioecious trees. Leaves scaly, Alternating with the ribs of the upper node, acute. Male flowers: in terminal pendulous, spikes. Female flowers in axillary spikes of solitary or in pairs, ovoid, reddish-purple, 2-fid. Fruit a carpophore, ovoid or oblong-cylindrical; nutlets compressed; seeds winged.

Flowering & Fruiting : July- September.

Notes : It is an Exotic plant.Used for poles in construction works and also as firewood.

XXV. CHENOPODIACEAE

126.*Dysphania ambrosioides* (L.) Mosyakin & Clemants, Ukrayins'k. Bot. Zhurn. 59: 382 2002.*Chenopodium ambrosioides* L., Sp. Pl. 219. 1753; Hook. f., Fl. Brit. India 5: 4. 1886; Gamble, Fl. Pres. Madras 1181(827). 1925; E. Vajr., Fl. Palghat Dist. 389. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 383. 2004. **Amaranthaceae** (APG).

Malayalam Name : Eechekolli.

Distribution : Native of Tropical America; widely introduced elsewhere

Erect pungent smelling herbs. Leaves Alternate, elliptic to lanceolate, entire to deeply lobed. Flowers bisexual, minute, sessile, clustered in terminal and axillary cymes. Perianth 5-lobed, herbaceous, green. Stamens 5, free. Ovary 1-celled, with solitary ovule; styles 3; stigmas 3. Fruit is an utricle enclosed by the persistent perianth.

Flowering & Fruiting : March-April

Notes : It is a Medicinal, an Exotic and a Weed plant.

XXVI. CLUSIACEAE

127.*Calophyllum apetalum* Willd., Ges. Naturf. Fr. Berlin Mag. 5: 79. 1811; E. Vajr., Fl. Palghat Dist. 69. 1990.*Calophyllum decipiens* Wight, Icon. Pl. Ind. Orient. t. 106. 1839; Dunn in Gamble, Fl. Pres. Madras 76(54). 1915.*Calophyllum wightianum* Wall. ex Planch. & Triana, Ann. Sci. Nat. Bot. ser. 4. 15: 256. 1862; T. Anderson in Hook. f., Fl. Brit. India 1: 274. 1874.*Calophyllum calaba* non L., Sp. Pl. 514. 1753; N. Mohanan & Sivad., Fl. Agasthyamala 81. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 39. 2004. **Calophyllaceae** (APG) (Plate 9 D).

Malayalam Name : Aattupunna, Cherupunna, Punna

Distribution : Western Ghats (Endemic)

Trees, bark surface yellowish-brown. Leaves simple, opposite, decussate, obovate. Flowers bisexual, white, in axillary panicles; peduncle densely rusty pubescent, slender. Sepals white, oblong or obovate. Petals absent. Fruit, ovoid, bright orange or yellowish-orange; pericarp thin, pleasantly sweet, edible; seed ovoid to ellipsoid, pale brown.

Flowering & Fruiting : September-May

Notes : It is a Medicinal plant. According to Stevens, (J. Arnold Arbor. 61.1980), *Calophyllum calaba* is restricted to Sri Lanka and the Indian plant is *Calophyllum apetalum*. His treatment is followed here.

128.*Calophyllum inophyllum* L., Sp. Pl. 513. 1753; T. Anderson in Hook. f., Fl. Brit. India 1: 273. 1874; Dunn in Gamble, Fl. Pres. Madras 76(55). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 40. 2004.*Calophyllum blumei* Wight, Ill. Ind. Bot. 1: 128. 1840.

Malayalam Name : Pinna, Punna

Distribution : Paleotropics

Tree. Leaves opposite, broadly elliptic-oblong or obovate, glabrous. Racemes axillary. Flowers polygamous, white, fragrant; bracts ovate, caducous. Fruit globose to obovoid, shortly apiculate, smooth; stone subglobose.

Flowering & Fruiting : December-January

Notes : It is a Medicinal plant. Timber used for building construction, furniture etc. The leaves are useful in migraine, vertigo and ophthalmic. The seed oil is useful in skin diseases, scabies and strangury. The oil is used for burning lamps.

129.*Garcinia gummi-gutta* (L.) Robs., Brittonia 20: 103. 1968, var. *gummi-gutta;* E. Vajr., Fl. Palghat Dist. 70. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 40. 2004.*Cambogia gummi-gutta* L., Gen. Pl. (ed.5) 522. 1754.*Garcinia cambogia* (Gaertn.) Desr. in Lam., Encycl. 3: 701. 1792; T. Anderson in Hook. f., Fl. Brit. India 1: 261. 1874; Dunn in Gamble, Fl. Pres. Madras 73(53). 1915.*Mangostana cambogia* Gaertn., Fruct. 2: 106. 1790.*Garcinia affinis* Wall. ex Pierre, Fl. Forest. Cochinch. Fasc. 6: 16, t. 78C, 79G. 1883, non Wight & Arn. 1834; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 40. 2004.*Garcinia cornea* Choisy, Descr. Guttif. Ind. 53. 1849, non L.; T. Anderson in Hook. f., Fl. Brit. India 1: 260. (Plate 7 D).

Malayalam Name : Korakkapuli, Kodampuli, Kudapuli.

Distribution : South India and Sri Lanka

Evergreen trees. Leaves simple, opposite, decussate, elliptic or elliptic-oblanceolate or lanceolate, glabrous. Flowers polygamodioecious, yellowish-white. Fruit a berry, ovoid to subglobose, yellow or red, pericarp very thick, fleshy; seeds 6-8, ovoid, compressed, pale brown, veined; aril succulent, white or red.

Flowering & Fruiting : January-September

Notes : It is a Medicinal and an Edible plant. Fruits are edible, used in curries. Fruits used for dysentery, milky juice contain essential oil, resin; used in the treatment of rheumatism and bowel complaints.

Herbarium:Coll.No.11.KMK/TCK/MKD/PKD,22.01.2020,Praveenkumar K.(Fl).

130.*Mesua ferrea* L., Sp. Pl. 515. 1753, var. ferrea; T. Anderson in Hook. f., Fl. Brit. India 1: 277. 1874; Dunn in Gamble, Fl. Pres. Madras 77(55). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 42. 2004.*Calophyllum nagassarium* Burm.f., Flora Ind. 121. 1678.*Mesua nagassarium* (Burm. f.) Kosterm., Ceylon J. Sci. 12, 1: 71. 1976; E. Vajr., Fl. Palghat Dist. 72. 1990. **Calophyllaceae** (APG).

Malayalam Name : Nagapoovu, Nangakilkuru, Nangu, Peri

Distribution : Indo-Malesia

Trees. Leaves simple, opposite, elliptic to oblong- lanceolate, shiny above. Flowers white, scented, solitary or in pairs, axillary, bisexual across. Sepals 4 in two pairs,broadly ovate, persistent. Petals 4, sometimes 5, white with brown veins, obovate or obcordae, margins curled. Fruits ovoid; seeds 1-4, pyriform, dark brown.

Flowering & Fruiting : April-July

Notes : It is a Medicinal plant. Timber used for building construction.

XXVII. COMBRETACEAE

131.*Combretum albidum* G. Don, Trans. Linn. Soc. London 15: 429. 1827; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 171. 2004.*Combretum ovalifolium* Roxb., Fl. Ind. 2: 226. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 2: 458. 1878; Gamble, Fl. Pres. Madras 469(332). 1919; E. Vajr., Fl. Palghat Dist. 196. 1990.

Distribution : Peninsular India and Sri Lanka

Malayalam Name : Manjakody

Lianas. Leaves simple, opposite or subopposite, ovate, orbicular. Spikes compound, axillary; flowers polygamo-dioceous, yellow. Fruit wings chartaceous, red.

Flowering & Fruiting : December-March

Herbarium: Coll.No.135.TKK/CSY/PTB/PKD,21.05.2021.,Praveenkumar K.(Fl).

132.*Combretum indicum* (L.) De Philipps, Useful Pl. Dominica 277. 1998. *Quisqualis indica* L., Sp. Pl. (ed. 2) 556. 1762; C.B. Clarke in Hook. f., Fl. Brit. India 2: 459. 1878; Gamble, Fl. Pres. Madras 469(332). 1919; E. Vajr., Fl. Palghat Dist. 197. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 171. 2004**.** (Plate 16 C).

Malayalam Name : Kulamarinji, Thookuchethi, Yesodhapoovu

Distribution : Native of Myanmar

Woody climbers. Leaves opposite to subopposite, finely pubescent beneath. Spikes terminal. Flowers fragrant; bracts linear. Receptacles narrowly tubular, expanding towards the apex, pubescent without. Sepals triangular reflexed. Petals obovate-oblong, obtuse, white, turning deep red at maturity, finely pubescent. Style adnate to the wall of the upper receptacle for most of its length. Fruit ovate-elliptic, black.

Flowering & Fruiting : July-March

Notes : It is an Exotic and a Garden plant. Widely grown as an ornamental plant, also runs wild. The fruits and seeds are reported to have anthelmintic, antidiarrhoeal and purgative properties.

Herbarium:Coll.No.179.ANK/TCK/MKD/PKD,12.02.2022,PraveenkumarK.(Fl)

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133.*Combretum latifolium* Blume, Bijdr. 641. 1826; E. Vajr., Fl. Palghat Dist. 195. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 171. 2004; .*Combretum extensum* Roxb. ex G. Don, Trans. Linn. Soc. London 15: 414. 1827; C.B. Clarke in Hook. f., Fl. Brit. India 2: 458. 1878; Gamble, Fl. Pres. Madras 469(332). 1919**.**

Malayalam Name : Manjalvalli, Plakkodi, Purakkodi

Distribution : Indo-Malesia

Climbing shrubs. Leaves opposite or sub opposite, elliptic-obovate to oblong-elliptic. Inflorescence of long-peduncled axillary spikes, forming terminal pendulous panicles. Flowers greenish-white, polygamo-dioecious. Receptacle, funnel-shaped from above the ovary. Drupe with 4 membranous wings, transversely striate.

Flowering & Fruiting : December-April

134.*Getonia floribunda* Roxb., Pl. Coromandel 1: 61 1795.*Calycopteris floribunda* Lam., Tabl. Encycl. 2: 485. t. 357.1793; C.B. Clarke in Hook. f., Fl. Brit. India 2: 449.1878; Gamble, Fl. Pres. Madras 467(331). 1919; E. Vajr., Fl. Palghat Dist. 195. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 171. 2004.

Malayalam Name : Pullanni, Pullanji.

Distribution : Indo-Malesia

Lianas. Leaves opposite or subopposite, ovate to elliptic. Flowers in dense axillary racemes, crowded in dense panicles at top of branches. Calyx elliptic cream coloured, velvety, accrescent. Drupe with 5 spreading accrescent calyx lobes; seed single.

Flowering & Fruiting : January-May

Notes : It is a Medicinal plant. Leaf juice used as a cure for fresh wounds and cuts The leaves ae bitter and astringent and used as laxative and anthelmintic and also said to cure dysentery and malaria. These are crushed and applied externally on ulcers. The leaves are employed as fish-poision. The fruits are used in jaundice. The stem contains a large quantity of water which is taken in thirst during emergency.

Herbarium:Coll.No.50.TBK/TCK/MKD/PKD,26.05.2020.,Praveenkumar K.(Fl).

135.*Terminalia bellirica* (Gaertn.) Roxb., Pl. Corom. t. 198. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 2: 445. 1878; Gamble, Fl. Pres. Madras 463(328). 1919; E. Vajr., Fl. Palghat Dist. 196. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 171. 2004.*Myrobalanus bellirica* Gaertn., Fruct. 2: 90. t. 97. ff. a-d.1791, *bellirica*.

Malayalam Name : Thanni, Thannikka, Tusham

Distribution : Indo-Malesia and China

Deciduous trees. Leaves simple, clustered at the tip of branchlets, obovate, elliptic or obovate-elliptic. Flowers bisexual, greenish-yellow, in axillary spikes. Fruit a drupe obovoid, obscurely 5-ridged, yellowish-brown, honed, not winged, softly tomentose; seed one, ellipsoid.

Flowering & Fruiting : December-January

Notes: It is a Medicinal plant, The fruit is used for dyeing and tanning. One of the Thriphala of Ayurveda. Fruit is used in the treatment of diseases of liver and heart, bronchitis, diabetes, indigestion etc. Oil from seeds is applied for the growth of hair. Seeds eaten. Exudation from stem used for relief from itching caused by ticks. The timber is valuable and used for making house, boats, tea-chests, carts and paper. Bark is a good antidote to the allergy caused by Holigarna spp.

Herbarium:Coll.No.94.PKM/CVA/OTP/PKD,12.02.2021.,Praveenkumar K.(Fl).

136.*Terminalia catappa* L., Syst. Nat. (ed.12) 2: 674. 1767 & Mant. Pl. 2: 519. 1771; C.B. Clarke in Hook. f., Fl. Brit. India 2: 444. 1878; Gamble, Fl. Pres. Madras 463(328). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 172. 2004.

Malayalam Name : Badam, Kottakuru, Natu-badam, Oodal.

Distribution : Malaysia to North Australia and Polynesia, commonly planted in the tropics

Trees; branchlets with prominent leaf scars. Leaves simple, Alternate. Flowers polygamous, sessile, white or yellowish-green, in axillary simple, rusty pubescent racemes. Fruits a drupe, broadly ellipsoid to ovoid, laterally compressed, inflated, brown or reddish-brown, glabrous, glossy, mesocarp fibrous; seed 1.

Flowering & Fruiting : March-January

Notes : It is an Exotic and a Garden plant. The kernels resemble Almond and largely eaten in countryside. The bark and leaf are used for dying fibers. The

leaf-juice is applied externally for scabies, leprosy, skin-disease, headache, etc. The timber is used for house construction.

Herbarium:Coll.No.98.MMT/TCK/MKD/PKD,16.02.2021,PraveenkumarK.(Fl).

137.*Terminalia elliptica* Willd., Sp. Pl. 4: 969. 1806; Gangop. & Chakrab., J. Econ. Tax. Bot. 21: 351. 1997; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 172. 2004.*Terminalia alata* Heyne ex Roth, Nov. Pl. Sp. 379. 1821.*Terminalia crenulata* Roth, Nov. Pl. Sp. 380. 1821; Gamble, Fl. Pres. Madras 465(329). 1919; E. Vajr., Fl. Palghat Dist. 197. 1990.*Terminalia coriacea* (Roxb.) Wight & Arn., Prodr. 315. 1834; Gamble, Fl. Pres. Madras 465(329). 1919. *Pentaptera coriacea* Roxb., Fl. Ind. 2: 438. 1832.*Terminalia tomentosa* (Roxb. ex DC.) Wight & Arn., Prodr. 314. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 2: 447. 1878; Gamble, Fl. Pres. Madras 465(329). 1919.*Terminalia tomentosa* (Roxb. ex DC.) Wight & Arn. var. *crenulata* (Roth) C.B. Clarke in Hook. f., Fl. Brit. India 2: 448. 1878.

Malayalam Name : Karimaruthu, Kuramaruthu, Matthi, Thembavu

Distribution : India and Sri Lanka

Deciduous trees. Leaves simple, opposite to subopposite, oblong, oblong-ovate. Flowers bisexual, dull yellow in terminal and axillary paniculate spikes; yellow. Fruit a drupe longitudinally 5-winged, glabrous; wings equal, thin, pubescent, lines on the wings horizontal, apex round, coriaceous, reddish-brown; seed one.

Flowering & Fruiting : April-May

Notes : The bark is used for tanning and dying fabrics and paper. It is bitter and stipic, diuretic, cardiotonic and hypotensive. A decotion of the bark is taken in diarrhoea and ulcers. The gum obtained from the plant is used as purgative and adhesive. The leaves are used for feeding 'Tasar' silkworms. The timber is highly valuable and used for many purposes including construction of house.

138.*Terminalia paniculata* Roth, Nov. Pl. Sp. 383.1821; C.B. Clarke in Hook. f., Fl. Brit. India 2: 448.1878; Gamble, Fl. Pres. Madras 465(329). 1919; E. Vajr., Fl. Palghat Dist. 197. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 172. 2004.*Pentaptera paniculata* (Roth) Roxb., Fl. Ind. 2: 442. 1832. (Plate 11 H).

Malayalam Name : Maruthu, Peimaruthu, Venmaruthu

Distribution : Peninsular India (Endemic)

Deciduous trees. Leaves simple, lower leaves subopposite, upper Alternate. Flowers bisexual, white, sessile, in axillary and terminal panicles, tomentose. Fruit a drupe reddish-brown, rusty tomentose, with one large and 2 small wings; seed one.

Flowering & Fruiting : August-February

Note : Bark and fruits are used for dying and tanning. The bark is said to be diuretic and cardio tonic. Timber used in constructions as beams, scantlings etc.

Herbarium:Coll.No.171.PKK/TCK/MKD/PKD,05.01.2022,PraveenkumarK.(Fl).

XXVIII. COMMELINACEAE

139.*Commelina benghalensis* L., Sp. Pl. 41. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 370. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1539(1075). 1931; E. Vajr., Fl. Palghat Dist. 516. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 497. 2004.

Malayalam Name : Adukkavettila.

Distribution : Africa, India, China, Japan and Malesia

Diffuse herbs. Leaves Alternate, ovate or elliptic-ovate, pubescent, margin ciliate. Spathe funnel-shaped, truncate at apex, pubescent. Petals blue, larger ones broadly ovate. Capsule ellipsoid, 3-celled; seeds 5, subglobose, rugose, pitted.

Flowering & Fruiting : July-November

Notes : It is a Medicinal and a Weed plant

140.*Commelina clavata* C.B. Clarke, Comm. Cyrt. Bengal t. 5. 1874 & in Hook. f., Fl. Brit. India 6: 371. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1539(1074). 1931; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 497. 2004. *Commelina clavata* C.B. Clarke var. *hohenackeri* C.B. Clarke in DC. Mon. Phan. 3: 171. 1881 & in Hook. f., Fl. Brit. India 6: 371. 1894.

Malayalam Name : Kaina, Kalani

Distribution : India, Sri Lanka and Java

Herbs. Leaves lanceolate, long ciliate. Cymes axillary; spathe broadly ovate, acuminate, Outer sepals cucullate; inner 2, smaller. Petals obovate. Stamens 3, unequal, lateral long, medial half in length of lateral; staminodes 3, equal, antherode violet with yellow to creamy yellow lobes, filaments hairy. Capsule oblong to elliptic, 2-6 per spathes, 2-locular, dorsal locule not developed or empty, ventral locule 1 or 2 seeded; seeds pitted.

Flowering & Fruiting : September-June

Herbarium:Coll.No.45.TTK/VZY/OTP/PKD, 20.05.2020., Praveenkumar K.(Fl).

141.*Cyanotis axillaris* (L.) D. Don, Prodr. Fl. Nepal. 46.1825; C.B. Clarke in Hook f., Fl. Brit. India 6: 388.1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1550(1082). 1931; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 499. 2004.*Commelina axillaris* L., Sp. Pl. 42. 1753.*Tonningia axillaris* (L.) Kuntze, Rev. Gen. Pl. 2: 722. 1891; E. Vajr., Fl. Palghat Dist. 524. 1990.*Amischophacelus axillaris* (L.) R.S. Rao & Kammathy, J. Linn. Soc. Bot. 59. 306. 1966.

Distribution : Indo-Malesia

Fleshy decumbent, glabrous herbs. Leaves linear, mouth ciliate. Inflorescence in axillary cymose clusters, enclosed within the leaf sheath. Flowers Calyx connate, tube pilose; lobes lanceolate. Corolla blue; tube lobes ovate. Capsule oblong, apex beaked; seeds 6, oblong, pitted.

Flowering & Fruiting : August-December

142.*Cyanotis cristata* (L.) D. Don, Prodr. Fl. Nepal. 46. 1825; C.B. Clarke in Hook. f., Fl. Brit. India 6: 385. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1549(1081). 1931; E. Vajr., Fl. Palghat Dist. 519. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 499. 2004. *Commelina cristata* L., Sp. Pl. 42. 1753.

Distribution : Paleotropics

Fleshy, robust herbs. Leaves ovate-oblong, base rounded or cordate. Cymes mostly terminal, recurved, solitary. Flowers; Calyx hirsute. Corolla pale blue,

pink to purple. Capsule subglobose; seeds trigonous, striated with 2 large pits on either side.

Flowering & Fruiting : July-October

Notes : It is a Weed plant

Herbarium:Coll.No.146.KVP/KDI/PKD/PKD,28.06.2021.,Praveenkumar K.(Fl).

143.*Murdannia dimorpha* (Dalz.) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 15a: 173. 1930; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 500. 2004.*Aneilema dimorpha* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 138. 1851; C.B. Clarke in Hook. f., Fl. Brit. India 6: 377. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1545(1078). 1931.*Aneilema paniculata* Wight, Icon. Pl. Ind. Orient. t. 2075. 1853.

Distribution : Peninsular India and Sri Lanka

Erect tufted annual herbs, pubescent. Leaves simple, Alternate, glandular below. Cymes panicled, terminal; bracteoles spaced, slender, glabrous. Flowers Sepals ovate, acute. Petals obovate, glabrous, lilac to lavender. Capsule oblong, glabrous; seeds cubical, light-dark brown, rugose-ruminate, with raised ridges, hilum punctiform-oblong.

Flowering & Fruiting : July-September

144.*Murdannia pauciflora* (Wight) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 15a: 173. 1930; E. Vajr., Fl. Palghat Dist. 523. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 502. 2004.*Aneilema pauciflorum* Wight, Icon. Pl. Ind. Orient. t. 2077. 1853; C.B. Clarke in Hook. f., Fl. Brit. India 6: 378. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1545(1078). 1931.*Murdannia wightii* R.S. Rao & Kammathy, Notes Roy. Bot. Gard. Edinb. 25: 184. 1964.

Distribution : Indo-Malesia

Decumbent, spreading herbs. Leaves ovate-lanceolate, hairy. Flowers in axillary and terminal cymes; pedicels usually deflexed in fruits. Petals brownish-yellow, oblong, acute. Capsule oblong-fusiform, subtrigonous, acute; seeds 1-seriate, black, sparsely pitted.

Flowering & Fruiting : September-November

Herbarium: Coll.No.12.SCM/MTL/PTB/PKD,23.01.2020, Praveenkumar K.(Fl).

145.*Murdannia spirata* (L.) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 15a: 173. 1930; E. Vajr., Fl. Palghat Dist. 524. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 502. 2004.*Commelina spirata* L., Mant. Pl. 2: 176. 1771.*Aneilema spiratum* (L.) Sweet, Hort. Suburb. London 12: 1808; C.B. Clarke in Hook. f., Fl. Brit. India 6: 377. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1546(1078). 1931.

Distribution : Indo-Malesia

Erect or diffuse herbs with fibrous roots. Leaves ovate-lanceolate, sheath ciliate at mouth. Flowers in few-flowered terminal and axillary panicles. Petals bluish or violet, oblong. Fertile stamens 3, filaments bearded; staminodes 2. Ovules 3 in each cell. Capsule oblong, trigonous; seeds 3 in each cell, angular, cuboid, rugose, light brown.

Flowering & Fruiting : August-November.

Herbarium:Coll.No.129.PSK/TCK/MKD/PKD,22.04.2021,Praveenkumar K.(Fl).

XXIX. CONNARACEAE

146.*Connarus monocarpus* L., Sp. Pl. 675. 1753; Hook. f., Fl. Brit. India 2: 50. 1876; Gamble, Fl. Pres. Madras 272(194). 1918; E. Vajr., Fl. Palghat Dist. 141. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 314. 2004.

Malayalam Name : Kuriel, Puzhukkadikaya.

Distribution : Indo-Malesia

Scandent shrubs. Leaves imparipinnate; leaflets 3 or 5, elliptic or elliptic-ovate. Flowers in terminal, pyramidal paniculate cymes. Petals linear-oblanceolate, creamy white. Fruit a follicle, obovoid, fusiform, compressed, more or less falcate, scarlet red; seed single, ovoid, surrounded at base with a large, pulpy, bright yellow aril.

Flowering & Fruiting : April-June

Notes : It is a Medicinal plant.

147.*Rourea minor* (Gaertn.) Merr., Interpr. Rumph. Herb. Amboin. 413. 1917; E. Vajr., Fl. Palghat Dist. 141. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 315. 2004.*Aegiceras minor* Gaertn., Fruct. 1: 216. t.46. 1788.*Rourea santaloides* (Vahl) Wight & Arn., Prodr. 144. 1834; Hook. f., Fl. Brit. India 2: 47. 1876; Gamble, Fl. Pres. Madras 271(193). 1918.*Connarus santaloides* Vahl, Symb. Bot. 4: 87. 1794.*Tali minor* (Gaertn.) M.R. Almeida, Fl. Maharashtra 1: 283. 1996..

Malayalam Name : Cheriyamarikunni, Kuriel

Distribution : India, Sri Lanka, Bangladesh and Malesia

Large woody climbing shrubs. Leaves imparipinnate; thin-coriaceous. Flowers in axillary panicled cymes. yellowish flowers.Follicles oblong, slightly curved, accrescent calyx and basal portion of style persistent; seed 1, obovate; aril red, sheathing at base.

Flowering & Fruiting : December-August

Herbarium:Coll.No.200.PBK/KVS/ALT/PKD,12.04.2022.,Praveenkumar K.(Fl).

XXX.CONVOLVULACEAE

148.*Argyreia bracteata* Choisy in Mém. Soc. Phys. Genève 6: 412. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 4: 188. 1883; Gamble, Fl. Pres. Madras 907(637). 1923; E. Vajr., Fl. Palghat Dist. 306. 1990.

Distribution : South India (Endemic)

Twining shrubs. Leaves simple, Alternate, ovate to orbicular, glabrous above or sparsely hairy on veins. Inflorescence an axillary subcapitate cyme, flowers 4-7 per cymet. Corolla infundibuliform, rose pink, throat purple, limb shallowly lobed or undulate. Fruit a berry, yellow when ripen; seeds trigonal, black.

Flowering & Fruiting : May- January

149.*Camonea umbellata* (L.) A.R. Simões & Staples, Bot. J. Linn. Soc. 183(4): 583. 2017.*Convolvulus umbellatus* L., Sp. Pl. 155. 1753.*Merremia umbellata* (L.) Hall. f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 928(651). 1923; E.

Vajr., Fl. Palghat Dist. 313. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 312. 2004.*Ipomoea cymosa* Roem. & Schult., Syst. Veg. 4: 241. 1819; C.B. Clarke in Hook. f., Fl. Brit. India 4: 211. 1883.

Malayalam Name : Kolavaravalli, Koravalli, Vayara

Distribution : Native of Tropical & Subtropical America, West & West Central Tropical Africa; naturalised in Tropical Asia

Twiners; young shoots puberulous. Leaves Alternate, ovate-lanceolate, pubescent below. Inflorescence axillary umbelliform cymes. Sepals, ovate-lanceolate, apiculate, scarious on margins. Corolla white, campanulate; tube, pubescent without. Capsule ovoid; seeds long hairy, black.

Flowering & Fruiting : January-April

Notes : It is a Weed plant

Herbarium:Coll.No.112.PBK/KVS/ALT/PKD,28.02.2021.,Praveenkumar K.(Fl).

150.*Camonea vitifolia* (Burm. f.) A.R. Simões & Staples, Bot. J. Linn. Soc. 183(4): 583. 2017.*Convolvulus vitifolius* Burm. f., Fl. Ind. 45.t.18. 1768.*Merremia vitifolia* (Burm. f.) Hall.f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 928(651). 1923; E. Vajr., Fl. Palghat Dist. 314. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 312. 2004.*Ipomoea vitifolia* (Burm. f.) Blume, Bijdr. 709. 1826; C.B. Clarke in Hook. f., Fl. Brit. India 4: 213. 1883.

Malayalam Name : Manja vayaravalli, Manja kolambi valli

Distribution : Indo-China and China

Twining shrubs. Leaves Alternate, lobed, equally wide, base cordate. Inflorescence axillary, 1-3-flowered cymes. Sepals ovate-lanceolate, mucronate, outer hirsute, inner glabrescent. Corolla yellow, campanulate. Stamens included. Ovary 2-celled, ovules 2 in each cell. Capsule, globose, fruiting sepals much larger; seeds 4, ovoid.

Flowering & Fruiting : November-February

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.123.KNT/LPR/OTP/PKD,08.04.2021.,Praveenkumar K.(Fl).

151.*Evolvulus alsinoides* (L.) L., Sp. Pl. (ed. 2) 392. 1762, var. *alsinoides*; C.B. Clarke in Hook. f., Fl. Brit. India 4: 220. 1883; Gamble, Fl. Pres. Madras 922(648). 1923; Sasidh., Fl. Parambikulam WLS 206. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 306. 2004.*Convolvulus alsinoides* L., Sp. Pl. 157. 1753.

Malayalam Name : Krishnakranti, Sivakranthi, Vishnukranthi

Distribution : Pantropical

Small prostrate much branched villous herbs. Leaves simple, Alternate, more or less distinctly in 2 rows, broadly elliptic to elliptic-lanceolate. Flowers solitary or paired, at axils; silky hairy; bracts linear. Calyx lobes lanceolate, silky hairy. Corolla blue or white. Ovules 2 in each cell; styles 2, each longitudinally 2-fid. Capsule globose, 2-valved; seeds usually 4, minute.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant. The whole plant is used in several medicinal preparations. It is considered an aphrodisiac and brain stimulant toning up the intellectual powers. The drug is also useful in the cure of nervous debility and dysentery. The flowers are reported to be good in the treatment of uterine bleeding and roots for gastric and dueodinal ulcers (Sivarajan & Indira Balachandran, 1994).

152.*Hewittia malabarica* (L.) Suresh in Nicolson *et al.*, Interp. Hort. Malab. 88. 1988; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 306. 2004.*Convolvulus malabaricus* L., Sp. Pl. 155. 1753.*Hewittia scandens* (Milne) Mabb. in Manilal, Bot. Hist. Hort. Malab. 84. 1980; E. Vajr., Fl. Palghat Dist. 307. 1990.*Convolvulus bicolor* Vahl, Symb. Bot. 3: 25. 1974, non Desr. 1792.*Hewittia bicolor* (Vahl) Wight & Arn., Madras J. Lit. Sci. 5: 22. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 4: 216. 1883; Gamble, Fl. Pres. Madras 924(649). 1923.*Hewittia sublobata* (L.f.) Kuntze, Rev. Gen. Pl. 2: 441. 1891; V.T. Antony, Syst. Stud. Fl. Kottayam Dist. 261. 1989.

Malayalam Name : Ohanamvalli, Vattapoomthani

Distribution : Asia, Africa and South America

Annual or biennial herbs. Leaves simple, Alternate, ovate, margin entire or angled, puberulent. Flowers in axillary, 1 to few-flowered peduncled cymes; peduncle, terete, pubescent. Corolla pale yellow to white with a purple centre. Capsule 4-valved, , subglobose; seeds 4 or less, subtrigonous, black.

Flowering & Fruiting : October-January

Notes : It is a Medicinal plant.

153.*Ipomoea aquatica* Forssk., Fl. Aeg.-Arab. 44. 1775; C.B. Clarke in Hook. f., Fl. Brit. India 4: 210. 1883; E. Vajr., Fl. Palghat Dist. 309. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 307. 2004.*Ipomoea reptans* Poir. in Lam., Encycl. Suppl. 3: 460. 1814; Gamble, Fl. Pres. Madras 916(643). 1923.

Malayalam Name : Kozhuppa, Neermuthakku

Distribution : Pantropics

Creeping or floating aquatic herbs. Leaves Alternate, , varies in form, usually oblong-lanceolate or narrowly triangular. Flowers solitary or a few in cymes. Corolla funnel-form, pale purple to nearly white, lobes obscure. Capsule globose; seeds, black, minutely pubescent.

Flowering & Fruiting : November-March

Notes : It is a Medicinal plant. Leaves used as vegetable

Herbarium:Coll.No.182.PKM/CVA/OTP/PKD,18.02.2022,PraveenkumarK.(Fl).

154.*Ipomoea cairica* (L.) Sweet, Hort. Brit. (ed. 1) 287. 1827; Gamble, Fl. Pres. Madras 918(645). 1923; Sasidh., Fl. Parambikulam WLS 207. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 307. 2004.*Convolvulus cairicus* L., Syst. Nat. (ed.10) 922. 1759. *Ipomoea palmata* Forssk., Fl. Aeg.-Arab. 43. 1775; C.B. Clarke in Hook. f., Fl. Brit. India 4: 214. 1883.

Malayalam Name : Kolambipoo, Paavadapoo

Distribution : Paleotropics

Extensive climbers with tuberous root. Leaves Alternate, pedately foliolate, orbicular in outline. Flowers solitary or in short racemes. Corolla pink, funnel-

shaped. Capsule, subglobose; seeds, subglobose to ovoid, blackish, pubescent, hairy along margin.

Flowering & Fruiting : September-May

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.209.NKP/PKY/ALT/PKD,25.11.2022,Praveenkumar K.(Fl).

155.*Ipomoea hederifolia* L., Syst. Nat. (ed. 10) 925. 1759; E. Vajr., Fl. Palghat Dist. 311. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 308. 2004. *Quamoclit phoenicea* (Roxb.) Choisy, Mem. Soc. Phys. Geneve 6: 433. 1834; Gamble, Fl. Pres. Madras 919(645). 1923.*Ipomoea phoenicea* Roxb., Fl. Ind. 2: 92. 1824.*Ipomoea coccinea* sensu C.B.Clarke in Hook. f., Fl. Brit. India 4: 199. 1883, non Rottl. 1803. (Plate 16 F).

Malayalam Name : Theepori mulla, Kanavallikodi

Distribution : Native of Tropical America; now naturalised in Tropical Asia

Slender twining glabrous herbs. Leaves Alternate, simple, ovate to suborbicular, glabrous. Cymes few-flowered, axillary. Corolla deep red, salver-form, subentire. Stamens 5; filaments subequal, attached above the base of tube, exserted. Ovary, conical, 4-celled; ovule 1 in each cell. Capsule, subglobose; seeds 4, pyriform, black.

Flowering & Fruiting : October-December

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.109.KPB/MLK/ALT/PKD,27.02.2021,Praveenkumar K.(Fl).

156.*Ipomoea marginata* (Desr.) Verdc. f. candida (Naik & Zate) Das & Lakshmin., J. Econ. Taxon. Bot. 24: 449. 2000.*Ipomoea maxima* (L. f.) Sweet, f. candida Naik & Zate, Fl. Marathwada 1: 590. 1998. (Plate 10 F).

Distribution : South West India (Endemic)

Twining herbs; young stem sparse to moderately patent hairy. Leaves simple, Alternate, triangular-cordiform, thinly pubescent. Cymes sub-umbellate. Sepals

sub-equal, obovate, glabrous. Corolla white, salver-form; lobes spreading. Stamens included. Capsule globose; seeds pubescent.

Flowering & Fruiting : June-December.

157.*Ipomoea obscura* (L.) Ker-Gawl., Bot. Reg. 3. t. 239. 1817; C.B. Clarke in Hook. f., Fl. Brit. India 4: 207. 1883; Gamble, Fl. Pres. Madras 916(643). 1923; Sasidh., Fl. Parambikulam WLS 208. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 309. 2004.*Convolvulus obscurus* L., Sp. Pl. (ed. 2) 220. 1762.

Malayalam Name : Cherutali, Thiruthali

Distribution : China, Tropical Asia and Africa

Slender twining herbs. Leaves simple, Alternate, ovate to cordate, pubescent or glabrescent on both surfaces. Flowers solitary or in subumbellate cymes, yellowish, throat purplish. Capsule subglobose, apically beaked; ovoid, black, thinly pubescent.

Flowering & Fruiting : October-March

Notes : It is a Medicinal plant.

158.*Ipomoea pes-tigridis* L., Sp. Pl. 162. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 204. 1883; Gamble, Fl. Pres. Madras 918(644). 1923; E. Vajr., Fl. Palghat Dist. 311. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 310. 2004.*Ipomoea pes-tigridis* L. var. *hepaticifolia* (L.) C.B. Clarke in Hook. f., Fl. Brit. India 4: 204. 1883.*Ipomoea hepaticifolia* L., Sp. Pl. 161. 1753.

Malayalam Name : Naripadam, Pulichuvadi, Pulichuvatu.

Distribution : Pantropic.

Densely hispid twiners. Leaves Alternate, broadly orbicular; lobes obovate. Flowers subsessile in axillary. Calyx-lobes unequal, ovate-acuminate, pubescent. Corolla white, funnel-form, median bands sparsely pubescent. Stamens included; filaments glabrous. Ovary, conical. Capsule, ovoid, brown; seeds 4 mm long, pubescent, black.

Flowering & Fruiting : September-December

Notes : It is a Medicinal plant

Herbarium:Coll.No.85.ANK/TCK/MKD/PKD,13.01.2021,Praveenkumar K.(Fl).

159.*Ipomoea staphylina* Roem. & Schult., Syst. Veg. 4: 249. 1819; C.B. Clarke in Hook. f., Fl. Brit. India 4: 210. 1883; Gamble, Fl. Pres. Madras 917(643). 1923; E. Vajr., Fl. Palghat Dist. 312. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 310. 2004.*Ipomoea racemosa* Roth, Nov. Pl. Sp. 115. 1821

Distribution : India, China and Sri Lanka

Twining shrubs. Leaves simple, Alternate, broadly ovate, membranous. Panicle of cymes axillary. Outer sepals, oblong, obtuse, inner obovate with hyaline margins. Corolla, shallowly 5-lobed, funnel shaped, pink with purple center. Stamens 5, included, base dilated, hairy; filaments; anthers . Ovary; style, stigma 2, globose.

Flowering & Fruiting : January-April.

160.*Xenostegia tridentata* (L.) Austin & Staples subsp. hastata (Desr.) Panigrahi & Murti, Fl. Bilaspur 1: 395. 1989; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 313. 2004.*Convolvulus hastatus* Desr. in Lam., Encycl. 3: 542. 1792.*Merremia tridentata* (L.) Hall. f. subsp. hastata (Desr.) Ooststr., Blumea 3: 317, f.2. 1939 & Fl. Males. 4(4): 445. f.27a.1953.*Merremia hastata* (Desr.) Hall. f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 929(652). 1923.

Malayalam Name : Cheruvayera, Prasarani

Distribution : Paleotropics

Prostrate many branched herbs. Leaves oblong-obovate, subsessile. Flowers solitary, axillary, creamy white. Calyx lobes lanceolate, apiculate. Capsule globular with persistent accrescent calyx lobes.

Flowering & Fruiting : September-March

Notes : It is a Medicinal plant

XXXI. CRASSULACEAE

161.*Bryophyllum pinnatum* (Lam.) Oken, Allg. Naturgesch. 3(3): 1966. 1841; Gamble, Fl. Pres. Madras 451(319). 1919.*Cotyledon pinnata* Lam., Dict. 2: 141. 1786.*Kalanchoe pinnata* (Lam.) Pers., Syn. 1: 446. 1805; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 168. 2004.*Bryophyllum calycinum* Salisb., Parad. Lond. t.3. 1805; Hook.f., Fl. Brit. India 2: 413. 1878. (Plate 17 G).

Malayalam Name : Ilamulachi

Distribution : Originally from Tropical Africa; now Pantropical

Subsucculent herbs. Leaves decussate, simple, elliptic-ovate base cuneate, margin deeply crenate. Inflorescence a cymose panicle; flowers pendulous. Corolla greenish, 8-folded, glandular within. Stamens 8, inserted above the constriction of corolla; hypogynous scales 4. Carpels 4; ovules many. Follicle enclosed within the reddish calyx.

Flowering & Fruiting : December-March

Notes : It is a Medicinal, an Exotic, a Garden and a Poison plant

XXXII. CUCURBITACEAE

162.*Coccinia grandis* (L.) Voight, Hort. Suburb. Calcutt. 59. 1845; Chakrav., Fasc. Fl. Ind. 11: 24. 1982; E. Vajr., Fl. Palghat Dist. 212. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 194. 2004.*Bryonia grandis* L., Mant. 1: 126. 1767.*Coccinia indica* Wight & Arn., Prodr. 347. 1834; Gamble, Fl. Pres. Madras 537(379). 1919.*Cephalandra indica* (Wight & Arn.) Naud., Ann. Sci. Nat. Bot. ser. 5, 16. 1866; C.B. Clarke in Hook. f., Fl. Brit. India 2: 621. 1879.*Coccinia cordifolia* (L.) Cogn. in A. & C.DC., Monogr. Phan. 3: 529. 1881.

Malayalam Name : Kova, Koval

Distribution : Tropical Africa, Tropical & Subtropical Asia

Perennial shrubs. Leaves simple, Alternate, palmately 3-5-lobed or angled. Flowers axillary, solitary. Male flower: corolla white, campanulate, villous. Female flowers: corolla white. Fruit ovoid-oblong; pulp red; seeds oblong, compressed.

Flowering & Fruiting : December-April

Notes : It is a Medicinal and an Edible plant.There are some horticultural varieties with larger elongated fruits and less bitterness. Aqueous extract of the roots, leaves and mucilage from young fruits used for diabetes. Possess orally effective hypoglycaemic activity.

Herbarium:Coll.No.33.PKK/NLY/OTP/PKD,25.02.2020., Praveenkumar K.(Fl).

163.*Cucumis maderaspatanus* L., Sp. Pl. 1012. 1753.*Bryonia cordifolia* L., Sp. Pl. Pl. 1012. 1753.*Bryonia scabrella* L.f., Suppl. Pl. 424. 1781.*Mukia scabrella* (L. f.) Arn. in Hook.'s, J. Bot. 3: 276. 1841; C.B. Clarke in Hook. f., Fl. Brit. India 2: 623. 1879.*Melothria maderaspatana* (L.) Cogn. in A. & C.DC., Monogr. Phan. 3: 623. 1881; Gamble, Fl. Pres. Madras 539(381). 1919; E. Vajr., Fl. Palghat Dist. 213. 1990.*Mukia maderaspatana* (L.) Roem., Syn. Monogr. 2: 47. 1846; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 197. 2004.

Malayalam Name : Kasappuchedi, Mukkalppeeram, Mukkapperam

Distribution : Paleotropics

Annual herbaceous climbers. Leaves simple, Alternate, ovate; spineus serrate, densely scabrous. Male flowers 8-12 together, yellow. Calyx densely hairy outside, lobes linear. Petals obovate, yellow. Female flowers solitary or 2-3 together. Berry seeds obovate, marginate, yellowish white, rugose.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant. Leaf juice and seed powder mixed and given for the treatment of diabetes.

Herbarium:Coll.No.134.ANK/TCK/MKD/PKD,28.04.2021,PraveenkumarK.(Fl)

164.*Diplocyclos palmatus* (L.) Jeffrey, Kew Bull. 15: 352. 1962; E. Vajr., Fl. Palghat Dist. 212. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 195. 2004.*Bryonia palmata* L., Sp. Pl. 1012. 1753.*Bryonia laciniosa* L., Sp. Pl. 1013. 1753,p.p. excl. typus; Wight, Icon. Pl. Ind. Orient. t. 500. 1841; C.B. Clarke in Hook. f., Fl. Brit. India 2: 622. 1879.*Bryonopsis laciniosa* sensu Naud., Ann. Sci. Nat. Bot. ser. 4, 12: 141. 1859; Gamble, Fl. Pres. Madras 534(377). 1919.

Malayalam Name : Naiunnikkai, Neyyunni, Pambukodi, Sivavalli

Distribution : Indo-Malesia, China and Africa

Climbers. Leaves, palmately 5-lobed, orbicular-cordate, basally 5-7-ribbed; scabrid above; lobes elliptic-oblong, acuminate. Flowers monoecious; male and female flowers in axillary clusters; corolla greenish-yellow. Fruit globose, with vertical greenish and white patches; seeds ovoid, compressed with crenulate, transverse ridge.

Flowering & Fruiting : November-January

Notes : It is a Medicinal and a Poison plant

Herbarium: Coll.No.87.CST/TVP/PTB/PKD, 19.01.2021., Praveenkumar K.(Fl).

165.*Luffa cylindrica* (L.) Roem., Syn. Monogr. 2: 63. 1846; Chakrav., Fasc. Fl. Ind. 11: 70. 1982; E. Vajr., Fl. Palghat Dist. 213. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 196. 2004.*Momordica cylindrica* L., Sp. Pl. 1009. 1753.*Luffa aegyptiaca* Mill., Gard. Dict. (ed. 4) 500.1785; C.B. Clarke in Hook. f., Fl. Brit. India 2: 614.1879; Gamble, Fl. Pres. Madras 533(376). 1919.*Luffa pentandra* Roxb., Fl. Ind. 3: 712. 1832.

Malayalam Name : Peechinga, Perumpeeram

Distribution : Paleotropics, often cultivated

Climbing herbs. Leaves 5-(7)-lobed, orbicular or broadly ovate in outline. Flowers monoecious, male and female on same axil. Male flowers in racemes, clustered, petals 5, yellow. Female flowers solitary, co-axillary with male flower; ovary oblong, 1-locular; ovules many. Fruits, oblong, fibrous within; seeds many, ovoid, compressed, black.

Flowering & Fruiting : February-December

Herbarium:Coll.No.49.ABK/AKR/PTB/PKD, 25.05.2020., Praveenkumar K.(Fl).

166.*Momordica dioica* Roxb. ex Willd., Sp. Pl. 4: 605.1805; C.B. Clarke in Hook. f., Fl. Brit. India 2: 617.1879; Gamble, Fl. Pres. Madras 531(375). 1919; E. Vajr., Fl. Palghat Dist. 214. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 197. 2004.

Malayalam Name : Vempaval, Vennpavel

Distribution : Indo-Malesia and China

Climbing herbs with tuberous roots. Leaves broadly ovate, deeply 3-5-lobed. Flowers dioecious, solitary, axillary. Male flowers with long peduncles with foliaceous bracts at apex. Calyx tube linear, villous. Petals oblong, obtuse, yellow. Fruit ovoid, softly echinate. Seeds ovoid, emarginate, pale yellow.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant

Herbarium:Coll.No.145.SHK/KPM/PTB/PKD,15.06.2021,Praveenkumar K.(Fl).

167.*Solena amplexicaulis* (Lam.) Gandhi in Saldanha & Nicolson, Fl. Hassan Dist. 179. 1976; E. Vajr., Fl. Palghat Dist. 215. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 197. 2004. *Bryonia amplexicaulis* Lam., Encycl. 1: 496. 1785.*Melothria amplexicaulis* (Lam.) Cogn. in A. & C.DC., Monogr. Phan. 3: 621. 1881; Gamble, Fl. Pres. Madras 539(380). 1919.*Melothria heterophylla* (Lour.) Cogn. in A. & C.DC., Monogr. Phan. 3: 618.1881; Gamble, Fl. Pres. Madras 539(380). 1919.

Malayalam Name : Kakkarikka, Karuvikizhangu.

Distribution : South India, Myanmar

Climbers stem almost glabrous. Leaves simple, Alternate, ovate or narrowly elliptic, Male inflorescences: raceme condensed, 5-10-flowered; flowers glabrous except petals; petals long-triangular, hairy at both sides. Female flowers: solitary, glabrous; ovary consisting of an ovoid, fertile part, at apex narrowed, 'neck'; receptacle-tube,; petals ovate-elliptic,; glabrous. Fruit ovoid, , base rounded, at apex tapering into a narrow beak glabrous; red and pulpy when ripe;; seeds 1-4.

Flowering & Fruiting : July-January

Notes : It is a Medicinal and an Edible plant

Herbarium:Coll.No.165.PNS/KPM/PTB/PKD,22.12.2021.,Praveenkumar K.(Fl).

168.*Trichosanthes cucumerina* L., Sp. Pl. 1008. 1753. var. cucumerina; C.B. Clarke in Hook. f., Fl. Brit. India 2: 609. 1879; Gamble, Fl. Pres. Madras 529(373). 1919; E. Vajr., Fl. Palghat Dist. 215. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 198. 2004. (Plate 5 G).

Malayalam Name : Kattupadavalam, Kayappanpadavalam.

Distribution : Indo-Malesia

Annual climbers. Leaves palmately 3-5-lobed, broadly ovate or sub-orbicular. Male flowers in axilliary racemes, white. Female flowers solitary; pubescent; ovary narrowly fusiform. Fruits ovoid-fusiform to long cylindrical with tapering apex, beaked, small to very long, often twisted; seeds oblong, finely rugulose.

Flowering & Fruiting : December-May

Notes : It is a Medicinal plant

Herbarium:Coll.No.183.SDK/KPM/PTB/PKD,18.02.2022.,Praveenkumar K.(Fl).

169.*Zanonia indica* L., Sp. Pl. (ed. 2) 1457. 1763; C.B. Clarke in Hook. f., Fl. Brit. India 2: 633. 1879; Gamble, Fl. Pres. Madras 543(383). 1919; E. Vajr., Fl. Palghat Dist. 216. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 199. 2004.

Malayalam Name : Churuttuvellari, Peenarvalli, Savakettuvalli

Distribution : India, Sri Lanka

Woody dioecious, perennial climbers. Leaves 8-22 ovate-oblong. Flowers small, males arranged in lax pendulous panicles, females racemose.. Fruit elongate-cylindrical, 3-valved at the truncate apex; seeds oblong, compressed, surrounded by a large membranous wing.

Flowering & Fruiting : October-November

Notes : It is a Medicinal plant. de Wilde & Duyfjes (2007) in the revision of the genus recognized two sub species viz Z. indica subsp. indica and Z. indica subsp. orientalis de Wilde & Duyfjes. The former is restricted to south India and

Sri Lanka and the latter to the NE India, China, Indochina, Malesia, south-east to New Guinea region.

XXXIII. CYCADACEAE

170.*Cycas circinalis* L., Sp. Pl. 1188. 1753; Hook f., Fl. Brit. India 5: 656. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1394(975). 1928; E. Vajr., Fl. Palghat Dist. 459. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 597. 2004.

Malayalam Name : Eenth, Eenthinpana.

Distribution : Indo-Malesia and Tropical East Africa

Dioecious large shrubs to small trees with stout palm-like trunk covered in thick and corky bark. Leaves pinnate, arranged in a terminal crown. Microsporophylls densely aggregated to form large terminal cones, with a terminal spine. Megasporophylls loosely arranged, crowded around the apex of stem; ovules 3-10 ovules, on either side of sporophyll, sterile part rhomboid, tapering into a long spine strongly dentate or spinous toothed along margin. Seeds subglobular to elongated, the sarcotesta spongy, fibrous, light yellow, reddish-yellow or brown at maturity.

Flowering & Fruiting : December-February

Notes : It is a Medicinal plant. Seeds are edible after drying and storing for a long time. Male flowers are used to eradicate rats from paddy fields.

XXXIV. CYPERACEAE

171.*Cyperus castaneus* Willd., Sp. Pl. 1: 278. 1797; C.B. Clarke in Hook. f., Fl. Brit. India 6: 598. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1639(1139). 1931; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 525. 2004.

Distribution : Indo-Malesia to Northern Australia

Erect, tufted, non-rhizomatous annual herbs. Leaves few, basal, linear, acute, canaliculate. Inflorescence simple or congested into a single head; Glumes oblong, sub-obtuse, mucronate, strongly keeled, mucro recurved, chestnut brown. Stamen 1. Stigmas 3. Nut oblong, trigonous, apiculate, red-brown.

Flowering & Fruiting : July-November

Notes : It is a Weed plant

172.*Cyperus compressus* L., Sp. Pl. 46.1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 605.1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1640(1140).1931; E. Vajr., Fl. Palghat Dist. 543. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 526. 2004.

Distribution : Pantropical

Erect, tufted, non-rhizomatous annual herbs. Leaves few, basal, linear, acuminate, flat or folded; sheaths pale brown. Inflorescence simple, usually yellowish-green, 6-40-flowered; rachilla flexuous, with caduceus wings, with. Glumes ovate, mucronate at acute apex, 4-nerved on both sides, with hyaline margins; keel 3-nerved. Stamens 3. Stigmas 3. Nut obovoid, triquetrous, apiculate, dark brown.

Flowering & Fruiting : Throughout the year

173.*Cyperus iria* L., Sp. Pl. 45. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 606. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1640(1140). 1931; E. Vajr., Fl. Palghat Dist. 545. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 528. 2004. *Cyperus iria* L. var. *paniciformis* C.B. Clarke in Hook. f., Fl. Brit. India 6: 607. 1893.

Distribution : Tropical Asia and East Africa; introduced in U.S.A and West Indies

Erect non-rhizomatous annual herbs with yellowish fibrous roots; culms triquetrous. Leaves few, basal, linear, flat, gradually acuminate; sheaths purplish-brown. Inflorescence compound, loose and, diffuse, branches spicate. Spikelets linear-oblong, flattened; rachilla straight, wingless bearing 6-10 florets, yellowish.. Nut obovate, triquetrous, stipitate, brown.

Flowering & Fruiting : November-December

Notes : It is a Weed plant

174.*Cyperus mindorensis* (Steud.) Huygh, Phytotaxa 166: 39. 2014.*Kyllinga mindorensis* Steud., Syn. Pl. Glumac. 2: 67. 1854.*Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Dandy ex Hutch. & Dalz., Fl. W. Trop. Africa 2: 486,487. 1936; E. Vajr.,

Fl. Palghat Dist. 552. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 540. 2004. *Thryocephalon nemoralis* J.R. Forst. & G. Forst., Char. Gen. 129. t. 130. 1776.*Kyllinga monocephala* Rottb., Desc. Nov. Pl. 13. t. 4, f. 4. 1773, non Roxb. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 6: 588. 1893; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1624(1130). 1931.

Malayalam Name : Vallimuthanga

Distribution : Pantropical

Erect, rhizomatous perennial herbs. Leaves many, linear, margins scabrid on the upper part; sheaths, purple-brown. Inflorescence a head of globose spikes along with 1-3 lateral spikes; terminal spike ovoid-globose or ellipsoid, lateral ones much smaller. Spikelets many, ovate-elliptic. Glumes distichous, boat-shaped. Nut, obovate or oblong, biconvex, brownish.

Flowering & Fruiting : July-November

Notes : It is a Medicinal and a Weed plant

175.*Fimbristylis aestivalis* Vahl, Enum. Pl. 2: 288. 1805, subsp. *aestivalis*; C.B.Clarke in Hook. f., Fl. Brit. India 6: 637. 1893; E. Vajr., Fl. Palghat Dist. 549. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 532. 2004. *Scirpus aestivalis* (Vahl) Retz., Observ. Bot. 4: 12. 1786.*Fimbristylis trimeni* Hook. f. in Trimen, Handb. Fl. Ceylon 5 (Suppl.): 52. 1900.*Fimbristylis aestivalis* (Retz.) Vahl subsp. *major* (Trimen) T.Koyama, Bot. Mag. (Tokyo) 87: 325. 1974 & in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 5: 313. 1985; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 532. 2004.

Distribution : Asia and Australia

Tufted, non-rhizomatous annual herbss. Leaves few, basal, margins incurved. Inflorescence laxly corymbose. Spikelets solitary, oblong, acute, greenish-brown. Glumes spiral, ovate, yellow-brownish, keeled, keel green, excurrent to straight or recurved cusp. Nut obovate, yellowish.

Flowering & Fruiting : January-April.

XXXV. DATISCACEAE

176.*Tetrameles nudiflora* R. Br. in Bennett, Pl. Jav. Rar. 79. t. 17. 1838; Hook. f., Fl. Brit. India 2: 627. 1879; Gamble, Fl. Pres. Madras 544(384). 1919; E. Vajr., Fl. Palghat Dist. 217. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 201. 2004.*Tetrameles grahamiana* Wight, Icon. Pl. Ind. Orient. t. 1956. 1853. **Tetramelaceae** (APG).

Malayalam Name : Chini, Cheeni, Cheenimaram, Vellapasa

Distribution : Paleotropics

Deciduous dioecious trees. Leaves simple, Alternate. Flowers yellowish-green. Male flowers subsessile, Female flowers sessile, in spicate pendulous panicles. Fruit a capsule, urceolate, faintly 8-ribbed, glandular, crowned by persistent calyx segments, opening at top; seeds minute, brown.

Flowering & Fruiting : March-May

XXXVI. DIOSCOREACEAE

177.*Dioscorea alata* L., Sp. Pl. 1033. 1753; Hook. f., Fl. Brit. India 6: 296. 1892; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1512(1056). 1928; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 407. 2004.*Dioscorea globosa* Roxb., Fl. Ind. 3: 797. 1832; Hook. f., Fl. Brit. India 6: 296. 1892. (Plate 10 A).

Malayalam Name : Kaachil, Kaavuth

Distribution : India (Endemic)

Twiners. Leaves opposite or rarely subopposite, broadly ovate or deltoid-ovate, winged. Male Spike on axillary branchlets, paniculate; rachis winged. Flowers; bracts deltoid-ovate; tepals widely ovate, obtuse. Female spike solitary in axils. Flowers laxly arranged, sessile. Capsule broadly obcordate.

Flowering & Fruiting : September-November

Notes : It is a Medicinal and an Edible plant.

178.*Dioscorea bulbifera* L., Sp. Pl. 1033. 1753; Hook. f., Fl. Brit. India 6: 296. 1892; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511(1055). 1928; E. Vajr., Fl. Palghat Dist. 507. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 407. 2004.*Helmia*

bulbifera (L.) Kunth, Enum. Pl. 5: 435. 1850.*Dioscorea bulbifera* L. var. vera Prain & Burkill, J. Asiat. Soc. Bengal 10: 26.1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511 (1055). 1928; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 407. 2004.

Malayalam Name : Kattukachil, Nukappa, Pannikizhangu

Distribution : Paleotropics

Twiners with tuberous root stocks. Leaves simple, opposite, ovate-suborbicular, base deeply cordate. Bulbils frequent in leaf axils and in inflorescence. Male flowers in slender, axillary panicled spikes. Perianth light green. Capsules oblong, 3-winged.

Flowering & Fruiting : September-October

Notes : It is a Medicinal plant

Herbarium:Coll.No.216.SCM/MTL/PTB/PKD,25.12.2022,Praveenkumar K.(Fl).

179.*Dioscorea esculenta* (Lour.) Burkill, Gard. Bull. Straits Settlem. 1: 396. 1917; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1510(1055). 1928; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 407. 2004.*Oncus esculentus* Lour., Fl. Cochinch. 194. 1790.*Dioscorea spinosa* Roxb. ex Hook. f., Fl. Brit. India 6: 291.1892.

Malayalam Name : Cherukizhangu, Natakizhangu

Distribution : Pantropical

Herbaceous twiners with tuberous root stocks; stem spiny often with purple colouration at the base, twining to the left. Leaves simple, Alternate, ovate-orbicular, glabrous; basally 7-9 nerved; petiole spinescent. Flowers are rarely formed.

180.*Dioscorea hispida* Dennst., Schluss. Hort. Malab. 33. 1818; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511(1055). 1928; E. Vajr., Fl. Palghat Dist. 508. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 408. 2004.*Dioscorea daemona* Roxb., Fl. Ind. 3: 805. 1832; Hook.f., Fl. Brit. India 6: 289. 1892.

Malayalam Name : Bolkande, Podava-kizhangu.

Distribution : South and South East Asia

Twiners. Leaf Alternate, digitate; leaflets subequal, obovate, abruptly sharply acuminate at apex, cuneate to the base, shortly petiolulate, ribs 5, prominent intercostae coarsely reticulate, thinly hispid; lateral leaflets gibbous at base. Panicles axillary, hispid. Racemes fascicled, shortly peduncled.

Flowering & Fruiting : September-October

181.*Dioscorea oppositifolia* L., Sp. Pl. 1033. 1753; Hook. f., Fl. Brit. India 6: 292. 1892; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1512(1056). 1928; E. Vajr., Fl. Palghat Dist. 508. 1990; SSasidh., Biodiv. Doc. Kerala- Fl. Pl. 408. 2004.*Dioscorea oppositifolia* L. var. linnaei Prain & Burkill, J. Asiat. Soc. Bengal 10: 30. 1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1512(1056). 1928.*Dioscorea oppositifolia* L. var. *dukhunensis* Prain & Burkill, J. Asiat. Soc. Bengal 10: 30. 1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1512(1056). 1928; Hook. f., Fl. Brit. India 6: 292. 1892.

Malayalam Name : Kachil.

Distribution : Indo-Malesia and China

Twiners. Leaves simple, opposite, elliptic, ovate or oblong, rounded or acute at base, 3-5 nerved, coriaceous. Spike slender, 3-6 together along the peduncle; bracts lanceolate. Male flowers: tepals ovate, obtuse. Stamens 6. Female flowers distant; tepals orbicular, glabrous. Capsule glabrous.

Flowering & Fruiting : August-November

Notes : It is a Medicinal plant.

182.*Dioscorea pentaphylla* L., Sp. Pl. 1032. 1753; Hook. f., Fl. Brit. India 6: 281. 1892; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511(1056). 1928; E. Vajr., Fl. Palghat Dist. 508. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 408. 2004.*Botryosicyos pentaphyllus* (L.) Hochst., Flora 27: 3. 1844.*Dioscorea pentaphylla* L. var. *communis* Prain & Burkill., J. Asiat. Soc. Bengal 10: 23. 1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1512(1056). 1928; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 408. 2004.*Dioscorea pentaphylla* L. var. *linnaei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 23. 1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511(1056). 1928.*Dioscorea*

pentaphylla L. var. *rheedei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 23. 1914; C.E.C. Fisch., in Gamble, Fl. Pres. Madras 1511(1056). 1928; E. Vajr., Fl. Palghat Dist. 509. 1990; Sasidh., Biodiv. Doc. Kerala.2004.

Malayalam Name : Nattakizhangu

Distribution : Indo-Malesia and China

Twiners. Leaves Alternate, 3-5-foliolate, with bulbils in the axils. Male flowers on slender spikes on axillary or terminal panicles, tomentose; tepals 6, greyish; outer ovate, tomentose, inner lanceolate, glabrous; stamens 3, staminodes 3. Female spike solitary, tomentose; tepals 6, biseriate, ovate; ovary oblong, ribbed; stigma capitate. Capsule oblong, 3-winged, glabrescent.

Flowering & Fruiting : September-December.

XXXVII. DIPTEROCARPACEAE

183.*Hopea parviflora* Bedd., Fl. Sylv. t. 7. 1869; Dyer in Hook. f., Fl. Brit. India 1: 308. 1874; Dunn in Gamble, Fl. Pres. Madras 82(59). 1915; E. Vajr., Fl. Palghat Dist. 74. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 44. 2004. (Plate 10 E).

Malayalam Name : Irumbagam, Kambagam, Thambagam.

Distribution : Southern Western Ghats (Endemic)

Evergreen trees. Leaves simple, Alternate, ovate, lanceolate or ovate-lanceolate, cordate or subcordate, coriaceous. Flowers bisexual, creamy yellow, in unilateral terminal and upper axillary, tomentose racemose panicles. Fruit a nut, terete, glabrous; wings, 8-10 nerved, glabrous.

Flowering & Fruiting : January-June

Notes : The wood hard and durable can be used in build construction, shipbuilding, etc. The bark is considered a good tanning material and is used for tanning especially good quality leather.

184.*Hopea ponga* (Dennst.) Mabb., Taxon 28: 587. 1979; E. Vajr., Fl. Palghat Dist. 74. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 45. 2004.*Artocarpus ponga* Dennst., Schluss. Hort. Malab. 15,18,30. 1818.*Hopea wightiana* Wall.ex Wight & Arn.,

Prodr. 85.1834; Dyer in Hook. f., Fl. Brit. India 1: 309.1874; Dunn in Gamble, Fl. Pres. Madras 82(59). 1915. (Plate 7 F).

Malayalam Name : Irumbakam, Kambakam, Pongu

Distribution : Southern Western Ghats (Endemic)

Evergreen trees. Leaves simple, Alternate¸ovate-lanceolate or ovate-oblong or ovate, glabrous. Flowers bisexual, yellowish-pink, in axillary unilateral drooping racemose panicles. Fruit a nut, ovoid; calyx lobes expanded to forms wings, dark red; 2 longer wings, 8-nerved, 3 smaller ones unequal.

Flowering & Fruiting : March-June

Herbarium:Coll.No.167.PKS/SKP/OTP/PKD, 25.12.2021.,Praveenkumar K.(Fl).

185.*Vateria indica* L., Sp. Pl. 513. 1753; Dyer in Hook. f., Fl. Brit. India 1: 313. 1874; Dunn in Gamble, Fl. Pres. Madras 85(61). 1915; E. Vajr., Fl. Palghat Dist. 75. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 45. 2004.*Vateria malabarica* Blume, Mus. Bot. Lugd.-Bat. 2: 29. 1852**.** (Plate 8 H).

Malayalam Name : Payin, Painimaram, Vellakundirikkam

Distribution : Western Ghats (Endemic)

Evergreen trees, bark greyish. Leaves simple, Alternate, oblong, glabrous, coriaceous. Flowers bisexual, white, fragrant, in terminal densely stellate puberulus panicles. Fruit a capsule, pale brown, ovoid or oblong-ovoid, lanceolate, tip acuminate; seed one.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant, The resin from the bark is used for making varnish and burned as incense. The wood is good for plywood. An oil obtained from the seeds is applied externally to relieve rheumatism.

Herbarium:Coll.No.58.ANK/TCK/MKD/PKD,12.08.2020,Praveenkumar K.(Fl).

XXXVIII. DRACAENACEAE

186.*Sansevieria roxburghiana* Schult. & Schult.f., Syst. Veg. 7: 357. Fl. 12D & E. 1829; Hook. f., Fl. Brit. India 6: 271. 1892; C.E.C. Fisch., in Gamble, Fl. Pres.

Madras 1520(1061). 1928; Sasidh., Fl. Parambikulam WLS 351. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 491. 2004.*Sansevieria zeylanica* Roxb., Pl. Coromand. t. 184. 1805, non (L.) Willd. 1799. **Asperagaceae** (APG).

Malayalam Name : Maran, Manji, Muramachi , Sarppapola

Distribution : Coromandel coast

Herbs. Leaves basal, sessile, subterete at base. Racemes; bracts lanceolate; flowers 3-5 in a cluster. Perianth lobes 6, greenish, tinged purple, 1-nerved, base tapering. Stamens attached near the middle of the perianth lobes. Ovary 3-celled, obovoid, ovule solitary in each cell, stigma simple. Berry globose.

Flowering & Fruiting : December-February

Notes : It is a Medicinal and an Exotic plant

XXXIX. EBENACEAE

187.*Diospyros montana* Roxb., Pl. Corom. t. 48. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 555. 1882; Gamble, Fl. Pres. Madras 776(545). 1923; Sasidh., Fl. Parambikulam WLS 182. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 271. 2004. *Diospyros cordifolia* Roxb., Pl. Corom. t. 50. 1795; Gamble, Fl. Pres. Madras 776(545). 1923. *Diospyros montana* Roxb. var. cordifolia (Roxb.) C.B. Clarke in Hook. f., Fl. Brit. India 3: 555. 1882.*Diospyros cordifolia* Roxb., Pl. Corom. t. 50. 1795; Gamble, Fl. Pres. Madras 776(545). 1923.

Malayalam Name : Bali, Manjakara, Nanchimaram

Distribution : Tropical Asia

Dioecious trees. Leaves simple, Alternate, ovate, ovate-oblong, elliptic-oblong obtuse, subcordate or acute,. Flowers white. Male flowers: 2-6 in axillary umbels. Female flowers: solitary. Fruit a berry, ovoid to obconical, yellow to orange, glaucous; calyx foliaceous, slightly enlarged, reflexed; seeds 3-6, rough, black; endosperm smooth.

Flowering & Fruiting : April-February

Notes : It is a Medicinal plant.

188.*Diospyros peregrina* (Gaertn.) Gurke in Engl. & Prantl, Naturl. Pflanzenfam. 4(1): 164. 1891; Gamble, Fl. Pres. Madras 777(546). 1921.*Embryopteris peregrina* Gaertn., Fruct. 145. 1788.*Diospyros malabarica* (Desr.) Kostel., Allg. Med. Pharm. Fl. 3: 1099. 1834; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 271. 2004.*Garcinia malabarica* Desr. in Lam., Encycl. 3: 701. 1792.*Diospyros embryopteris* Pers., Syn. 2: 624. 1807,p.p.; C.B. Clarke in Hook. f., Fl. Brit. India 3: 556. 1882.

Malayalam Name : Panachi, Panancha, Vananji

Distribution : Tropical Asia

Dioecious trees. Leaves simple, Alternate, distichous, oblong or oblong-lanceolate, glabrous. Flowers pale yellow. Male flowers: 2-7 in axillary, drooping cymes. Female flowers: usually solitary, axillary, drooping. pericarp thin, pulp viscid and glutinous; seeds 4-8, flattened, reddish-brown.

Flowering & Fruiting : March-May

Notes : It is a Medicinal plant. The exudates from fruit rind is used for conditioning drums, mridangam etc.

XL. ERYTHROXYLACEAE

189.*Erythroxylum monogynum* Roxb., Pl. Corom. t.88. 1798; Hook. f., Fl. Brit. India 1: 414. 1874; Dunn in Gamble, Fl. Pres. Madras 127(90). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 66. 2004. *Sethia indica* DC., Prodr. 1: 576. 1824.*Erythroxylum indicum* (DC.) Bedd., Fl. Sylv. t. 81. 1871.

Malayalam Name : Chembulinga, Vella-devadaram

Distribution : India, Myanmar and Sri Lanka

Large shrub to small trees. Leaves simple, Alternate, obovate or oblanceolate, base attenuate or cuneate. Flowers bisexual, axillary, solitary or 1-4 fascicles. Petals 5-6, white, oblong, reflexed, with an erect double ligule on inner side, imbricate. Fruit a drupe, obscurely angled, ellipsoid, red; seed one.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant

XLI. EUPHORBIACEAE

190.*Acalypha capitata* Willd., Sp. Pl. 4: 525. 1805. *Acalypha alnifolia* Klein ex Willd., Sp. Pl. 4: 525. 1805; Hook. f., Fl. Brit. India 5: 415. 1887; Gamble, Fl. Pres. Madras 1330(930). 1925; E.Vajr., Fl. Palghat Dist. 418. 1990. (Plate 9 B).

Distribution : Peninsular India (Endemic)

Shrubs, branchlets densely hispid. Leaves ovate, margin crenate to serrate. Male flowers in axillary cylindric spike, anthers vermiculiform, sessile; female spike, upper axillary, bracts cupular, dentate, enclosing the ovary, ovary densely tomentose. Fruits 3-lobed.

Flowering & Fruiting : October-March.

191.*Acalypha fruticosa* Forssk., Fl. Aeg.-Arab. 161. 1775; Hook. f., Fl. Brit. India 5: 415. 1887; Gamble, Fl. Pres.Madras 1331(931).1925;Sasidh., Fl. Parambikulam WLS 280. 2002.

Malayalam Name : Balamunja, Chini, Kuppameni, Sinnimaram

Distribution : Paleotropics

Erect profusely branched shrubs. Leaves simple, Alternate, ovate, aromatic. Spikes short, axillary, solitary, androgynous, long. Tepals tomentose, with sessile glands outside. Stamens many; anthers sub-globose to oblong. Female flowers below, sessile; bracts reniform, margin dentate; ovary; styles many. Capsules trilobed.

Flowering & Fruiting : July-August

Notes : It is a Medicinal plant.

192.*Acalypha indica* L., Sp. Pl. 1003. 1753; Hook. f., Fl. Brit. India 5: 416. 1887; Gamble, Fl. Pres. Madras 1330(930). 1925; Sasidh., Fl. Parambikulam WLS 280. 2002.

Malayalam Name : Kuppameni

Distribution : Indo-Malesia, Arabian Peninsula and Tropical Africa

Annual herbs. Leaves simple, Alternate, broadly ovate. Spikes axillary, long, monoecious. Male flowers above, ebracteate. Female flowers below, subtended by foliaceous, long. Capsules 3-valved, concealed by bract, hispid.

Flowering & Fruiting : July-December

Notes : It is a Medicinal and a Weed plant.

Herbarium:Coll.No.119.PNK/KVR/CTR/PKD,25.03.2021,Praveenkumar K.(Fl).

193.*Antidesma acidum* Retz., Obs. Bot. 5: 30. 1788; E. Vajr., Fl. Palghat Dist. 420. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 408. 2004.*Antidesma diandrum* (Roxb.) Spreng., Syst. Veg. 1: 826.1825; Hook. f., Fl. Brit. India 5: 361. 1887; Gamble, Fl. Pres. Madras 1298(908). 1925.

Malayalam Name : Asaripuli.

Distribution : Indo-Malesia and South China

Large shrubs. Leaves simple, Alternate, elliptic or obovate. Spikes terminal, single or 2-branched. Tepals greenish-yellow; lobes 4, brown hairy within. In male flowers stamens 2, attached in depressions on the disc. In female flowers ovary obovoid, 1-loculed; ovules 2. Drupe globose.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant. Leaves used as substitute for tamarind Fruits are edible and leaves are used in curry.

194.*Aporosa cardiosperma* (Gaertn.) Merr., J. Arnold Arbor. 35: 139. 1954; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 310. 2007.*Croton cardiospermus* Gaertn., Fruct. Sem. Pl. 2: 120. 1790.*Scepa lindleyana* Wight, Icon. Pl. Ind. Orient. t. 361. 1840.*Aporosa lindleyana* (Wight) Baill., Etud. Gen. Euphorb. 645. 1858; Hook. f., Fl. Brit. India 5: 349. 1887; Gamble, Fl. Pres. Madras 1309(916). 1925 E.Vajr., Fl. Palghat Dist. 421. 1990. **Phyllanthaceae** (APG).

Malayalam Name : Aechil, Eachil, Kotili, Ponvetti, Vetti

Distribution : Peninsular India and Sri Lanka

Evergreen trees. Leaves simple, attenuate, bifarious, elliptic-oblong, elliptic, oblong. Male flowers: yellow, solitary or clustered in axillary spikes. Female flowers: pale green, 3-8 together, in densely tomentose small racemes; pedicellate. Fruit a capsule globose, yellow, glabrous, pointed with the style; seed one, brown, planoconvex; aril orange-yellow.

Flowering & Fruiting : December-June

Notes : It is a Medicinal plant. The fruits are edible. A decotion of root is said to cure jaundice, fever, headache, insanity and seminal loss. The timber is useful for building purpose like rafter, etc.

195.*Breynia androgyna* (L.) Chakrab. & N.P. Balakr., Bangladesh J. Plant Taxon. 19(2): 120. 2012.*Sauropus androgynus* (L.) Merr., Bull. Bur. Forest. Philipp. Islands 1: 30. 1903; Gamble, Fl. Pres. Madras 1303(911). 1925; E.Vajr., Fl. Palghat Dist. 438. 1990; *Clutia androgyna* L., Mant. Pl. 1: 128. 1767.*Sauropus albicans* Blume, Bijdr. 596. 1826; Hook. f., Fl. Brit. India 5: 332. 1887.*Sauropus indicus* Wight, Icon. Pl. Ind. Orient. t. 1952. f. 2.1853. **Phyllanthaceae** (APG).

Malayalam Name : Elakeera, Velicheera

Distribution : Tropical & Subtropical Asia

Erect monoecious shrubs. Leaves simple, Alternate, triangular-lanceolate. Flowers axillary, solitary to clustered. Perianth 1-seriate, 6-lobed. Stamens 3, filaments connate to a column. Ovary globose, 3-celled; ovules 2 in each cell; style 3; stigma curved. Capsules globose, with persistent stylar portion at tip.

Flowering & Fruiting : August-December

Notes : It is a Medicinal, an Exotic and an Edible plant.

196.*Breynia quadrangularis* (Klein ex Willd.) Chakrab. & N.P. Balakr., Bangladesh J. Plant Taxon. 19(2): 121. 2012.*Sauropus quadrangularis* (Willd.) Muell.Arg., Linnaea 32: 73. 1863; Hook. f., Fl. Brit. India 5: 335. 1887; Gamble, Fl. Pres. Madras 1303(911). 1925; E.Vajr., Fl. Palghat Dist. 438. 1990. *Phyllanthus quadrangularis* Willd., Sp. Pl. 4: 585. 1805. **Phyllanthaceae**(APG).

Malayalam Name : Aruni, Punarmuringa

Distribution : India, Sri Lanka, China and Indo-China

Glabrous slender branched shrubs. Leaves simple, Alternate, ovate-obtuse, emarginate at apex. Flowers solitary, axillary. Male flowers; sepals ovate, acute. Capsule depressed globose, smooth, glabrous; cocci, trigonous with rounded back side and acute faces, smooth.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant.

197.*Bridelia retusa* (L.) A. Juss., Euphorb. Gen. 109. 1824; Hook. f., Fl. Brit. India 5: 268. 1887p.p.; Gamble, Fl. Pres. Madras 1280(896). 1925; E. Vajr., Fl. Palghat Dist. 423. 1990. *Clutia retusa* L., Sp. Pl. 1475. 1753.*Bridelia spinosa* (Roxb.) Willd., Sp. Pl. 4: 979.1806.*Bridelia crenulata* Roxb., Fl. Ind. 3: 734. 1832.*Bridelia roxburghiana* (Muell.Arg.) Gehrm., Bot. Jahrb. Syst. 41. 95: 30. 1908; Gamble, Fl. Pres. Madras 1280(896). 1925.*Bridelia airy-shawii* P.T. Li, Acta Phyt. Sin. 20: 117. 1982, nom. Illeg. **Phyllanthaceae** (APG).

Malayalam Name : Kaini, Mulluvenga, Mullankkayini

Distribution : Indo-Malesia and China

Deciduous trees. Leaves simple, Alternate, broadly elliptic. Flowers unisexual; greenish-yellow, sessile or shortly pedicellate, crowded in dense axillary or terminal, sometimes paniculate spikes; bracts scaly. Fruit a drupe, purplish-black, seated on the persistent, slightly enlarged calyx, pyrenes 2, epicarp crustaceous; seed one in each pyrene.

Flowering & Fruiting : August-December

Herbarium:Coll.No.197.EPN/KVR/CTR/PKD,21.03.2022.,Praveenkumar K.(Fl).

198.*Breynia vitis-idaea* (Burm. f.) C.E.C. Fisch., Bull. Misc. Inform. Kew 1932: 65. 1932; E. Vajr., Fl. Palghat Dist. 423. 1990. *Rhamnus vitis-idaea* Burm. f., Fl. Ind. 61. 1768.*Breynia rhamnoides* (Retz.) Muell.Arg. in DC., Prodr. 15: 440. 1866; Hook. f., Fl. Brit. India 5: 330. 1887; Gamble, Fl. Pres. Madras 1304(912). 1925.*Phyllanthus rhamnoides* Retz., Obs. Bot. 5: 30. 1788.*Melanthesa rhamnoides* (Retz.) Wight, Icon. Pl. Ind. Orient. t. 1898, fig. 1. 1852. **Phyllanthaceae** (APG).

Malayalam Name : Chuvannaniruri, Pavalapulla, Pavilapoola

Distribution : Indo-Malesia and China

Large shrubs. Leaves simple, Alternate, ovate or elliptic. Male flowers in axillary fascicles of 2-5; perianth turbinate, yellow. Female flowers axillary, solitary, reddish. Fruit globose, red on ripening, changes to purple.

Flowering & Fruiting : February-August

Notes : It is a Medicinal plant.

Herbarium:Coll.No.192.EKK/KGD/CTR/PKD,25.02.2022,Praveenkumar K.(Fl).

199.*Breynia retusa* (Dennst.) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204. 1929; Manilal, Fl. Silent Valley 246. 1988; E.Vajr., Fl. Palghat Dist. 422. 1990; Sasidh., Fl. Parambikulam WLS 283. 2002.*Phyllanthus retusus* Dennst., Schluss. Hort. Malab. 24. 1818.*Breynia patens* (Roxb.) Rolfe, J. Bot. 11: 359. 1882; Hook. f., Fl. Brit. India 5: 329. 1887; Gamble, Fl. Pres. Madras 1304(912). 1925.*Phyllanthus patens* Roxb., Fl. Ind. 3: 667. 1832.*Melanthesa turbinata* Wight, Icon. Pl. Ind. Orient. t. 1897. 1852. **Phyllanthaceae** (APG).

Malayalam Name : Aattucherukola, Ekdania, Peruneeroli

Distribution : Sri Lanka to Indo-China

Shrubs. Leaves simple, Alternate, broadly elliptic or ovate. Flowers unisexual, solitary, axillary. Male flowers; perianth turbinate, truncate. Female flowers ; perianth campanulate, 5-6-lobed. Capsule depressed globose, orange-red on ripening, subtended by the enlarged fruiting perianth.

Flowering & Fruiting : February-September

200.*Bridelia stipularis* (L.) Blume, Bijdr. 597. 1825; Hook. f., Fl. Brit. India 5: 270. 1887; Gamble, Fl. Pres. Madras 1281(896). 1925.*Clutia stipularis* L., Mant. Pl. 1: 127. 1767.*Clutia scandens* Roxb., Pl. Corom. t. 173. 1802.*Bridelia scandens* (Roxb.) Willd., Sp. Pl. 4: 979. 1805; Gamble, Fl. Pres. Madras 1281(896). 1925; E. Vajr., Fl. Palghat Dist. 424. 1990. **Phyllanthaceae** (APG).

Malayalam Name : Cheruka, Cherupanachi.

Distribution : Tropical & Subtropical Asia

Scandent shrubs with spines on older stem. Leaves simple, Alternate, elliptic-oblong. Flowers greenish-yellow, sessile, in axillary fascicles. Male flowers Female flowers, Tepals biseriate, ovate-acute, densely tomentose without. Drupe globose, black, calyx persistent.

Flowering & Fruiting : December-February

Notes : It is a Medicinal plant, fruits eaten

Herbarium:Coll.No.104.PKM/CVA/OTP/PKD,20.02.2021,PraveenkumarK.(Fl).

201.*Cleistanthus collinus* (Roxb.) Benth. ex Hook. f., Fl. Brit. India 5: 274. 1887; Gamble, Fl. Pres. Madras 1282(897). 1925; E. Vajr., Fl. Palghat Dist. 425. 1990. *Clutia collina* Roxb., Pl. Corom. t.169. 1802. **Phyllanthaceae** (APG). (Plate 17 D).

Malayalam Name : Odugu, Odaku.

Distribution : South Asia

Deciduous trees. Leaves simple, Alternate, distichous; elliptic, suborbicular, obovate or acute. Flowers unisexual, yellowish-green, in glomerules borne on main leafy branches and short lateral branchlets. Fruit a capsule, subglobose or wide oblong, truncate at apex, shallowly 3 lobed, glossy, glabrous, pale brown; seeds 3, globose, black.

Flowering & Fruiting : December-November

Notes : It is a Poison plant

Herbarium: Coll.No.88.CSS/SKP/OTP/PKD, 21.01.2021., Praveenkumar K.(Fl).

202.*Drypetes sepiaria* (Wight & Arn.) Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Phyllanthoid.-Phyllanth. 271. 1922. *Hemicyclia sepiaria* Wight & Arn., Edinb. New Phil. J. 14: 297. 1833; Hook. f., Fl. Brit. India 5: 337. 1887; Gamble, Fl. Pres. Madras 1299(909). 1925. **Phyllanthaceae** (APG).

Malayalam Name : Veeramaram, Vellakasavu

Distribution : Peninsular India and Sri Lanka

Evergreen trees. Leaves simple, ovate, elliptic, ovate-oblong, or orbicular, glabrous. Flowers unisexual, yellowish, in axillary clusters. Fruit a drupe globose, glabrous, red; epicarp wrinkled; seed 1, arillate.

Flowering & Fruiting : January-April.

203.*Euphorbia hirta* L., Sp. Pl. 454. 1753; Gamble, Fl. Pres. Madras 1275(892). 1925; E. Vajr., Fl. Palghat Dist. 428. 1990. *Chamaesyce hirta* (L.) Millisp., Publ. Field Columbian Mus. Bot. Ser. 2: 303. 1909.

Malayalam Name : Attuvattappala, Kuzhinagappala, Nilappala

Distribution : Native of Tropical America; now Pantropical

Slender, erect, pubescent herbs. Leaves opposite, broadly oblong to elliptic-lanceolate. Cyathia aggregated in single or paired axillary clusters. Involucre minute; glands 5, red. Male flowers 4-6, ebracteolate. Female florets laterally pendulous; styles 2-fid from base. Capsule pubescent; seeds minute, red, minutely furrowed.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, an Exotic and a Weed plant

Herbarium:Coll.No.61.KNT/LPR/OTP/PKD, 25.10.2020., Praveenkumar K.(Fl).

204.*Euphorbia thymifolia* L., Sp. Pl. 454. 1753; Hook. f., Fl. Brit. India 5: 252. 1887; Gamble, Fl. Pres. Madras 1276(893). 1925; E. Vajr., Fl. Palghat Dist. 429. 1990. *Chamaesyce thymifolia* (L.) Millsp., Publ. Field Columbian Mus. Bot. Ser. 2: 412. 1916.

Malayalam Name : Chitrapala, Nilappala

Distribution : Native of Tropical & Subtropical America

Softly hispid prostrate herbs. Leaves opposite, distichous, oblong or suborbicular. Cyathia in axillary clusters. Involucre campanulate; glands 4. Male flowers 1-4, ebracteolate. Female laterally pendulous; ovary tomentose; style 3-forked from base. obtusely angled, glabrescent; seeds 4-angular, minutely tuberculate, red.

Flowering & Fruiting : November-May

Notes : It is a Medicinal and a Weed plant

Herbarium: Coll.No.62.PAT/LPR/OTP/PKD, 29.10.2020., Praveenkumar K.(Fl).

205.*Euphorbia tithymaloides* L., Sp. Pl. 453. 1753.*Pedilanthus tithymaloides* (L.) Poir., Ann. Mus. Natl. Hist. Nat. Paris 19: 390, t. 19. 1812; Hook. f., Fl. Brit. India 5: 239. 1887; Gamble, Fl. Pres. Madras 1346(942). 1925.

Malayalam Name : Thathammapoochedi

Distribution : Native to Mexico to Tropical America; now naturalised in India

Erect subshrubs; branchlets zigzag, latex milky. Leaves Alternate, elliptic-ovate, variegated, deciduous. Cyathia terminal, cymose, subtended by petaloid, pink bracts; glands 4, unequal; appendages and perianth absent. Male florets c. 25. Female single; ovary 3-locular; ovule 1 per locule. Capsule of 3 bivalved cocci.

Flowering & Fruiting : April-August

Notes : It is a Medicinal, an Exotic and a Garden plant.

206.*Flueggea leucopyrus* Willd., Sp. Pl. 4: 757. 1806; Hook. f., Fl. Brit. India 5: 328. 1887; Gamble, Fl. Pres. Madras 1296(907). 1925.*Securinega leucopyrus* (Willd.) Muell.Arg. in DC., Prodr. 15: 451. 1866; K.N. Subram., Fl. Thenmala Div. 335. 1995; Sasidh., Fl. Chinnar WLS 290. 1999. **Phyllanthaceae** (APG)

Malayalam Name : Ampooripaccha, Amboorippachila, Mulpulanji,

Distribution : Paleotropics

Shrubs, branchlets angular ending in spines. Leaves distichous, obovate,. Flowers greenish-white in axillary clusters; bracts many, minute. Male flowers: tepals concave, obtuse; stamens 5, filaments pistillode. Female flowers; tepals 5, ovate, style 3-fid, recurved and spreading; stigma sessile. Capsule globose, white, 3-valved; seeds 3, triquetrous.

Flowering & Fruiting : June-September.

207.*Flueggea virosa* (Roxb. ex Willd.) Voigt, Hort. Suburb. Calcutt. 152. 1845; Gamble, Fl. Pres. Madras 1296(907). 1925; E. Vajr., Fl. Palghat Dist. 439. 1990.*Phyllanthus virosus* Roxb. ex Willd., Sp. Pl. 4: 578. 1805.*Flueggea microcarpa* Blume, Bijdr. 580. 1826; Hook. f., Fl. Brit. India 5: 328. 1887. **Phyllanthaceae** (APG).

Malayalam Name : Koorambal, Perimklavu, Vellapoolam

Distribution : Tropical Africa, Asia and Australia

Profusely branched dioecious shrubs. Leaves Alternate, obovate. Flowers minute in axillary clusters, short-pedicelled. Male flowers numerous; tepals 5, ovate-concave, crenulate; stamens 5, free; pistillodes 3. Female flowers; tepals 5, ovate. Fruit green, become white when mature, globose.

Flowering & Fruiting : March-September

Notes : It is a Medicinal plant.

208.*Jatropha gossypiifolia* L., Sp. Pl. 1006. 1753; Hook. f., Fl. Brit. India 5: 383. 1887; Gamble, Fl. Pres. Madras 1340(937). 1925; E. Vajr., Fl. Palghat Dist. 431. 1990.*Jatropha glandulifera* sensu Manilal & Sivar., Fl. Calicut 258. 1982; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 224. 2007, non Roxb. 1832

Malayalam Name : Chuvannakadalavanakku, Seemayavanakku

Distribution : Mexico to South America & Caribbean Islands

Shrubs, purplish green and glandular hairy on younger parts. Leaves simple, Alternate, in close spiral, orbicular-cordate, margin with gland-tipped hairs. Flowers red with yellow centre, unisexual in axillary and terminal monoecious corymbose cymes; bracts linear-lanceolate, glandular-hairy. Male perianth lobes free, biseriate, reddish-brown, lanceolate, obovate, villous at base within. Stamens 8-10. Female tepals 5. Stamens 8, biseriate. Disc lobes obtrapezoid, convex, thick, in female flowers Ovary 3-celled; ovules solitary in each; styles 3, connate below. Capsule; seeds oblong, caruncle multifid.

Flowering & Fruiting : July-September

Notes : It is an Exotic and a Weed plant. Paste of leaves is applied to boils and skin diseases (eczema).

209.*Macaranga indica* Wight, Icon. Pl. Ind. Orient. t. 1883. 1852; Hook. f., Fl. Brit. India 5: 446. 1887; Gamble, Fl. Pres. Madras 1326(927). 1925; E. Vajr., Fl. Palghat Dist. 432. 1990.

Malayalam Name : Malavetta, Puthatamara, Vatta, Vattakkanni

Distribution : South and South East Asia

Gregarious trees. Leaves simple, Alternate, glabrous above and tawny-pubescent. Flowers unisexual, yellow, in axillary panicles having zig-zag branches. Male flowers: tepals 3, initially connate, later spreading. Female flowers: tepals lanceolate, valvate, acute, glandular; ovary superior, globose, echinate, ovules one in each cell; style lateral; stigma acute. Fruit a capsule, globose, echinate; seeds black.

Flowering & Fruiting : October-December.

210.*Macaranga peltata* (Roxb.) Muell.Arg. in DC., Prodr. 15: 1010. 1866; Gamble, Fl. Pres. Madras 1326(928). 1925; E. Vajr., Fl. Palghat Dist. 432. 1990. *Osyris peltata* Roxb., Fl. Ind. 3: 755. 1832.*Mappa peltata* (Roxb.) Wight, Icon. Pl. Ind. Orient. t. 817. 1844-45.*Macaranga roxburghii* Wight, Icon. Pl. Ind. Orient. t. 1949, f.4. 1853; Hook. f., Fl. Brit. India 5: 448. 1887.*Macaranga tomentosa* Wight, Icon. Pl. Ind. Orient. t. 1949, f.1. 1853.

Malayalam Name : Uppila, Uppothy, Podunni.

Distribution : India, Sri Lanka Cambodia, Laos, Myanmar, Thailand and VietNam

Dioecious trees. Leaves simple, Alternate, glabrous or glabrescent, pubescent with reddish glands beneath. Flowers greenish-yellow. Fruit a capsule, globose, hairy, glandular, black; seed one, black.

Flowering & Fruiting : January-February

Notes : It is a Medicinal plant. Wood is used for pencil and match boxes.

Herbarium:Coll.No.25.PKT/AKR/PTB/PKD, 18.02.2020., Praveenkumar K.(Fl).

211.*Mallotus philippensis* (Lam.) Muell.Arg., Linnaea 34: 196. 1865; Hook. f., Fl. Brit. India 5: 442. 1887, "philippinensis"; Gamble, Fl. Pres. Madras 1322(924). 1925; E. Vajr., Fl. Palghat Dist. 433. 1990. *Croton philippensis* Lam., Encycl. 2: 206. 1786.*Mallotus philippensis* (Lam.) Muell.Arg. var. *tomentosus* Gamble, Fl. Pres. Madras 1322(924). 1925.

Malayalam Name : Sindooram, Thavatta

Distribution : Indo-Malesia and Australia

Dioecious trees. Leaves simple, Alternate, glabrous above, greyish pubescent to fulvous tomentose with minute red glands beneath. Flowers unisexual, brick red, in rusty puberulous, terminal spicate panicles. Fruit a capsule, globose, densely red-glandular, pubescent; seeds globose, glabrous, black.

Flowering & Fruiting : October-March

Notes : It is a Medicinal plant

Herbarium:Coll.No.130.CST/TVP/PTB/PKD, 25.04.2021., Praveenkumar K.(Fl).

212.*Mallotus repandus* (Willd.) Muell.Arg., Linnaea 34: 197.1805; Hook. f., Fl. Brit. India 5: 442.1887; Gamble, Fl. Pres. Madras 1321(924). 1925.*Croton repandus* Willd. in Neue Schriff. Freunde Berlin 4: 206. 1803.

Malayalam Name : Thavatti

Distribution : Indo-Malesia to Pacific Islands

Large scandent or subscandent shrubs with thorns on the trunk. Leaves simple, Alternate, glabrescent above. Male flowers in terminal panicled racemes; suborbicular or lanceolate, glandular within; stamens many. Female flowers green, in simple racemes; ovary 2-lobed, tomentose, 2-celled; stigma plumose. Capsule 1, 2-valved, densely fulvous-tomentose and glandular without; seeds subglobose, black.

Flowering & Fruiting : November-January.

213.*Manihot carthagenensis* subsp. glaziovii (Muell.Arg.) Allem, Novon 11: 160. 2001.*Manihot glaziovii* Muell.Arg. in Mart., Fl. Bras. 11: 471. 1874; Gamble, Fl. Pres. Madras 1346(942). 1925; E. Vajr., Fl. Palghat Dist. 440. 1990. (Plate 17 C).

Distribution : Native of South America; introduced in India.

Trees. Leaves Alternate, peltate; broadly elliptic to obovate. Inflorescence lax, usually single or few together. Male flowers: perianth divided to more or less halfway, greenish-white to dark purplish inside at base. Female flowers: perianth green tinged with reddish; ovary smooth. Capsule globose, warty, without wings; seeds; caruncle yellow.

Flowering & Fruiting : October-January

Notes : It is an Exotic and a Poison plant.

214.*Manihot esculenta* Crantz., Inst. Rei. Herb. 1: 167. 1766; E. Vajr., Fl. Palghat Dist. 440. 1990.*Jatropha manihot* L., Sp. Pl. 1007. 1753.*Manihot utilissima* Phol., Pl. Bras. Ic. 1: 32. 1827; Hook. f., Fl. Brit. India 5: 239. 1887; Gamble, Fl. Pres. Madras 1346(942). 1925. (Plate 15 B).

Malayalam Name : Maracheeni, Kappa, Poolakizhangu

Distribution : Native of South America; now common throughout the tropics

Shrubs; stem with prominent petiolar scars. Leaves Alternate, palmately lobed; oblanceolate. Inflorescence lax, 3-5 together in fascicles. Male flowers: perianth divided to halfway or more, greenish-white with reddish-white bands inside. Female flowers. Capsule, subglobose, 3-winged when young, smooth later. .

Flowering & Fruiting : December-March

Notes : It is an Exotic plant.

215.*Microstachys chamaelea* (L.) Muell.Arg., Linnaea 32: 95. 1863.*Tragia chamaelea* L., Sp. Pl. 981. 1753.*Sebastiana chamaelea* (L.) Muell.Arg. in DC., Prodr. 15: 1175. 1866; Hook. f., Fl. Brit. India 5: 475. 1888; Gamble, Fl. Pres. Madras 1344(940). 1925; E. Vajr., Fl. Palghat Dist. 438. 1990.

Malayalam Name : Kodiyavannakku, Njettavanakku

Distribution : Paleotropics

Erect or diffuse herbs. Leaves simple, Alternate, oblong-lanceolate. Flowers in monoecious slender axillary spikes. Male flowers in clusters of 3; tepals 5, connate; stamens 2-4, anthers globose. Female flowers solitary at base of spike; tepals 3, ovate; ovary 3-lobed, echinate without; ovule 1 in each cell; style 3, connate at base. Capsule 3-lobed each with two rows of soft prickles on the back; seeds oblong, carunculate.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant.

216.*Phyllanthus amarus* Schum. & Thonn. in C.F. Schumacher, Besk. Guin. Pl. 421. 1827; E. Vajr., Fl. Palghat Dist. 435. 1990. *Phyllanthus fraternus* auct. non Webster 1955.*Phyllanthus niruri* sensu Hook. f., Fl. Brit. India 5: 298. 1887, non L. 1753; Gamble, Fl. Pres. Madras 1290(903). 1925. **Phyllanthaceae** (APG).

Malayalam Name : Keezhanelli, Keezharnelli.

Distribution : Tropics

Erect herbs tall. Leaves simple, oblong, lower surface glaucous; stipules lanceolate, scarious. Male flowers towards tip of branchlets, solitary, axillary; tepals 5, ovate; stamens 3, exserted; filaments connate; disc of 5 glands. Female flowers; tepals 5, oblong; ovary globose; style erect, recurved. Capsule globose; seeds 6, trigonous, vertically muriculate.

Flowering & Fruiting : July-October

Notes : It is a Medicinal plant

Herbarium:Coll.No.219.KMP/KPZ/MKD/PKD,29.12.2022,PraveenkumarK.(Fl)

217.*Phyllanthus emblica* L., Sp. Pl. 982. 1753; Hook. f., Fl. Brit. India 5: 289. 1887; E. Vajr., Fl. Palghat Dist. 436. 1990. *Emblica officinalis* Gaertn., Fruct. 2: 122. 1791; Gamble, Fl. Pres. Madras 1295(906). 1925. **Phyllanthaceae** (APG). (Plate 5 C).

Malayalam Name : Amalakam, Nelli

Distribution : Throughout the tropics

Deciduous trees. Leaves simple, Alternate, bifarious on short deciduous branchlets, closely overlapping, subsessile. Flowers unisexual, greenish-yellow, axillary, densely clustered. Fruit a capsule, subglobose, dehiscing into 6 cocci, disc enlarged to give an appearance of fleshy yellowish-green, indehiscent berry.

Flowering & Fruiting : July-February

Notes : It is a Medicinal and an Edible plant. Horticultural varieties with large fruits are often cultivated in homesteads. Fruits are edible. The fruit is rich natural source of Vitamin C. The fruit is the main ingredient of chyavanparash, a brain tonic and Thriphala. The fruit is used to make pickles.

Herbarium:Coll.No.75.ASK/TCK/MKD/PKD,18.12.2020.,Praveenkumar K.(Fl).

218.*Phyllanthus reticulatus* Poir. in Lam., Encycl. 5: 298. 1804; Hook. f., Fl. Brit. India 5: 288. 1887. *Kirganelia reticulata* (Poir.) Baill., Etud. Gen. Euphorb. 613. 1858; Gamble, Fl. Pres. Madras 1294(905). 1925; E. Vajr., Fl. Palghat Dist. 432. 1990.*Anisonema multiflora* Wight, Icon. Pl. Ind. Orient. t. 1899. 1852. **Phyllanthaceae** (APG).

Malayalam Name : Neeroli.

Distribution : Tropical & Subtropical Asia to Australia

Scandent shrubs. Leaves simple, Alternate, elliptic. Male flowers in axillary fascicles; tepals 5, unequal, obovate, imbricate; stamens 5, outer 2-3 free, inner connate. Female flowers solitary; tepals 5, shortly connate, obovate, valvate, margin scarious; ovary globose, 5-12-locular; styles 3, bifid. Fruits globose, black; seeds 8-10, trigonous.

Flowering & Fruiting : August-December.

219.*Phyllanthus urinaria* L., Sp. Pl. 982. 1753; Hook. f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Pres. Madras 1289(902). 1925; E. Vajr., Fl. Palghat Dist. 437. 1990. *Phyllanthus leprocarpus* Wight, Icon. Pl. Ind. Orient. t. 1895. f. 4. 1852. **Phyllanthaceae** (APG).

Malayalam Name : Chirukizhukanelli, Chuvannakizhanelli

Distribution : Tropical & Subtropical Asia to Australia; now a Circumtropical weed

Erect herbs. Leaves simple, Alternate, base oblique, margin ciliate. Male flowers in axillary clusters. Female flowers in lower axils, solitary. Capsule globose, 3-lobed, sessile, verrucose; seeds 6, trigonous, transversely ridged.

Flowering & Fruiting : July-October

Notes : It is a Medicinal and an Exotic plant

Herbarium:Coll.No.128.PKM/CVA/MKD/PKD,17.04.2021,Praveenkumar K.(Fl).

220.*Phyllanthus virgatus* G.Forst., Ins. Austr. Prod. 65. 1786, var. *virgatus*; Manilal & Sivar., Fl. Calicut 264. 1982; E. Vajr., Fl. Palghat Dist. 437. 1990. *Phyllanthus simplex* Retz., Obs. Bot. 5: 29. 1788; Hook. f., Fl. Brit. India 5: 295. 1887; Gamble, Fl. Pres. Madras 1289(902). 1925.*Phyllanthus oblongifolia* Wight, Icon. Pl. Ind. Orient. t. 1902, f.1. 1852.*Phyllanthus narayanswamii* Gamble, Bull. Misc. Inform. Kew 1925: 329. 1925 & Fl. Pres. Madras 1289(902). 1925; Sasidh., Fl. Periyar Tiger Reserve 378. 1998; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 379. 2007. **Phyllanthaceae** (APG).

Distribution : Indo-Malesia to Polynesia and China

Erect or diffuse herbs with woody root stock. Leaves Alternate, narrowly oblong. Flowers solitary, axillary. Male flowers minute, subsessile; tepals 5, orbicular; stamens 3; filaments nearly free. Female flowers on long, filiform pedicels; tepals 6, oblong, acute; styles 3, spreading; disc saucer-shaped, wavy. Capsule depressed-globose, verrucose; seeds minutely tubercled.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant.

221.*Putranjiva roxburghii* Wall., Tent. Fl. Nap. 61. 1826; Hook. f., Fl. Brit. India 5: 336. 1887; Gamble, Fl. Pres. Madras 1311(917). 1925.*Drypetes roxburghii* (Wall.) Hurusawa, J. Fac. Sci. Univ. Tokyo, Sect. 3. Bot. 6: 337. 1954; Manilal, Fl. Silent

Valley 248. 1988; Sasidh., Fl. Parambikulam WLS 288. 2002. **Putranjivaceae** (APG). (Plate 3 H).

Malayalam Name : Ekkoli, Erenji, Poothilanji, Puthrajeevi

Distribution : Tropical Asia

Trees. Leaves simple, Alternate, elliptic-oblong. Flowers unisexual, small, yellow. Male flowers: sessile, in axillary spikes. Female flowers: solitary or in 2 or 3, axillary; pedicel puberulous; stigma crescent-shaped, glandular. Fruit a drupe, ovoid-ellipsoid, white tomentose; seed one, crustaceous; pedicels.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant. The tree is believed to give long life for sons and wear the fruit as necklace, hence the name given to the plant as putranjiva.

Herbarium:Coll.No.168.CTV/VPZ/PTB/PKD,25.12.2021., Praveenkumar K.(Fl).

222.*Ricinus communis* L., Sp. Pl. 1007. 1753; Hook. f., Fl. Brit. India 5: 457. 1887; Gamble, Fl. Pres. Madras 1335(933). 1925; E. Vajr., Fl. Palghat Dist. 440. 1990. (Plate 13 G).

Malayalam Name : Aavannakku, Chittavanakku.

Distribution : Native of Tropical Africa; now cultivated throughout tropics

Monoecious, branched glaucous shrubs. Leaves Alternate, margin coarsely serrate. Flowers in terminal paniculate racemes, pale yellow, male flowers below, female ones above. Capsule 3-lobed, prickly; seeds oblong, smooth, marbled, carunculate.

Flowering & Fruiting : May-June

Notes : It is a Medicinal, an Exotic and a Poison plant.

Herbarium:Coll.No.110.PBK/KVS/ALT/PKD,27.02.2021.,Praveenkumar K.(Fl).

223.*Tragia involucrata* L., Sp. Pl. 980. 1753; Hook. f., Fl. Brit. India 5: 465. 1888,p.p.; Gamble, Fl. Pres. Madras 1332(931). 1925; Sasidh., Fl. Parambikulam WLS 299. 2002. (Plate 17 A).

Malayalam Name : Choriyanam, Kodithoova, Kodithumba

Distribution : Indian Subcontinent

Slender, twining herbs with stinging hairs. Leaves simple, Alternate, ovate or elliptic, hispidulous on both sides. Spikes axillary, monoecious; male flowers above, female flowers at the base.. Capsule, 3-lobed, hispid; seeds globose.

Flowering & Fruiting : July-December

Notes : It is a Medicinal and a Poison plant

Herbarium:Coll.No.76.CTV/KND/PKD/PKD,18.12.2020.,Praveenkumar K.(Fl).

224.*Tragia montana* (Thwaites) Muell.Arg., Linnaea 34: 183. 1856 & in DC., Prodr. 15: 944. 1866; N.P. Balakr. & Chakrab., Rheedea 16: 20. 2006 & Fam. Euphorbiaceae India 182. 2007; *Tragia involucrata* L. var. cordata Muell.Arg. in DC., Prodr. 15: 943. 1866; Hook. f., Fl. Brit. India 5: 465. 1888.*Tragia muelleriana* Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Plukenetiin.-Epiprinin.-Ricinin. 80. 1919; Gamble, Fl. Pres. Madras 1332(932). 1925; E. Vajr., Fl. Palghat Dist. 439. 1990.

Distribution : India and Sri Lanka

Slender twiners. Leaves Alternate, ovate-cordate to suborbicular, to ovate-elliptic. Racemes terminal and leaf opposed with 1 or 2 female flowers at the base and several male towards the distal portion. Male flowers, ovate to suborbicular. Female flowers ovate, fimbriate; ovary subglobose, 3-lobed, densely hispid. Capsule depressed globose. seeds 3, globose.

Flowering & Fruiting : August-January.

XLII. FABACEAE

225.*Abrus precatorius* L.,Syst. Nat. (ed.12) 2: 472.1767; Baker in Hook. f., Fl. Brit. India 2: 175.1876; Gamble, Fl. Pres. Madras 349(247). 1918 Sasidh., Fl. Parambikulam WLS 83. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 115. 2004.

Malayalam Name : Kakani, Kunni, Kunnikuru, Vellakunni

Distribution : Paleotropics, naturalised in Tropical America

Woody perennial twining shrubs. Leaves even-pinnate; leaflets in pairs, oblong to elliptic. Flowers pink or white, in axillary racemes. Pod, oblong, slightly inflated, fulvo-puberulent; seeds many, subglobose, scarlet red with black eye or white without black eye.

Flowering & Fruiting : October-May

Notes : It is a Medicinal and a Poison plant

Herbarium:Coll.No.214.EPN/KVR/CTR/PKD,21.12.2022.,Praveenkumar K.(Fl).

226.*Abrus pulchellus* Wall. ex Thwaites, Enum. Pl. Zeyl. 91. 1859; Baker in Hook. f., Fl. Brit. India 2: 175. 1876; Gamble, Fl. Pres. Madras 350(247). 1918; Sasidh., Fl. Parambikulam WLS 83. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 115. 2004.

Malayalam Name : Valiya kattumuthira

Distribution : Indo-Malesia and China

Twining herbs, glabrous. Leaves paripinnate, leaflets opposite oblong, obtuse. Flowers pink, crowded in short tubercles, on long axillary racemes. Pod, oblong, slightly curved, compressed, glabrous; seeds many, brown.

Flowering & Fruiting : October-March

Notes : It is a Medicinal plant.

227.*Aeschynomene americana* L., Sp. Pl. 713. 1753; Maheswari & Paul, J. Bombay Nat. Hist. Soc. 72: 165. 1975; Chandrab. *et al.*, Bull. Bot. Surv. India 18: 236. 1976; Sasidh., Fl. Shenduruny WLS 87. 1997; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 115. 2004.

Distribution : Central America; now introduced and naturalised in some parts of Peninsular India

Erect or decumbent herbs. Leaves about 20-60 foliolate. Inflorescence few-flowered axillary, racemes. Flowers, Calyx glabrous to hispidulous, bilabiate. Petals yellowish, with red or purplish lines, glabrous. Pod, 3-9 articulate, the

articles semicircular, the upper margin straight, the lower curved, glandular-hispidulous, margins thickened, reticulately-veined; seeds dark brown.

Flowering & Fruiting : September-December

Notes : It is an Exotic and a Weed plant.

228.*Aganope thyrsiflora* (Benth.) Polhill, Kew Bull. 25: 270. 1971; E. Vajr., Fl. Palghat Dist. 145. 1990.*Aganope thyrsiflora* (Benth.) Polhill var. *eualata* (Bedd.) Thoth. & Das, Rheedea 2: 63. 1992; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 116. 2004.*Derris thyrsiflora* Benth. var. eualata (Bedd.) Thoth., Bull. Bot. Surv. India 3: 195. 1961.*Derris eualata* Bedd., Icon. Pl. Ind. Orient. t. 186. 1868-1874; Gamble, Fl. Pres. Madras 388(274). 1918.*Derris platyptera* Baker in Hook. f., Fl. Brit. India 2: 245. 1878. (Plate 9 C).

Distribution : Southern Western Ghats (Endemic)

Large woody climbing shrubs. Leaves pinnate; leaflets elliptic-ovate. Flowers white, in axillary and terminal large panicles of racemes. Standard petal obovate, clawed, claw; wings oblanceolate, shortly clawed; keels obliquely ovate. Pod oblong, flattened, broadly winged on both margins; seeds 1-3, compressed.

Flowering & Fruiting : March-August.

229.*Alysicarpus vaginalis* (L.) DC., Prodr. 2: 353. 1825, var. *vaginalis*; Baker in Hook. f., Fl. Brit. India 2: 158. 1876; Gamble, Fl. Pres. Madras 338(238). 1918; E.Vajr., Fl. Palghat Dist. 146. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 116. 2004.

Malayalam Name : Nila-orila

Distribution : Paleotropics

Diffuse herbs. Basal leaves ovate- orbicular, apiculate; upper leaves oblong to linear-lanceolate,. Flowers in terminal racemes. Calyx equalling or slightly longer than the first joint of pod; segments linear, striate. Corolla pink to purple. Ovules many; style filiform, incurved at apex. Pod subterete, not constricted between the joints, reticulately veined, joints 4-8.

Flowering & Fruiting : September-January

Herbarium:Coll.No.177.VTK/KTR/ALT/PKD,19.01.2022.,Praveenkumar K.(Fl).

230.*Butea monosperma* (Lam.) Taub. in Engl. & Prantl, Naturl. Pflanzenfam. 3(3): 366. 1894; E.Vajr., Fl. Palghat Dist. 147. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 117. 2004.*Erythrina monosperma* Lam., Encycl. 1: 391. 1785.*Butea frondosa* Koenig ex Roxb., Asiat. Res. 3: 369. 1792 & Pl. Corom. t. 21. 1795; Baker in Hook. f., Fl. Brit. India 2: 194. 1876; Gamble, Fl. Pres. Madras 357(252). 1918. (Plate 2 B).

Malayalam Name : Brahmavriksham, Chamatha, Plasu

Distribution : Tropical Asia

Deciduous trees, bark grey to greyish-brown. Leaves trifoliate, Alternate; glabrous above, silky pubescent beneath when mature. bright orange-red, in terminal or axillary. Corolla much exserted; standard petal lanceolate, clawed, wings falcate adnate to keel, keel united curved. Pod, oblong, the base flat, wing-like and indehiscent, the tip splitting round the apical seed; seed obovate, compressed.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant

231.*Centrosema molle* Benth., Comm. Legum. Gen. 55. 1837; Ratheesh, Fl. Stud. Wayanad Dist. 270. 2009.*Centrosema pubescens* auct. non Benth. 1837; E.Vajr., Fl. Palghat Dist. 178. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 119. 2004.*Centrosema virginianum* auct. non (L.) Benth. 1838; Thoth. *et al*., Curr. Sci. 39: 353.1970.*Clitoria virginiana* L., Sp. Pl. 753. 1753.

Malayalam Name : Kattupayar, Poombattapayar

Distribution : Native of America; introduced in India

Pubescent twiners. Leaves 3-foliolate; leaflets ovate or elliptic, the terminal larger than the laterals, pubescent. Racemes axillary, 5-8-flowered. Flowers violet; standard ovate-suborbicular, gibbous at the back above the claw, emarginate, pubescent without; wings falcate, the auricle curved back. Pod linear, compressed with 4-raised ribs near sutures; seeds oblong, brown with dark mottling.

Flowering & Fruiting : September-January

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.83.TTN/KVR/CTR/PKD,25.12.2020., Praveenkumar K.(Fl).

232.*Clitoria ternatea* L., Sp. Pl. 753. 1753, var. *ternatea*; Baker in Hook. f., Fl. Brit. India 2: 208. 1876; Gamble, Fl. Pres. Madras 365(258). 1918; E. Vajr., Fl. Palghat Dist. 148. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 119. 2004. (Plate 4 E).

Malayalam Name : Sankupushpum

Distribution : Widely cultivated in the tropics, probably native of South America

Slender twiners. Leaves odd-pinnate; leaflets 5-7, broadly elliptic, ovate or obovate. Flowers solitary, axillary. Petals blue or white, clawed; standard obovate, emarginate; wings oblong, falcate, adnate to keel; keels obovate, incurved. Pod linear, compressed, apically beaked; seeds many, compressed, reniform, black.

Flowering & Fruiting : July-October

Notes : It is a Medicinal and an Exotic plant. The roots when introduced is said to induce abortion. According to the tribal people, it is effective even as late as the 8th month pregnancy. Leaf made into a paste is applied on swellings. Plants is used as an antidote for snake bite. The flower juice is given for controlling diabetes.

Herbarium:Coll.No.160.PTV/KND/PKD/PKD,18.12.2021.,PraveenkumarK.(Fl).

233.*Crotalaria heyneana* Graham ex Wight & Arn., Prodr. 187. 1834; Baker in Hook. f., Fl. Brit. India 2: 78. 1876; Gamble, Fl. Pres. Madras 297(210). 1918; E.Vajr., Fl. Palghat Dist. 150. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 121. 2004. (Plate 9 G).

Distribution : Southern Western Ghats (Endemic)

Erect shrubs. Leaves simple, Alternate, ovate, obtuse, minutely hairy below; stipule broad, semi-lunar. Raceme terminal. Flowers in terminal and lateral

many-flowered racemes; bracts linear-subulate; bracteolate at middle. Calyx lobes ovate, acuminate, thinly hairy. Petals white or bluish white. Pod minutely hispid, clawed; seeds 10-12, yellow.

Flowering & Fruiting : September-December.

234.*Crotalaria pallida* Dryand. var. obovata (G. Don) Polhill, Kew Bull. 22: 265. 1968; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 123. 2004.*Crotalaria obovata* G. Don, Gen. Hist. 2: 138. 1832.

Distribution : India and Bhutan

Erect branched subshrubs. Leaves Alternate, 3-foliolate; leaflets elliptic-obovate or obovate, rounded. Racemes terminal and lateral, elongated.Flowers lax, numerous, closely arranged towards the top of peduncle. Petals yellow; standard purplish, oblong-elliptic. Pod shortly stipitate; seeds obliquely-cordiform, dark grey-green or brown, finely papillate.

Flowering & Fruiting : November-February.

235.*Crotalaria retusa* L., Sp. Pl. 715. 1753; Baker in Hook. f., Fl. Brit. India 2: 75. 1876; Gamble, Fl. Pres. Madras 293(207). 1918; E.Vajr., Fl. Palghat Dist. 152. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 124. 2004.

Malayalam Name : Chana, Kilukilikki, Poombattakilukki

Distribution : Throughout the tropics

Erects herbs or subshrubs. Leaves simple, Alternate, oblanceolate or obovate. Flowers in few to many-flowered terminal racemes. Petals yellow with red striations; standard orbicular; wings with scaly folds; keels with a line of cottony hairs on inner margin. Staminal sheath. Ovary; ovules many; stigma pubescent. Pod oblong, cylindrical, slightly broader upwards; seeds light brown to black.

Flowering & Fruiting : September-January

Notes : It is a Medicinal plant

Herbarium:Coll.No.121.TAK/KDB/PKD/PKD,28.03.2021.,PraveenkumarK.(Fl).

236.*Crotalaria verrucosa* L., Sp. Pl. 715. 1753; Baker in Hook. f., Fl. Brit. India 2: 77. 1876; Gamble, Fl. Pres. Madras 297(210). 1918; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 125. 2004.

Malayalam Name : Kilukiluppa

Distribution : Pantropical

Erect, branched herbs. Leaves simple ovate-rhomboid or ovate-deltoid, appressed-pubescent on both surfaces. Flowers terminal or leaf-opposed racemes. Corolla blue or white; standard broadly ovate; wings obovate; keels oblong. Ovary stipitate, appressed pubescent; style geniculate. Pod oblong-cylindrical, inflated, 10-16-seeded; seeds obliquely cordiform, yellowish to brownish.

Flowering & Fruiting : August-November.

237.*Dalbergia horrida* (Dennst.) Mabb., Taxon 26: 538. 1977, var. horrida; R. Ansari, Fl. Kasaragod Div. 123. 1985; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 125. 2004.*Amerimnon horridum* Dennst., Schluss. Hort. Malab. 9, 18, 34. 1818.Dalbergia spinosa Roxb., Fl. Ind. 3: 234. 1832; Baker in Hook. f., Fl. Brit. India 2: 238. 1876; Gamble, Fl. Pres. Madras 381(269). 1918.*Dalbergia sympathetica* Nimmo ex Graham, Cat. Pl. Bombay 55. 1839; Hook. f., Fl. Brit. India 2: 234. 1876.*Dalbergia multiflora* Heyne ex Prain, Ann. Roy. Bot. Gard. (Calcutta) 10: 43, t. 18. 1905; Gamble, Fl. Pres. Madras 381(269). 1918. (Plate 9 H).

Malayalam Name : Aanamullu, Cheda, Jadavalli

Distribution : Southern Western Ghats (Endemic)

Lianas. Leaves Alternate, imparipinnate; leaflets firm, oblong, obtuse, glabrouscoriaceous. Inflorescence raceme. Flowers bisexual, zygomorphic. Sepals 5, gamosepalous, green, fleshy. Petals white. Pod, broadly oblong or strap-shaped, flattened, one margin convex and other concave; seeds 1-4.

Flowering & Fruiting : September-January.

238.*Dalbergia lanceolaria* L.f. subsp. *paniculata* (Roxb.) Thoth., Bull. Bot. Surv. India 25: 171. 1985; Sasidh., Fl. Parambikulam WLS 89. 2002; Sasidh., Biodiv.

Doc. Kerala- Fl. Pl. 126. 2004.*Dalbergia paniculata* Roxb., Corom. Pl. 2: 8, t. 114. 1799; Baker in Hook. f., Fl. Brit. India 2: 236. 1876; Gamble, Fl. Pres. Madras 383(270). 1918.*Amerimnon paniculatum* (Roxb.) Kuntze, Revis. Gen. Pl. 1: 159. 1891.

Malayalam Name : Meruthi, Painganni, Pinekanni, Velleetty,

Distribution : India and Myanmar

Small trees. Leaves imparipinnate; leaflets Alternate, oblong-obovate, apex obtuse, base cuneate. Panicles terminal or axillary on tender shoot, pubescent. Flowers; Calyx tube rusty tomentose. Corolla white, standard petal ovate, oblong, wings and keels. Stamens 10, diadelphous. Ovary. Pod to lanceolate, acute; seeds 1 or 2.

Flowering & Fruiting : March-September.

239.*Dalbergia latifolia* Roxb., Corom. Pl. 2: 7, t. 113. 1799; Hook. f., Fl. Brit. India 2: 231. 1876; Gamble, Fl. Pres. Madras 383(270). 1918; E.Vajr., Fl. Palghat Dist. 154. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 127. 2004.*Dalbergia emarginata* Roxb., Fl. Ind. 3: 224. 1832. (Plate 7 C).

Malayalam Name : Cholaveetti, Eeti, Kariveeti, Veeti

Distribution : Indo-Malesia

Deciduous trees. Leaves Alternate, imparipinnate, leaflets obovate-orbicular, glabrous, coriaceous. Flowers white with pale yellow tinge, in short corymbose panicles from the axils of fallen leaves of previous years shoot. Calyx campanulate, petals 5, standard petal obovate, cuneate at base, reflexed, wings clawed, base auricled, keel hastate, united, clawed. Stamens 9, monadelphous. Pod, oblong-lanceolate, indehiscent; seeds 1-4, reniform, brown.

Flowering & Fruiting : August-September

Notes : Wood used for high quality furniture, construction of building, decorative plywoods, handicrafts etc.

240.*Dalbergia sissoides* Graham ex Wight & Arn., Prodr. 1: 265. 1834; Baker in Hook. f., Fl. Brit. India 2: 231. 1870; Gamble, Fl. Pres. Madras 383(270). 1918;

E.Vajr., Fl. Palghat Dist. 154. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 127. 2004.*Dalbergia latifolia* Roxb. var. sissoides (Graham ex Wight & Arn.) Baker in Hook. f., Fl. Brit. India 2: 231. 1876.

Malayalam Name : Chelaveeti, Eetti, Rosewood, Veeti

Distribution : Peninsular India and Indonesia

Deciduous trees. Leaves imparipinnate, Alternate. Flowers bisexual, white, in loose terminal panicles. Fruit a pod tapering to both ends, oblong, stipitate; seeds 2-4, reniform, pale brown.

Flowering & Fruiting : February-August

Notes : Wood used for high quality furniture, construction of building, decorative plywoods, handicrafts etc.

241.*Dalbergia volubilis* Roxb., Corom. Pl. 2: 48. t.191. 1805; Baker in Hook. f., Fl. Brit. India 2: 235. 1876; Gamble, Fl. Pres. Madras 384(270). 1918; E.Vajr., Fl. Palghat Dist. 155. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 127. 2004.

Malayalam Name : Mrithi

Distribution : India, Sri Lanka and Myanmar

Woody climbers. Leaves imparipinnate, Alternate, 8-10-foliolate; leaflets obovate-oblong, glabrous. Panicle terminal and axillary. Flowers bluish-pink; bracts lanceolate, hairy. Calyx lobes ovate, acute, hairy. Standard petal reflexed; keel glabrous. Stamens isodiadelphous. Pod to elliptic, obtuse at apex, shortly cuspidate, stalked, prominently nerved, glabrous; seed solitary.

Flowering & Fruiting : February-June.

242.*Derris scandens* (Roxb.) Benth., J. Linn. Soc. Bot. 4 (Suppl.) 103. 1860; Baker in Hook. f., Fl. Brit. India 2: 240. 1878; Gamble, Fl. Pres. Madras 387(273). 1918; E.Vajr., Fl. Palghat Dist. 155. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 128. 2004.*Dalbergia scandens* Roxb., Pl. Corom. 2: 49, t. 192. 1805.*Brachypterum scandens* (Roxb.) Benth., Ann. Wiener Mus. Naturgesch. Vienna 2: 101. 1838.

Malayalam Name : Muyalvalli, Panivalli, Poonjali, Ponnamvalli

Distribution : Indo-Malesia

Large climbing shrubs. Leaves Alternate, pinnate; leaflets elliptic, lanceolate or ovate-oblong. Racemes axillary with flowers clustered on brown-pubescent rachis. Flowers; pedicels slender. Petals pink or white; standard; ovate-orbicular. Pod oblong, narrowly winged on the upper suture, minutely adpressed tomentose; seeds reniform, compressed, dark brown.

Flowering & Fruiting : June-December

Notes : It is a Medicinal plant

243.*Desmodium scorpiurus* (Sw.) Desv., J. Bot. ser. 2, 1: 122. 1813; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 131. 2004. *Hedysarum scorpiurus* Swartz, Prodr. Veg. Ind. Occ. 107. 1788.

Distribution : Native of America; introduced and naturalised in the pacific regions of Asia

Slender, trailing, pubescent herbs. Leaves Alternate, pinnately trifoliate; leaflets subsessile, elliptic to ovate, terminal leaflet often larger. Racemose, minutely pubescent, leaf-opposed, Flowers solitary or in clusters of 2-3 at nodes;. Petals pink or white turning to pale yellow. Pod linear, slightly turgid, intended on both the sutures densely hooked hairy, 4-7 jointed; seeds oblong, sub turgid brown, smooth.

Flowering & Fruiting : December-July

Notes : It is an Exotic and a Weed plant

Herbarium:Coll.No.170.TKT/CSY/PTB/PKD,28.12.2021., Praveenkumar K.(Fl).

244.*Erythrina variegata* L. in Stickman, Herb. Amboin. 10. 1754; E.Vajr., Fl. Palghat Dist. 161. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 134. 2004.*Erythrina variegata* L. var. *orientalis* (L.) Merr., Interpr. Herb. Amboin. 276. 1917. *Erythrina indica* Lam., Encycl. 2: 391. 1786; Baker in Hook. f., Fl. Brit. India 2: 188. 1876; Gamble, Fl. Pres. Madras 353(249). 1918.

Malayalam Name : Kalyana, Mullumurukku, Murukku

Distribution : Indo-Malesia, China; introduced in Africa

Deciduous trees; prickles black on branches. Leaves trifoliate, Alternate; leaflets widely ovate. Flowers bright red, in dense racemes. Calyx spathaceous, oblique, recurved. Petals 5, sessile; standard oblong-elliptic. Pod torulose, constricted between seeds, dehiscent; seeds 6-8.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant. The wood is used for paper pulp. The leaves are useful in diseases of urinary tract, inflammations and toothache.

245.*Gliricidia sepium* (Jacq.) Kunth ex Walp., Rep. 1: 679. 1842; E.Vajr., Fl. Palghat Dist. 178. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 135. 2004.*Robinia sepium* Jacq., Enum. Syst. Pl. 28. 1760.*Gliricidia macualata* (Steud.) Kunth, Nov. Gen. Sp. 6: 393. 1824.

Malayalam Name : Cheema konna, Seema konna

Distribution : Native of South America; Introduced and now widely grown in India

Trees. Leaves odd-pinnate, Alternate; rachis slender, pulvinate, pubescent. Flowers rose-pink. Calyx campanulate; lobes obscure. Petals exserted; standard orbicular, with 2 callosities above claw; wings oblong, auricled; keels obovate, incurved. Stamens 9+1; staminal tube vexillary stamen free; filaments unequal; anthers uniform. Ovary sessile; style incurved, glabrous; stigma capitate. Pod.

Flowering & Fruiting : March-May

Notes : It is an Exotic plant

Herbarium:Coll.No.220.PKT/AKR/PTB/PKD,29.12.2022.,Praveenkumar K.(Fl).

246.*Grona heterocarpa* (L.) H. Ohashi & K. Ohashi var. *strigosa* (van Meeuwen) H. Ohashi & K.Ohashi, J. Jap. Bot. 93 (2): 112. 2018.*Desmodium heterocarpon* (L.) DC. var. *strigosum* van Meeuwen, Reinwardtia 6: 95. 1961 & 251. 1962; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 130. 2004.

Distribution : Indo-Malesia

Erect herbs; stem strigose. Leaflets elliptic, pubescent below, glaucous, nervules parallel; stipules lanceolate, subulate above. Raceme axillary, densely adpressed-strigose. Flowers densely arranged; bracts ovate, acuminate; calyx lobes ovate, acute, standard obovate, pink. Pods joints squarish, pubescent.

Flowering & Fruiting : October-December.

247.*Grona heterophylla* (Willd.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93 (2): 113. 2018.Hedysarum heterophyllum Willd., Sp. Pl. 3: 620. 1802.*Desmodium heterophyllum* (Willd.) DC., Prodr. 2: 334. 1825; Gamble, Fl. Pres. Madras 347(245). 1918; E.Vajr., Fl. Palghat Dist. 157. 1990 Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 130. 2004.*Desmodium triflorum* (L.) DC. var. majus Wight & Arn., Prodr. 229. 1834.

Malayalam Name : Muyalpullu

Distribution : Indo-Malesia and China

Prostrate herbs. Leaves 3-foliolate; leaflets ovate-elliptic or obovate, glabrescent on ageing; stipules ovate-lanceolate, striate, ciliate on margins. Flowers in axillary 1-4-flowered racemes. Calyx tube broad; lobes triangular with subulate tip, loosely villous without. Corolla pink. Ovary hairy. Pod compressed, dorsal suture continuous, ventral constricted.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant.

248.*Grona triflora* (L.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93 (2): 117. 2018.*Hedysarum triflorum* L., Sp. Pl. 249. 1753.*Desmodium triflorum* (L.) DC., Prodr. 2: 334. 1825; Baker in Hook. f., Fl. Brit. India 2: 173. 1876; Gamble, Fl. Pres. Madras 347(245). 1918; E.Vajr., Fl. Palghat Dist. 159. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 132. 2004.*Desmodium triflorum* (L.) DC. var. minus Wight & Arn., Prodr. 229. 1834.

Distribution : Indo-Malesia and Australia

Malayalam Name : Cherupulladi, Nilamparanda, Nilampulladi

Much branched glabrescent prostrate herbs. Leaves 3-foliolate; leaflets obovate. Flowers 1-4 together in the axils of leaves; pedicels capillary; bracts ovate, ciliate. Calyx covered with long silky hairs; lobes unequal, lanceolate. Petals pink to violet; standard obovate. Pod lower margin deeply indented, upper entire; joints hairy or glabrous, reticulate-veined, longer than broad.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant. Paste of leaves applied to nails as a cure for the disease of the nail.

249.*Indigofera astragalina* DC., Prodr. 2: 228. 1825; 1998; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 136. 2004.*Indigofera hirsuta* sensu Baker in Hook. f., Fl. Brit. India 2: 98. 1876,p.p. non L. 1753; Gamble, Fl. Pres. Madras 312(221). 1918.

Distribution : Pantropical

Densely hairy herbs; stems woody. Leaves pinnate; leaflets elliptic, acute, stipules lanceolate; stipels filiform. Racemes axillary. Flowers densely arranged, shortly pedicelled. Calyx lobes linear. Petals pink, glabrous. Pod 1densely hairy; seeds cubical, black, pitted.

Flowering & Fruiting : October-January.

250.*Indigofera hirsuta* L., Sp. Pl. 751. 1753; Baker in Hook. f., Fl. Brit. India 2: 98. 1876; Gamble, Fl. Pres. Madras 312(221). 1918; E.Vajr., Fl. Palghat Dist. 164. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 137. 2004.

Distribution : Pantropical

Annual erect herbs, whole plant densely brown hirsute. Leaves imparipinnate; leaflets, opposite, elliptic-oblong or obovate. Flowers, in axillary many-flowered, dense racemes. Petals brick-red; standard, obovate, pubescent without. Ovary, cylindrical, densely hairy; ovules many; style slightly curved; stigma capitate. Pod reflexedlinear, subtetragonous, densely hirsute; seeds 5-8, angular, pitted.

Flowering & Fruiting : July-December

Herbarium:Coll.No.24.MDK/CSY/PTB/PKD,15.02.2020., Praveenkumar K.(Fl).

251.*Indigofera tsiangiana* Metcalf, Sunyatsenia 4: 156. 1940.*Indigofera linnaei* Ali, Bot. Not. 111: 549. 1958; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 137. 2004.*Indigofera enneaphylla* L., Mant. Pl. 2: 272. 1771, nom. illeg.; Baker in Hook. f., Fl. Brit. India 2: 94. 1876; Gamble, Fl. Pres. Madras 309(218). 1918.

Malayalam Name : Cherru-pulladi, Chempulladi

Distribution : Indo-Malesia to Australia and West Africa

Trailing, branched, slender annual or perennial herbs with woody rootstock, sparsely grey-pubescent. Leaves imparipinnate; leaflets, subsessile, oblong-obovate, appressed pubescent on both surfaces. Flowers, axillary subcapitate racemes . Petals exserted, red; standard obovate; wings and keels oblong. Staminal sheath; style apically incurved. Pod, oblong-cylindrical or subglobose, appressed hairy; seeds 2.

Flowering & Fruiting : September-December

Notes : It is a Medicinal plant.

252.*Mucuna gigantea* (Willd.) DC., Prodr. 2: 405. 1825; Baker in Hook. f., Fl. Brit. India 2: 186. 1876; Gamble, Fl. Pres. Madras 355(251). 1918; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 139. 2004.*Dolichos giganteus* Willd., Sp. Pl. 3: 1041. 1800.

Malayalam Name : Kakavalli

Distribution : Indo-Malesia, Australia to the Pacific Islands

Twining, climbing lianas. Leaves Alternate; trifoliolate; leaflets elliptic or broadly ovate. Inflorescence condensed, paniculate, pendant many-flowered, the rachis nodes crowded distally. Flowers sulphur-yellow, greenish-yellow or pale green. Fruit indehiscent, oblong, stipitate, the smooth, sutures with a broad parallel wing to each side; seeds broadly ovoid, compressed, dark.

Flowering & Fruiting : December-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.155.AKV/NSY/PTB/PKD,11.12.2021.,Praveenkumar K.(Fl).

253.*Mucuna pruriens* (L.) DC., Prodr. 2: 405. 1825, var. pruriens; Baker in Hook. f., Fl. Brit. India 2: 187. 1876; E.Vajr., Fl. Palghat Dist. 167. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 139. 2004.*Dolichos pruriens* L. in Stickman, Herb. Amboin. 23. 1754 & Syst. Nat. (ed. 10) 1162. 1759.*Stizolobium pruriens* (L.) Medik., Vorels. Churpfalz. Phys.-Ocon. Ges. 2: 339. 1787.*Mucuna prurita* Hook., Bot. Misc. 2: 348. 1831; Gamble, Fl. Pres. Madras 356(251). 1918.

Malayalam Name : Chorivalli, Naikurana

Distribution : India, Myanmar and Sri Lanka

Large climbers. Leaves 3-foliolate; leaflets, the terminal leaflet ovate-rhomboid or elliptic. Flowers in axillary tomentose, pendulous racemes. Calyx-tube pubescent, 4-lobed. Petals dark purplish; standard ovate. Pod linear-oblong, somewhat s-shaped, turgid, densely covered with shining irritant bristly hairs; seeds ovoid, brown or black.

Flowering & Fruiting : October-February

Notes : It is a Medicinal plant

Herbarium:Coll.No.205.AKV/NSY/PTB/PKD,11.07.2022.,Praveenkumar K.(Fl).

254.*Pongamia pinnata* (L.) Pierre, Fl. Forest. Cochinch. sub. t. 385. 1899; E.Vajr., Fl. Palghat Dist. 167. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 141. 2004.*Cytisus pinnatus* L., Sp. Pl. 741. 1753.*Pongamia glabra* Vent., Jard. Malm. 28. t.28.1803; Baker in Hook. f., Fl. Brit. India 2: 240.1876; Gamble, Fl. Pres. Madras 385(272). 1918.Derris indica (Lam.) Bennet, J. Bombay Nat. Hist. Soc. 68. 303. 1971.*Galedupa indica* Lam., Encycl. 2: 594.1788. (Plate 3 G).

Malayalam Name : Ungu

Distribution : Indo-Malesia

Trees. Leaves imparipinnate, Alternate; slender, pulvinate, pubescent; leaflets 5-7, opposite, elliptic-acuminate, elliptic-lanceolate. Flowers purplish-white, in lax axillary racemes. Pod obliquely oblong, flat, thick, pointed at both ends, indehiscent, slightly falcate; seed one, reniform.

Flowering & Fruiting : April-December

Notes : It is a Medicinal plant. The seed oil is used for leather dressing, soap making, lubrication and medicinal purposes.

Herbarium:Coll.No.161.PNK/KVR/CTR/PKD,21.12.2021,Praveenkumar K.(Fl).

255.*Pseudarthria viscida* (L.) Wight & Arn., Prodr. 209. 1834; Baker in Hook. f., Fl. Brit. India 2: 154. 1876; Gamble, Fl. Pres. Madras 334(236). 1918; E.Vajr., Fl. Palghat Dist. 168. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 141. 2004.*Hedysarum viscidum* L., Sp. Pl. 747. 1753. (Plate 8 B).

Malayalam Name : Moovila

Distribution : Peninsular India and Sri Lanka

Viscid pubescent subshrubs. Leaves 3-foliolate; terminal leaflet glabrescent above and densely woolly below. Flowers in axillary or terminal, often branched racemes. Petals purplish; standard ovate-obtuse. Pod linear-oblong, compressed, pubescent with hooked hairs; seeds 4-6, reniform.

Flowering & Fruiting : November-March

Notes : It is a Medicinal plant

Herbarium:Coll.No.14.SHK/KPM/PTB/PKD,01.02.2020., Praveenkumar K.(Fl).

256.*Pterocarpus marsupium* Roxb., Pl. Corom. t. 116. 1799; Baker in Hook. f., Fl. Brit. India 2: 239. 1876; Gamble, Fl. Pres. Madras 385(271). 1918; E.Vajr., Fl. Palghat Dist. 168. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 141. 2004.

Malayalam Name : Karavenga, Venna, Venga

Distribution : India and Sri Lanka

Deciduous trees, exudation blood-red. Leaves imparipinnate, Alternate. Flowers yellow, in terminal and axillary panicles. Pod, orbicular-reniform, broadly winged; seed one, subreniform.

Flowering & Fruiting : September-October

Notes : It is a Medicinal plant. Timber used for construction purposes like building, boat building, vehicle body etc. Extract of heartwood showed significant hypoglycemic action in fasting rabbits three and five hours after oral

administration. No harmful effect noticed in doses which showed hypoglycemic action.

257.*Pueraria phaseoloides* (Roxb.) Benth., J. Linn. Soc. Bot. 9: 125. 1865; Baker in Hook. f., Fl. Brit. India 2: 199. 1876; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 142. 2004.*Dolichos phaseoloides* Roxb., Fl. Ind. 3: 316. 1832.

Malayalam Name : Thotta-payar

Distribution : Tropical Asia

Perennial twiners. Leaves trifoliate; terminal leaflet, triangular-ovate, usually very shallowly lobe. Flowers, mauve to deep purple, in axillary racemes. Pod straight, or slightly curved, linear, cylindrical, thinly covered with stiff adpressed hairs; seeds 10-20, oblong to squarish with rounded corners, brown to brownish black in colour.

Flowering & Fruiting : October-March

Notes : It is an Exotic plant.

258.*Spatholobus parviflorus* (Roxb. ex DC.) Kuntze, Revis. Gen. Pl. 1: 205. 1891; E.Vajr., Fl. Palghat Dist. 172. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 146. 2004.*Butea parviflora* Roxb. ex DC., Prodr. 2: 415. 1825; Manilal, Fl. Silent Valley 70. 1988.*Spatholobus roxburghii* Benth. in Miq., Pl. Jungh. 238. 1852; Baker in Hook. f., Fl. Brit. India 2: 193. 1876; Gamble, Fl. Pres. Madras 358(253). 1918.

Malayalam Name : Adambuvalli, Athambuvalli, Valliplash

Distribution : Indo-Malesia

Lianas. Leaves Alternate, trifoliolate; leaflets ovate. Panicles axillary, densely hispid. Flowers; Calyx densely villous inside. Standard petal glabrous, pale-pink; wings long-clawed; keel obovoid. Pod stalked.

Flowering & Fruiting : September-April

Notes : It is a Medicinal plant.The roots tubers are substituted as Vithari kizhangu.

259.*Tadehagi triquetrum* (L.) H.Ohashi, Ginkgoana 1: 290. 1973.*Hedysarum triquetrum* L., Sp. Pl. 746. 1753.*Desmodium triquetrum* (L.) DC., Prodr. 2: 326. 1825; Baker in Hook. f., Fl. Brit. India 2: 163. 1876,p.p.; Gamble, Fl. Pres. Madras 345(244). 1918; E.Vajr., Fl. Palghat Dist. 159. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 132. 2004.

Malayalam Name : Adakkapaanal, Adakkachokki

Distribution : Tropical and Subtropical Asia

Erect subshrubs. Leaves 1-foliolate, ovate-lanceolate or oblong, glabrous above and tomentose below. Racemes terminal; bracts subulate. Calyx campanulate; lobes lanceolate, acuminate. Petals pink. Stamens monadelphous. Ovary pubescent without; style curved; stigma capitate. Pod laterally compressed, 5-7-jointed, loosely appressed hairy.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant. Tuberous roots chewed in place of betel nut

Herbarium:Coll.No.162.PKM/CVA/OTP/PKD,21.12.2021,PraveenkumarK.(Fl).

260.*Tephrosia purpurea* (L.) Pers., Syn. 2: 329. 1807; Baker in Hook. f., Fl. Brit. India 2: 112. 1876,p.p.; Gamble, Fl. Pres. Madras 320(226). 1918; E.Vajr., Fl. Palghat Dist. 174. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 147. 2004. *Cracca purpurea* L., Sp. Pl. 752. 1753.*Tephrosia hamiltonii* Drumm. ex Gamble, Fl. Pres. Madras 320(226). 1918.

Malayalam Name : Kattamari, Kozhingil, Kozhuva

Distribution : Indo-Malesia

Perennial erect or decumbent herbs or subshrubs. Leaves imparipinnate; leaflets 7-15, oblanceolate or obovate. Flowers in few-flowered, leaf-opposed, pseudoracemes. Pod linear-oblong; seeds 5-7, ellipsoid, dark brown.

Flowering & Fruiting : October-December

Notes : It is a Medicinal plant.

261.*Uraria rufescens* (DC.) Schind., Feddes Repert. 21: 14. 1925; E.Vajr., Fl. Palghat Dist. 175. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 148. 2004.*Desmodium rufescens* DC., Ann. Sci. Nat. (Paris) 4: 101. 1825.*Doodia hamosa* Roxb., Fl. Ind. 3: 367. 1832.*Uraria hamosa* (Roxb.) Wall. ex Wight & Arn., Prodr. 222.1834; Baker in Hook. f., Fl. Brit. India 2: 150. 1876; Gamble, Fl. Pres. Madras 336(237). 1918.

Malayalam Name : Moovila

Distribution : Indo-Malesia

Erect subshrubs; stems triquetrous, hispid. Leaves trifolioate; leaflets elliptic. Flowers pinkish in colour, distant on the raceme; bracts hispid. Joints of pod 6-8, hispid, black.

Flowering & Fruiting : November-January.

262.*Vigna radiata* (L.) Wilczek, Fl. Congo Belge. 6: 386. 1954, var. *radiata*; Sanjappa, Legumes India 275. 1992; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 149. 2004.*Phaseolus radiatus* L., Sp. Pl. 725. 1753; Gamble, Fl. Pres. Madras 363(256). 1918.*Phaseolus mungo* L. var. *radiatus* (L.) Baker in Hook. f., Fl. Brit. India 2: 203. 1876.

Malayalam Name : Cherupayar

Distribution : Paleotropics

Annual, much-branched, erect herbs. Leaves Alternate, stipules broadly ovate-suborbicular to rounded, peltate, hairy. Racemes capitate on peduncle. Flowers shortly pedicellate; bracteoles lanceolate, acuminate. Petals yellow. Pod turgid, erecto-patent or patent, minutely, appressedly bristly-hairy; seeds green or yellow.

Flowering & Fruiting : August-December

Notes : It is a Medicinal, an Exotic and an Edible plant

Herbarium:Coll.No.131.MNK/CVA/OTP/PKD,25.04.2021,PraveenkumarK.(Fl)

263.*Zornia diphylla* (L.) Pers., Syn. Pl. 2: 318. 1807; Baker in Hook. f., Fl. Brit. India 2: 147.1876,p.p.; Gamble, Fl. Pres. Madras 325(229). 1918; Sasidh., Biodiv.

Doc. Kerala- Fl. Pl. 150. 2004.*Hedysarum diphyllum* L., Sp. Pl. 747. 1753.*Zornia conjugata* (Willd.) Smith in Rees, Cyclop. 39: n.3. 1819. *Zornia diphylla* (L.) Pers. var. zeylonensis (Pers.) Baker in Hook. f., Fl. Brit. India 2: 148. 1876.*Zornia zeylonensis* Pers., Syn. 2: 318. 1807; Gamble, Fl. Pres. Madras 325(229). 1918.

Malayalam Name : Murikkotti

Distribution : India and Sri Lanka

Slender herbs, spreading from a central woody root stock. Leaves 2-foilolate, leaflets linear-lanceolate.Racemes axillary or terminal.Bracts geminate, foliaceous, ovate, glandular without, ciliate on margins. Flowers yellow. Pod with 2-5 joints, strongly reticulate with straight fulvous bristles.

Flowering & Fruiting : November-January.

XLIII. FLACOURTIACEAE

264.*Casearia wynadensis* Bedd., Icon. Pl. Ind. Orient. t. 160. 1871; C.B. Clarke in Hook. f., Fl. Brit. India 2: 594. 1879; Gamble, Fl. Pres. Madras 521(368). 1919; E. Vajr., Fl. Palghat Dist. 60. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 32. 2004. **Salicaceae** (APG). (Plate 6 G).

Malayalam Name : Karikunnan

Distribution : Western Ghats (Endemic)

Small trees. Leaves simple, Alternate, lanceolate or oblanceolate, tomentose. Flowers bisexual, greenish. Petals absent. Fruit a capsule, small, oblong, greenish-yellow. Flowering & Fruiting : April-June.

265.*Flacourtia indica* (Burm. f.) Merr., Interpr. Rumph. Herb. Amboin. 377. 1917; E. Vajr., Fl. Palghat Dist. 60. 1990;; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 32. 2004.*Gmelina indica* Burm. f., Fl. Ind. 132. t.39, f. 5. 1768.*Flacourtia sepiaria* Roxb., Pl. Corom. t. 68. 1795; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 194. 1872; Gamble, Fl. Pres. Madras 54(39). 1915.*Flacourtia ramontchi* L'Herit., Strip. Nov. 3: 59. tt. 30 & 30B. 1786; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 193. 1872; Gamble, Fl. Pres. Madras 54(39). 1915. **Salicaceae** (APG).

Malayalam Name : Cherumullikkachedi, Karimulli,

Distribution : Ethiopia to S. Africa, SE. China to Tropical Asia

Dioecious shrubs or small trees. Leaves variable in shape and size, elliptic-ovate, obovate, oblong or suborbicular. Flowers yellowish green, solitary or in few-flowered axillary racemose clusters. Berries subglobose, dark purple when ripe; seeds obovoid, pale yellow.

Flowering & Fruiting : November-March

Notes : It is a Medicinal and an Edible plant . Mature fruits eaten.

266.*Hydnocarpus pentandrus* (Buch.-Ham.) Oken, Allg. Naturf. 3: 1381. 1841; E. Vajr., Fl. Palghat Dist. 61. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 33. 2004.*Chilmoria pentandra* Buch.-Ham., Trans. Linn. Soc. London 13. 501. 1822.*Hydnocarpus laurifolia* (Dennst.) Sleum. in Engl., Bot. Jahrb. Syst. 69: 33. 1938.nom. superfl.*Hydnocarpus wightianus* Blume, Rumph. 4: 22. 1848; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 196. 1872; Dunn in Gamble, Fl. Pres. Madras 52(37). 1915. **Achariaceae** (APG). (Plate 7 G).

Malayalam Name : Maravetti, Marotti, Neeratti.

Distribution : Western Ghats (Endemic)

Dioecious trees.Leaves simple, Alternate, elliptic, elliptic-lanceolate or elliptic-oblong, glabrous. Flowers unisexual, greenish-yellow, solitary or in small fascicle. Fruit a berry, globose, rind thick, brown, rough with uneven surface; seeds numerous, yellowish, obtusely angular.

Flowering & Fruiting : December-May

Notes : It is a Medicinal plant. The seed oil used in skin diseases. The oil is mostly used in making herbal soaps. The seeds or the oil if taken internally act as gastro-intestinal irritant, producing vomiting and purging.

Herbarium:Coll.No.19.KNK/PTR/PTB/PKD, 12.02.2020., Praveenkumar K.(Fl).

XLIV. GENTIANACEAE

267.*Canscora diffusa* (Vahl) R. Br. ex Roem. & Schult., Syst. Veg. 3: 301. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 4: 103. 1883; Gamble, Fl. Pres. Madras 878(617). 1923; E. Vajr., Fl. Palghat Dist. 298. 1990; Mike Thiv, Blumea 48: 11. 2003; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 297. 2004.*Canscora decurrens* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 136.1850; Gamble, Fl. Pres. Madras 878(617). 1923; E. Vajr., Fl. Palghat Dist. 298. 1990.

Malayalam Name : Jeerakapullu

Distribution : Tropical Africa, Asia and Australia

Erect annual, glabrous herbs. Leaves simple opposite, blades of lower leaves broadly ovate or oblong-ovate. Cymes dichasial, terminal or axillary. Corolla often rose, rarely white or orange. Capsule brown, oblong-subcylindric; seeds irregular, testa brown, reticulate.

Flowering & Fruiting : October-January

Notes : It is a Medicinal plant.

Herbarium:Coll.No.86.PSK/TCK/MKD/PKD,18.01.2021.,Praveenkumar K.(Fl).

XLV. GNETACEAE

268.*Gnetum edule* (Willd.) Blume, Nov. Pl. Expos. 31. 1833; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 596. 2004.*Thoa edulis* Willd., Sp. Pl. 4: 477. 1805.*Gnetum ula* Brongn. in Duperr., Voy. Bot. 12. 1829; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1885(1304). 1936; E. Vajr., Fl. Palghat Dist. 459. 1990.

Malayalam Name : Karuthodal, Odal, Sunamkai, Oola kodi

Distribution : Peninsular India

Woody lianas, branches with pustular lenticels. Leaves opposite, elliptic-ovate or oblong, coriaceous, acute. Panicles axillary arising from mature wood; bracts cupular; bracteoles; stamens 1, exserted; female strobilus; ovary globose. Fruit 2, ellipsoid, greenish-yellow.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant

Herbarium:Coll.No.181.EPN/KVR/CTR/PKD,15.02.2022.,Praveenkumar K.(Fl).

XLVI. GOODENIACEAE

269.*Scaevola taccada* (Gaertn.) Roxb., Fl. Ind. 1: 527. 1820.Lobelia taccada Gaertn., Fruct. 1: 119. t.25. 1788. *Scaevola koenigii* Vahl, Symb. Bot. 3: 36. 1794; Hook. f., Fl. Brit. India 3: 421. 1881.*Scaevola sericea* G.Forst. ex Vahl, Symb. Bot. 2: 37. 1791; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 261. 2004.*Scaevola frutescens* (Mill.) Krause in Engl., Pfreich. Gooden.-Brun. 133. 1912; Gamble, Fl. Pres. Madras 734(516). 1921.

Malayalam Name : Badraksham, Vellamodakam

Distribution : Indo-Malesia, Australia to Polynesia

Large shrubs; branchlets thick with prominent leaf scars, green, glabrous. Leaves simple, Alternate and aggregate at the tip of branches. Flowers in axillary short cymose panicles, white. Fruit is a fleshy drupe with persistant calyx.

Flowering & Fruiting : Throughout the year.

XLVII.HALORAGACEAE

270.*Myriophyllum oliganthum* (Wight & Arn.) F. v. Muell., Fragm. Phyt. Austr. 10: 54. 1876; Vajr., Fl. Palghat Dist. 194. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 169. 2004.*Haloragis oligantha* Wight & Arn., Prodr. 338. 1834.*Myriophyllum intermedium* C.B. Clarke in Hook. f., Fl. Brit. India 2: 433. 1878; Gamble, Fl. Pres. Madras 454(321). 1919, non DC. 1828.

Distribution : Peninsular India (Endemic)

Aquatic herbs, glabrous. Leaves Alternate, linear, entire or serrate, flat, glabrous. Flowers sessile, in axillary clusters of 3-6. Sepals 4, oblong. Petals absent. Stamens 4, filaments short; anthers oblong. Ovary 4-celled, ovules solitary in each cell, pendulous; styles 4, free, plumose. Fruit 4-partite, fruitlets tuberculate.

Flowering & Fruiting : March-April.

XLVIII. HYDROPHYLLACEAE

271.*Hydrolea zeylanica* (L.) Vahl, Symb. Bot. 2: 46.1791; C.B. Clarke Hook. f., Fl. Brit. India 4: 133. 1883; Gamble, Fl. Pres. Madras 884(621). 1923; E. Vajr., Fl. Palghat Dist. 301. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 301. 2004. *Nama zeylanica* L., Sp. Pl. 226.1753. **Hydroleaceae** (APG).

Malayalam Name : Vellol

Distribution : Tropical & Subtropical Asia to Australia

Annual herbs. Leaves simple, Alternate, elliptic or lanceolate, , membranous, young parts partly hirsute. Racemes axillary and terminal. Calyx lobes 5, lanceolate, glandular, acute. Corolla lobes, ovate, obtuse, deep blue. Stamens 5, filaments basally dialated. Ovary, oblong, many ovuled, sparsely hispid; styles 2, stigma globose. Capsule, ovoid; seeds oblong-ovoid.

Flowering & Fruiting : August-January.

XLIX. HYPOXIDACEAE

272.*Curculigo orchioides* Gaertn., Fruct. 1: 63. t. 16. f.11. 1788; Hook. f., Fl. Brit. India 6: 279. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1502(1050). 1928; E. Vajr., Fl. Palghat Dist. 505. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 491. 2004.*Curculigo malabarica* Wight, Icon. Pl. Ind. Orient. t. 2043A.1853.

Malayalam Name : Nelpana, Nilappana

Distribution : Indo-Malesia to W. Pacific Islands

Small perennial herbs. Leaves lanceolate, plicate, base sheathing, pilose, subsessile. Inflorescences umbel-like racemes, 2-5-flowered. Perianth yellow; tube narrow, sparsely pilose. Stamens 6, filaments erect. Ovary, villous, 3-celled; ovules many; style columnar, slender; stigma 3-lobed. Fruit baccate; seeds subglobose.

Flowering & Fruiting : June-December

Notes : It is a Medicinal plant. Decoction of the rhizome is used for asthma, and poultice and its paste are used for itch and skin diseases.

Herbarium:Coll.No.215.PKM/CVA/OTP/PKD,21.12.2022,PraveenkumarK.(Fl).

L. ICACINACEAE

273.*Sarcostigma kleinii* Wight & Arn., Edinb. New Phil. J. 14: 299. 1833; Mast. in Hook. f., Fl. Brit. India 1: 594. 1875; Gamble, Fl. Pres. Madras 199(142). 1915; E. Vajr., Fl. Palghat Dist. 115. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 94. 2004.

Malayalam Name : Odal, Odappzham.

Distribution : Indo-Malesia

Woody climbers, branchlets glabrous. Leaves simple, Alternate, oblong-lanceolate. Male spikes slender, axillary or from tubercles; flowers 3-6 together, yellow. Female flowers mostly from old wood. Drupe ovoid, orange-yellow, glabrous; seed rugose, covered by white fleshy pulp.

Flowering & Fruiting : February-June

Notes : It is a Medicinal plant.

Herbarium:Coll.No.20.PBK/KVS/ALT/PKD, 12.02.2020., Praveenkumar K.(Fl).

LI. LAMIACEAE

274.*Anisochilus carnosus* (L. f.) Wall. ex Benth. in Wall., Pl. Asiat. Rar. 2: 18. 1830; Hook. f., Fl. Brit. India 4: 627. 1885; Gamble, Fl. Pres. Madras 1127(788). 1924; E. Vajr., Fl. Palghat Dist. 372. 1990.

Malayalam Name : Chomara, Karpooravalli, Kattukoorkka

Distribution : Indian Subcontinent to Indo-China

Semi-succulent annual herbs. Leaves simple, opposite, broadly ovate, margin crenate-serrate. Flowers in terminal simple or panicled, spikes oblong. Calyx ovoid to cylindrical, pubescent with bright red sessile glands. Corolla purple, lobes 5, 2-lipped, upper lip entire, lower 4-lobed. Stamens 4, exserted; filaments connate at base forming a sheath. Fruits of 4, ovoid nutlets; seeds orbicular, smooth.

Flowering & Fruiting : September-December

Notes : It is a Medicinal plant.

275.*Leucas angularis* Benth. in Wall., Pl. Asiat. Rar. 1: 62. 1830; Hook. f., Fl. Brit. India 4: 684. 1885; Gamble, Fl. Pres. Madras 1151(805). 1924; Manilal, Fl. Silent Valley 219. 1988.*Leucas marrubioides* Desf. var. pulneyensis Hook. f., Fl. Brit. India 4: 684. 1885.

Distribution : South India and Sri Lanka

Prostrate branching herbs. Leaves simple, opposite, membranous, triangular ovate to triangular lanceolate. Verticils axillary, 4-6 flowered; linear, ciliate. Corolla white, margin slightly revolute; upper portion slightly bent forward, concave,. Staminal filaments 5, pubescent; anther cells reddish.

Flowering & Fruiting : March-July.

276.*Leucas aspera* (Willd.) Link, Enum. Hort. Berol. Alt. 2: 113. 1822; Hook. f., Fl. Brit. India 4: 690. 1885; Gamble, Fl. Pres. Madras 1150(803). 1924; E. Vajr., Fl. Palghat Dist. 377. 1990. *Phlomis aspera* Willd., Enum. Hort. Berol. 2: 621. 1809.

Malayalam Name : Thumba, Chiruthumba

Distribution : Tropical & Subtropical Asia

Erect hirsute herbs. Leaves simple, opposite, linear-lanceolate. Verticils terminal and axillary; bract linear, equalling calyx, hirsute. Corolla white, included in calyx tube, outside hairy above, inside middle annulate with oblique and discontinuous ring of fleshy hairs; margin slightly revolute; concave, bent, white spreading hairs outside. Nutlets, dark brownish, glabrous shining.

Flowering & Fruiting : September-January

Notes : It is a Medicinal plant. Juice of the leaves is applied for scabies. The flowers are used to sprinkle water on the head during ceremonies. Juice of fresh leaves or cooked leaves are given in anorexia. Young leaves rubbed on forehead for cold and headache, and also for chronic rheumatism.

Herbarium:Coll.No.95.NKP/PKY/ALT/PKD,12.02.2021., Praveenkumar K.(Fl).

277.*Mesosphaerum suaveolens* (L.) Kuntze, Revis. Gen. Pl. 2: 525. 1891.*Ballota suaveolens* L., Syst. Nat. (ed. 10) 1100. 1759.*Hyptis suaveolens* (L.) Poit., Ann. Mus. Natl. Hist. Nat. Paris 7: 472. t.27. f.2. 1806; Hook. f., Fl. Brit. India 4: 630. 1885; Gamble, Fl. Pres. Madras 1129(789). 1924; E. Vajr., Fl. Palghat Dist. 376. 1990.

Malayalam Name : Nattapoochedi, Naithulasi

Distribution : Originally from America now Pantropical

Shrubs. Leaves simple, opposite, ovate, acute, hispid below, glabrate above. Flowers in axillary short cymose racemes. Calyx tube, tubular, glandular hairy, teeth spinulose. Corolla blue or white. Stamens 4, declinate, filaments free, pubescent; anthers confluent. Ovary 4-partite; style subentire. Nutlets, oblong, compressed, with a ridge on dorsal surface, pubescent, deep brown, mucilaginous when wet.

Flowering & Fruiting : August-February

Notes : It is an Exotic and a Weed plant.

Herbarium:Coll.No.103.EKK/KGD/CTR/PKD,19.02.2021,Praveenkumar K.(Fl).

278.*Ocimum americanum* L., Cent. Pl. 1: 15. 1755; E. Vajr., Fl. Palghat Dist. 380. 1990. *Ocimum canum* Sims, Bot. Mag. 51: t. 2452. 1823; Hook. f., Fl. Brit. India 4: 607. 1885; Gamble, Fl. Pres. Madras 1111(777). 1924.

Malayalam Name : Katturamatulasi, Kattuthrithavu, Kattuthulasi

Distribution : Paleotropics

Erect herbs. Leaves simple, opposite, subentire, sparsely hairy or glabrous. Racemes densely pubescent; flowers 5-7 in each whorl; bracts ovate, sparsely ciliate at margin, acuminate at apex. Corolla white. Nutlets 1 sub-trigonous, minutely pitted, dark brown.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, an Exotic and a Weed plant.

Herbarium:Coll.No.152.PTT/TCK/MKD/PKD,21.10.2021,Praveenkumar K.(Fl).

279.*Ocimum filamentosum* Forssk., Fl. Aegypt.-Arab. 108. 1775.*Becium filamentosum* (Forssk.) Chiov., Nuovo Giorn. Bot. Ital. n.s. 26: 162. 1919.*Ocimum adscendens* Willd., Sp. Pl. 3: 166. 1800; Hook. f., Fl. Brit. India 4: 609. 1885; Gamble, Fl. Pres. Madras 1112(778). 1924; E. Vajr., Fl. Palghat Dist. 379. 1990.

Distribution : Africa, Sri Lanka and Peninsular India

Annual herbs with a short rootstock. Leaves opposite, oblong to ovate-oblong. Racemes; verticils distant. Pinkish white flowers, floral leaves linear-oblong, with a concave, glandular receptacle at base. Nutlets globose, smooth, mucilaginous when wetted.

Flowering & Fruiting : May-June.

280.*Ocimum tenuiflorum* L., Sp. Pl. 597. 1753; E. Vajr., Fl. Palghat Dist. 380. 1990.*Ocimum sanctum* L., Mant. Pl. 1: 85. 1767; Hook. f., Fl. Brit. India 4: 609. 1885; Gamble, Fl. Pres. Madras 1111(778). 1924. (Plate 2 F).

Malayalam Name : Krishnathulasi, Thrithavu, Karuthathrithavu

Distribution : Tropical & Subtropical Asia to Pacific

Subshrubs. Leaves opposite, elliptic-oblanceolate, obtuse at both ends. Racemes generally simple, occasionally branched at base; bracts suborbicular. Calyx purplish, campanulate. Corolla reddish-pink. Nutlets ellipsoid, dark brown.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant. Infusion of leaves is used for gastric disorders. Root decoction is used to treat fever. Plant decoction is used in the treatment of chicken pox. For this purpose, the plant decoction is mixed with the decoction of cumin and coriander and taken in twice a day for three consecutive days.

Herbarium:Coll.No.154.KPT/TCK/MKD/PKD,15.11.2021,PraveenkumarK.(Fl).

281.*Platostoma hispidum* (L.) A.J. Paton, Kew Bull. 52: 273. 1997.*Gomphrena hispida* L., Sp. Pl. 1: 326. 1762. *Acrocephalus hispidus* (L.) Nicolson & Sivad., Taxon 29: 324. 1980; E. Vajr., Fl. Palghat Dist. 372. 1990. *Prunella indica* Burm. f., Fl. Ind. 130. 1768.*Acrocephalus indicus* (Burm. f.) Kuntze, Rev. Gen. Pl. 2: 511. 1891; Gamble, Fl. Pres. Madras 1115(780). 1924.

Malayalam Name : Meenagani

Distribution : Indo-Malesia

Erect annual herbs. Leaves simple, opposite, ovate-lanceolate or elliptic-lanceolate. Flowers grouped in terminal globose, ovoid or short cylindrical heads. Calyx tubular, 2-lipped, upper lip entire, lower usually 4-toothed. Corolla white turning brownish,, 2-lipped, upper lip subequally 4-lobed. Stamens 4, didynamous; anthers 1-celled. Ovary 4-partite; style slender; stigma shortly 2-fid; nutlets 4, minute, smooth.

Flowering & Fruiting : September-December.

Herbarium:Coll.No.189.NTK/PSY/ALT/PKD,20.02.2022.,Praveenkumar K.(Fl).

282.*Pogostemon purpurascens* Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 2: 337. 1850; Hook. f., Fl. Brit. India 4: 632. 1885; Gamble, Fl. Pres. Madras 1133(792). 1924; E. Vajr., Fl. Palghat Dist. 382. 1990.

Malayalam Name : Poothachida

Distribution : India

Densely pubescent diffuse herbs. Leaves simple, opposite, ovate, irregularly dentate. Spikes 10-20-flowered, clustered, racemose or panicled. Calyx tubular; hairy outside with long hairs. Corolla; upper lip purple, lower lip white, lobes acute, hairy. Nutlets 4, ellipsoid to ellipsoid-oblong, reticulate with punctate walls.

Flowering & Fruiting : January-April.

Herbarium:Coll.No.156.KMK/TCK/MKD/PKD,12.12.2021,PraveenkumarK.(Fl)

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LII. LAURACEAE

283.*Cinnamomum malabatrum* (Burm. f.) Blume, Bijdr. 568. 1826; E.Vajr., Fl. Palghat Dist. 403. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 396. 2004. *Laurus malabatrum* Burm. f., Fl. Ind. 92. 1768.*Cinnamomum iners sensu* Gamble, Fl. Pres. Madras 1224(857). 1925, non Reinw. ex Blume 1826. (Plate 9 E).

Malayalam Name : Illavangam, Vayana, Vazhana,

Distribution : Southern Western Ghats (Endemic)

Trees. Leaves simple, opposite or subopposite, elliptic-oblong, oblong or oblong-lanceolate. Flowers bisexual, in axillary and pseudo terminal paniculate cymes with densely minutely subadpressed hairy. Fruit a berry, subtended by shallow fleshy cup; the rim with the persistent thickened, basal part of tepals rounded, pilose.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant.

284.*Cinnamomum verum* Presl, Prir. Rostl. 2: 36. t. 7. 1825; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 397. 2004.*Cinnamomum zeylanicum* Blume, Bijdr. 568. 1826; Hook. f., Fl. Brit. India 5: 131. 1886; Gamble, Fl. Pres. Madras 1224(857). 1925.

Malayalam Name : Edana, Elavangam, Kachakam,

Distribution : South West India and Sri Lanka

Trees. Leaves simple, opposite or subopposite, ovate, elliptic ovate or elliptic-lanceolate. Flowers bisexual, in terminal and axillary, pale yellow; perianth silky. Fruit a berry, ellipsoid to oblong-ovoid, dark purple, surrounded by the enlarged perianth.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant. The bark is used as spice. Cinnamon oil obtained by distilling the bark is used in perfumes, against inflammations, stomach pain, toothache, vomiting and tubercular ulcers.

Herbarium:Coll.No.21.KTN/KSY/PKD/PKD,12.02.2020., Praveenkumar K.(Fl).

285.*Persea macrantha* (Nees) Kosterm., Reinwardtia 6: 193. 1962; E.Vajr., Fl. Palghat Dist. 407. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 401. 2004.*Machilus macrantha* Nees in Wall., Pl. Asiat. Rar. 2: 70. 1831; Hook. f., Fl. Brit. India 5: 140. 1886; Gamble, Fl. Pres. Madras 1227(859). 1925.

Malayalam Name : Kulamavu, Malamavu

Distribution : Peninsular India and Sri Lanka

Evergreen trees. Leaves simple, Alternate, clustered at the tip of branchlets, oblong, elliptic-oblong or ovate-oblong. Flowers bisexual, pale yellow, in panicles from upper axils and terminal. Fruit a berry; seed one, globose.

Flowering & Fruiting : December-May

Notes : It is a Medicinal plant.

LIII. LECYTHIDACEAE

286.*Couroupita guianensis* Aublet, Hist. Pl. Guiane 708. t. 282. 1775; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 180. 2004. (Plate 14 H).

Distribution : Native of Central and Tropical America

Malayalam Name : Nagalingamaram

Trees. Leaves simple, Alternate, spiral, crowed at the apices of branchlets, obovate or oblong-ovate, obtuse or emarginate. Flowers bisexual, in racemes on trunk on lower branches. Petals 6 orange-red with white base. Stamens many, fused into a curved spathulate creamy-white, androphore with layers of staminodes towards the apical part and inner layers of fertile stamens. Ovary half inferior. Fruit globose, berry, surface scurfy; seeds to 200.

Flowering & Fruiting : January-October

Notes : It is an Exotic and a Garden plant.

LIV. LEEACEAE

287.*Leea indica* (Burm. f.) Merr., Philipp. J. Sci. 14. 245. 1919; E. Vajr., Fl. Palghat Dist. 127. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 106. 2004.*Staphylea indica* Burm. f., Fl. Ind. 75, t. 23. f. 2. 1768.*Leea sambucina* (L.) Willd., Sp. Pl. 1: 1177. 1798; Lawson in Hook. f., Fl. Brit. India 1: 666. 1875; Gamble, Fl. Pres. Madras 240(172). 1918. **Vitaceae** (APG)

Malayalam Name : Chorianthali, Njazhuku.

Distribution : Indo-Malesia, China and Australia

Shrubs to small trees. Leaves 2 or 3-pinnate, leaflets oblong or elliptic-lanceolate, serrate-dentate; intercostae parallel. Cymes, peduncles long, paired, axillary. Flowers greenish-white. Staminal tube shortly lobed at apex, anthers combined. Berry purple; seeds densely red-glandular.

Flowering & Fruiting : March-August.

Herbarium:Coll.No.72.EKT/TCK/MKD/PKD,16.12.2020.,Praveenkumar K.(Fl).

LV. LENTIBULARIACEAE

288.*Utricularia aurea* Lour., Fl. Cochinch. 26.1790; E. Vajr., Fl. Palghat Dist. 329. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 329. 2004.*Utricularia flexuosa* Vahl, Enum. Pl. 1: 198. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 329. 1884; Gamble, Fl. Pres. Madras 980(689). 1924.*Utricularia fasciculata* Roxb., Fl. Ind. 1: 143. 1820.

Distribution : Indo-Malesia to Australia and East Asia

Aquatic herbs; rhizoids usually absent. Racemes arising at intervals on the stolons. Flowersyellow in colour, recurved and distally thickened in fruit. Capsule globose with a long beak, circumscissile; seeds disk-shaped, angular, margin winged.

Flowering & Fruiting : September-December.

LVI. LILIACEAE

289.*Asparagus racemosus* Willd., Sp. Pl. 2: 152. 1799; Hook. f., Fl. Brit. India 6: 316. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1517(1060). 1928; Manilal, Fl. Silent Valley 318. 1988. *Protasparagus racemosus* (Willd.) Oberm., J. S. African Bot. 2: 244. 1983; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 495. 2004. **Asparagaceae** (APG). (Plate 4 A).

Malayalam Name : Sathavari, Thalicheria, Thaliperiya,

Distribution : Paleotropics

Woody perennial climbers. Cladodes from the axils of scale leaves in clusters of linear-falcate, slightly triquetrous, base narrow, apex acute. Racemes long,

slender, axillary, solitary or clustered. Flowers bisexual; bracts triangular. Berry globose, purple on ripening; seeds globose.

Flowering & Fruiting : July-August

Notes : It is a Medicinal plant. Boiled tuberous roots are eaten once a day for treatment of diabetes for a long time.

290.*Gloriosa superba* L., Sp. Pl. 305. 1753; Hook. f., Fl. Brit. India 6: 358. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1519(1061). 1928; E. Vajr., Fl. Palghat Dist. 510. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 494. 2004. **Colchicaceae** (APG). (Plate 7 E).

Malayalam Name : Karthikapoovu, Menthonni, Ventoni

Distribution : Paleotropics

Herbaceous climbers. Leaves subsessile, Alternate, opposite or whorled, ovate-lanceolate. Flowers bisexual, showy, axillary, solitary or in few-flowered, terminal racemes. yellowish below and reddish above. Capsule ellipsoid-oblong; seeds many, globose, warty.

Flowering & Fruiting : July-December

Notes : It is a Medicinal and a Poison plant.

Herbarium:Coll.No.210.PKM/CVA/OTP/PKD,01.12.2022,PraveenkumarK.(Fl).

LVII. LOBELIACEAE

291.*Lobelia alsinoides* Lam., Encycl. 3: 588. 1792; E. Vajr., Fl. Palghat Dist. 260. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 262. 2004.*Lobelia trigona* Roxb., Fl. Ind. 2: 111. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 3: 423. 1881; Gamble, Fl. Pres. Madras 736(518). 1921. **Campanulaceae** (APG).

Malayalam Name : Kakkapoo

Distribution : Tropical Asia

Decumbent herbs, rooting from lower nodes. Leaves simple, Alternate, ovate-orbicular. Flowers in terminal raceme. Sepals lanceolate. Corolla blue, upper 3

lobes obovate, lower 2 lobes narrower. Capsule, glabrous; seeds trigonous, brown.

Flowering & Fruiting : August-October.

LVIII. LOGANIACEAE

292. *Fagraea ceilanica* *Thunb., Vetensk. Acad. Handl. 3: 132. 1782; C.B. Clarke in Hook. f., Fl. Brit. India 4: 83. 1883 "zeylanica"; Gamble, Fl. Pres. Madras* 865(608). 1923; E. Vajr., Fl. Palghat Dist. 294. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 295. 2004.*Fagraea obovata* Wall. in Roxb., Fl. Ind. 2: 33. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 4: 83. 1883; Gamble, Fl. Pres. Madras 865(608). 1923.*Fagraea coromandelina* Wight, Icon. Pl. Ind. Orient. t. 1316. 1848.*Fagraea malabarica* Wight, Icon. Pl. Ind. Orient. t.1317. 1848. **Gentianaceae** (APG).

Malayalam Name : Kompal, Modakam, Modakakkodi.

Distribution : Indo-Malesia

Small trees, usually epiphytic on tree trunks or sometimes lithophytic; branchlets stout with prominent leaf-scars. Leaves simple, opposite. Inflorescence terminal or axillary, few-flowered corymbose cymes. Flowers creamy white. Corolla funnel-form. Berry ellipsoid, shiny; seeds many.

Flowering & Fruiting : March-November

293. *Strychnos minor* Dennst., Schluss. Hort. Malab. 15,25,33. 1818; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 296. 2004.*Strychnos colubrina* sensu C.B. Clarke in Hook. f., Fl. Brit. India 4: 87. 1883,p.p., non L. 1753.*Strychnos lenticellata* A.W. Hill, Bull. Misc. Inform. Kew 1917: 159. 1917; Gamble, Fl. Pres. Madras 868(610). 1923; E. Vajr., Fl. Palghat Dist. 295. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 296. 2004.

Malayalam Name : Cherukanjiravally

Distribution : Indo-Malesia

Climbing shrubs; bark pale brown. Leaves simple, opposite, ovate or elliptic-ovate, coriaceous, 3-ribbed from a little above the base. Flowers white in cymes.

Calyx lobes long. Corolla tube throat woolly; lobes ovate-acute, as long as the tube. Ovary and style hirsute. Berry woody, s; seeds 1-3, orbicular.

Flowering & Fruiting : September-October.

294.*Strychnos nux-vomica* L., Sp. Pl. 189. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 90. 1883; Gamble, Fl. Pres. Madras 868(610). 1923; E. Vajr., Fl. Palghat Dist. 296. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 296. 2004. (Plate 2 H).

Malayalam Name : Kanjiram

Distribution : Indo-Malesia

Trees, bark thin, yellowish or blackish-grey. Leaves simple, opposite, elliptic, broadly elliptic or elliptic-ovate. Flowers bisexual, greenish-white, in terminal sessile cymes, sessile, tomentose. Corolla greenish-yellow. Fruit a berry, globose, yellowish-red or orange, glabrous; seeds 3 or 4, orbicular, flat, shiny, greenish-white.

Flowering & Fruiting : March-December

Notes : It is a Medicinal and a Poison plant. The timber is durable, used to make tool handles, agricultural implements etc. The seed and root are poisonous. Seeds are ground with human milk, made into a paste and applied on the head to cure fever due to chicken pox. The stick with three branches is used in witchcraft.

Herbarium:Coll.No.169.CSS/SKP/OTP/PKD, 25.12.2021., Praveenkumar K.(Fl).

295.*Strychnos wallichiana* Steud. ex A.DC. in DC., Prodr. 9: 13. 1845; C.N. Mohanan, Fl. Quilon Dist. 262. 1984; *Strychnos colubrina* L., Sp. Pl. 189. 1753, nom. rej.; C.B. Clarke in Hook. f., Fl. Brit. India 4: 87. 1883; Gamble, Fl. Pres. Madras 868(610). 1923; Sasidh., Fl. Parambikulam WLS 199. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 295. 2004.*Strychnos rheedei* C.B. Clarke in Hook. f., Fl. Brit. India 4: 87. 1883. *Strychnos cinnamomifolia* Thw., Enum. Pl. Zeyl. 201. 1860, var. wightii Hill, Bull. Misc. Inform. Kew 1917: 194. 1917; Gamble, Fl. Pres. Madras 869(610). 1923; Manilal & Sivar., Fl. Calicut 172. 1982.

Malayalam Name : Modirakanjiram, Vallikanjiram

Distribution : Indo-Malesia

Tendrillate climbers. Leaves simple, opposite, broadly elliptic, abruptly acuminate, shining. Cymes axillary and terminal, peduncled. Flowers greenish Berry globose, glabrous, greenish; seeds ovoid, flattened.

Flowering & Fruiting : February-July.

LIX. LORANTHACEAE

296.*Dendrophthoe falcata* (L. f.) Etting., Denkschr. Kaisel. Akad. Wiss. Math.-Naturwiss. Klasse 32: 52,53,58. t.13. 1871, var. *falcata*; E. Vajr., Fl. Palghat Dist. 409. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 402. 2004.*Loranthus falcatus* L. f., Suppl. Pl. 211. 1781.*Loranthus longiflorus* Desr. in Lam., Encycl. 3: 598. 1792; Hook. f., Fl. Brit. India 5: 214. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.*Loranthus longiflorus* Desr. var. *falcata* (L. f.) Kurz, For. Fl. Burma 2: 321. 1877; Hook. f., Fl. Brit. India 5: 215. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.*Dendrophthoe falcata* (L. f.) Etting. var. *pubescens* (Hook. f.) Chandrab. in Henry *et al.*, Fl. Tamil Nadu 2: 215. 1987. *Loranthus longiflorus* Desr. var. *pubescens* Hook. f., Fl. Brit. India 5: 215. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.

Malayalam Name : Ithikkanni, Itthikkanni, Ithil,

Distribution : Indo-Malesia to Australia

Parasitic shrubs. Leaves simple, subopposite, ovate-oblong to lanceolate, thickly coriaceous. Inflorescence axillary and lateral, curved racemes, many-flowered. Corolla tube pink or yellow, curved, slender at base, widening to top; lobes green, linear, recurved. Filaments bright red; anthers yellow, linear-oblong. Berry oblong, crimson.

Flowering & Fruiting : December-May

Notes : It is a Medicinal plant.

Herbarium:Coll.No.101.TBK/TCK/MKD/PKD,18.02.2021,PraveenkumarK.(Fl).

297.*Helicanthes elastica* (Desr.) Danser, Verh. Akad. Wet. afd. Natuurk. Sect. 2. 29: 55. 1933; E. Vajr., Fl. Palghat Dist. 410. 1990; Sasidh., Biodiv. Doc. Kerala-Fl.

Pl. 403. 2004.*Loranthus elasticus* Desr. in Lam., Encycl. 3: 599. 1792; Hook. f., Fl. Brit. India 5: 216. 1886; Gamble, Fl. Pres. Madras 1254(877). 1925.*Dendrophthoe elasticus* (Desr.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 308. 1929. (Plate 10 C).

Malayalam Name : MavuIththill

Distribution : Peninsula India (Endemic)

Semi-parasitic subshrubs. Leaves opposite, ovate or elliptic-oblong, base obtuse or truncate, thickly coriaceous, glaucous beneath, sessile or subsessile. Flowers aggregated in short axillary fascicles. Calyx minute, flask-shaped, margin truncate. Corolla white or pink with green stripes, split lengthwise into 5 linear, twisted lobes. Stamens 5, exserted, filaments crimson. Berry obovoid, red.

Flowering & Fruiting : December-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.198.VKK/KTP/OTP/PKD,25.03.2022.,Praveenkumar K.(Fl).

LX. LYTHRACEAE

298.*Lagerstroemia microcarpa* Wight, Icon. Pl. Ind. Orient. t. 109. 1839; E. Vajr., Fl. Palghat Dist. 205. 1990. *Lagerstroemia lanceolata* Wall. ex C.B. Clarke in Hook. f., Fl. Brit. India 2: 576. 1879; Gamble, Fl. Pres. Madras 513(362). 1919.*Lagerstroemia thomsonii* Koehne in Engl., Pflanzenreich Lythrac. 257. 1903; Gamble, Fl. Pres. Madras 513(362). 1919. (Plate 11 C).

Malayalam Name : Vellilavu, Venthekku

Distribution : Southwest India (Endemic)

Deciduous trees. Leaves simple, opposite, glabrous and shining above, velvety pubescent beneath, chartaceous. Flowers bisexual, white, in axillary and terminal panicles. Fruit a capsule, ovoid, dehiscent; seeds many, elongate, falcate winged, brownish.

Flowering & Fruiting : June-February.

299.*Lagerstroemia speciosa* (L.) Pers., Syn. 2: 72.1806; Manilal & Sivar., Fl. Calicut 114. 1982; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 188. 2004.*Lagerstroemia*

reginae Roxb., Pl. Corom. t. 65. 1796; E. Vajr., Fl. Palghat Dist. 205. 1990.*Lagerstroemia flos-reginae* Retz., Obs. Bot. 5: 25.1788; C.B. Clarke in Hook.f., Fl. Brit. India 2: 577.1879; Gamble, Fl. Pres. Madras 513(362). 1919.*Lagerstroemia hirsuta* (Lam.) Willd., Sp. Pl. 2: 1178. 1799.

Malayalam Name : Cholaventekku, Manimaruthu, Poomaruthu

Distribution : Tropical Asia

Deciduous trees. Leaves simple, opposite or subopposite, glabrous, coriaceous. Flowers bisexual, mauve, pink or white, in terminal panicles; inflorescence branches puberulous. Fruit a capsule, ovoid, brown, woody, dehiscent; seeds, winged, pale brown.

Flowering & Fruiting : March-November

Notes : It is a Medicinal plant. Timber used for furniture. Lagerstroemia speciosa possess many Pharmacological effects included antimicrobial, antioxidant, anticancer, antidiabetic, hypolipidemic, antiobesity, anti-inflammatory, analgesic, gastrointestinal, diuretic, thrombolytic, cardiovascular, central nervous, inhibition of TNFα production, xanthine oxidase inhibitition, hepatoprotective and nephroprotective effects. (Int. J. Curr. Pharm. Res. 11 (5): 18-26. 2019.)

Herbarium:Coll.No.207.SVK/CSY/PTB/PKD,18.11.2022., Praveenkumar K.(Fl).

LXI. MAGNOLIACEAE

300.*Magnolia champaca* (L.) Baill. ex Pierre, Fl. Forest. Cochinch. t. 3. 1880.*Michelia champaca* L., Sp. Pl. 536. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 42. 1872; Dunn in Gamble, Fl. Pres. Madras 9 (6). 1915; E. Vajr., Fl. Palghat Dist. 45. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 15. 2004.*Michelia rheedei* Wight, Ill. Ind. Bot. 1: 14. 1840.

Malayalam Name : Chembakam, Champakam

Distribution : Indo-Malesia and China

Evergreen trees. Leaves simple, Alternate, ovate, ovate-lanceolate, puberulent beneath;. Flowers bisexual, yellow or white, fragrant, axillary or terminal,

solitary. Fruit an aggregate of capsules laxly arranged, ovoid to ellipsoid with white sparkle; seeds enclosed by fleshy red aril.

Flowering & Fruiting : March-July

Notes : It is a Medicinal and a Garden plant. Timber used in building constructions and for ornamental plywood, veneers etc. The flowers yield fragrant essential oil. The seeds and fruits are useful in the treatment of psoriasis plantaris.

Herbarium:Coll.No.207.PPK/TVP/PTB/PKD,18.11.2022., Praveenkumar K.(Fl).

LXII.MALPIGHIACEAE

301.*Hiptage benghalensis* (L.) Kurz, J. Asiat. Soc. Bengal 43: 136. 1874; E. Vajr., Fl. Palghat Dist. 97. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 66. 2004.*Banisteria benghalensis* L., Sp. Pl. 427. 1753.*Hiptage madablota* Gaertn., Fruct. 2: 169,t.116. 1791; Dunn in Gamble, Fl. Pres. Madras 128(91). 1915.*Gaertnera racemosa* Roxb., Pl. Corom. t. 18. 1795 & Fl. Ind. 2: 368. 1832.*Hiptage parvifolia* Wight & Arn., Prodr. 107. 1834; Hook. f., Fl. Brit. India 1: 419. 1874; Dunn in Gamble, Fl. Pres. Madras 128(91). 1915; R.C. Srivastava, Journ. Econ. Tax. Bot. 6: 72. 1985 & in Hajra *et al.* (eds.), Fl. India 4: 24. 1997.

Malayalam Name : Chittilakody. Madhavilatha

Distribution : Indo-Malesia and China

Large woody climbers. Leaves opposite, elliptic-oblong to lanceolate with a pair of glands on petioles at the base of lamina. Flowers, bisexual, in axillary or terminal racemes; peduncles articulated with pedicels. Petals 5, white, clawed, reflexed, margin crisped. Stamens, unequal; filaments united at base. Ovary, 3-lobed; style; stigma capitate. Fruit a 3-winged samara, one wing larger; seeds, globose.

Flowering & Fruiting : January-November

Notes : It is a Medicinal plant.

LXIII. MALVACEAE

302.*Abelmoschus manihot* (L.) Medik., Malv. 46. 1787; Sharma & Sanjappa (eds.), Fl. India 3: 304. 1993; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 46. 2004. *Hibiscus manihot* L., Sp. Pl. 696. 1753.

Distribution : Tropical & Subtropical Asia to Australia.

Prickly shrubs; stems with stiff hairs. Leaves simple, Alternate, 3-5 lobed, crenate-serrate. Flowers white, in terminal racemes; involucral bracts densely hairy. Capsule densely hairy, subtended by the enlarged epicalyx.

Flowering & Fruiting : July-December.

Note: The seeds are repoted to be used as a flavouring agent for coffee.

303.*Abutilon guineense* (Schumach.) Baker f. & Exell, J. Bot. 74(Suppl.): 22. 1936. (Schumach.) K.M. Feng, Acta Bot. Yunnan. 4: 28. 1982. *Sida guineensis* Schumach., Beskr. Guin. Pl. 307. 1827.

Distribution : Asia, Africa and Australia

Shrubs; stems with minute stellate hairs. Leaves Alternate, ovate-cordate, sparsely stellate hairy above, densely so beneath. Flowers axillary, solitary; with pale green calyx and orange-yellow corolla. Schizocarp globular with a flattened apex.

Flowering & Fruiting : February-June.

304.*Hibiscus hispidissimus* Griff., Not. Pl. Asiat. 4: 521. 1854; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 49. 2004.*Hibiscus aculeatus* Roxb., Fl. Ind. 3: 206. 1832; E. Vajr., Fl. Palghat Dist. 79. 1990.*Hibiscus furcatus* Roxb. ex DC., Prodr. 1: 448. 1824; Mast. in Hook. f., Fl. Brit. India 1: 335. 1874; Dunn in Gamble, Fl. Pres. Madras 97(70). 1915.

Malayalam Name : Panacham,Kalapoo,Matthippuli,

Distribution : Paleotropics

Rambling or climbing shrubs. Leaves entire, prickly on the nerves beneath, prickly; stipules lanceolate, ciliate. Flowers axillary, solitary; jointed above

middle, prickly. Involucral bracts bifurcate, apex spathulate. Corolla, yellow with deep purple center. Capsule, ovoid or conical, bristly hairy; seeds dark brown, concentrically tubercled.

Flowering & Fruiting : September-March

Notes : It is a Medicinal and a Weed plant.

Herbarium:Coll.No.153.PKV/AKR/PTB/PKD,01.11.2021.,Praveenkumar K.(Fl).

305.*Hibiscus rosa-sinensis* L. Sp. Pl. 694 1753; Mast. in Hook. f., Fl. Brit. India 1: 334. 1874; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 50. 2004. (Plate 16 E).

Malayalam Name : Ayamparathi, Chembarathi

Distribution : Native of Pacific Islands; cultivated in Tropical and Subtropical countries

Shrubs; stems woody and glabrous. Leaves simple, Alternate, ovate to ovate-lanceolate. Flowers axillary, solitary; jointed above middle, glabrous or pubescent. Corolla infundibular, , white, pink, yellow or orange yellow; petals obovate, entire or crenulate-lobed. Staminal column,exserted beyond corolla, antheriferous in upper half. Capsules rarely formed.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, an Exotic and a Garden plant. There are many cultivars which varies in the colour flowers and number of petals.

Herbarium:Coll.No.113.PLK/AKR/PTB/PKD,12.03.2021.,Praveenkumar K.(Fl).

306.*Hibiscus sabdariffa* L., Sp. Pl. 695. 1753; Dunn in Gamble, Fl. Pres. Madras 99(71). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 50. 2004.

Malayalam Name : Mathipuli, Papuli, Puichchai, Pulivenda

Distribution : Native of Tropical Africa; widely cultivated in all tropical regions, also runs wild.

Erect shrubs. Leaves Alternate, polymorphic, entire or palmately 3-5 fid, partite or lobed; midlobe lanceolate or oblong, longer than the rest, glabrous; midnerve with a nectary at base beneath. Flowers axillary, solitary or in racemose panicles

by reduction of upper leaves;, jointed near base, glabrous. Corolla, yellow with a purple centre; petals orbicular, glabrous. Capsules ovoid, densely strigose; seeds reniform, furfuraceous; epicalyx red..

Flowering & Fruiting : December-February

Notes : It is a Medicinal and an Exotic plant.

Herbarium:Coll.No.195.CKV/VPZ/PTB/PKD,18.03.2022.,Praveenkumar K.(Fl).

307.*Hibiscus schizopetalus* (Mast.) Hook. f., Bot. Mag. 106. t. 6524. 1880.*Hibiscus rosa-sinensis* f. *schizopetalus* Mast., Gard. Chron. 11: 568. 1879; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 50. 2004.

Malayalam Name : Tookuchemparuthi

Distribution **:** Native of Tropical East Africa; cultivated throughout tropics

Shrubs with woody stem. Leaves Alternate, ovate or elliptic, glabrous. Flowers axillary, solitary and pendulous. Corolla red with pink streaks. Ovary pyriform, minutely hairy; style; stigmas capitate. Capsules rarely formed.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant.

308.*Sida acuta* Burm. f., Fl. Ind. 147. 1768, Dunn in Gamble, Fl. Pres. Madras 90(64). 1915; E. Vajr., Fl. Palghat Dist. 82. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 52. 2004.*Sida lanceolata* Retz., Obs. Bot. 4: 119. 1786.*Sida carpinifolia* sensu Mast. in Hook. f., Fl. Brit. India 1: 323. 1874 p.p. non L. f. 1781**.**

Malayalam Name : Anakurunthotti, Malamkurunthotti,

Distribution : Pantropical

Erect subshrubs. Leaves simple, Alternate, lanceolate to ovate. Flowers solitary, axillary. creamy-yellow, obliquely obovate. Schizocarp; mericarps 6-8, trigonous, reticulate, apically 2-awned; seeds, trigonous.

Flowering & Fruiting : August-October

Notes: It is a Medicinal and a Weed plant. Broom sticks are made out of dried stems. Paste prepared from leaves and young shoots applied over boils. Also, used for scabies and other skin diseases.

309.*Sida alnifolia* (L.) Ugbor., Bol. Soc. Brot. ser. 54: 70. 1980. *Sida alnifolia* L., Sp. Pl. 684. 1753; Sasidh., Fl. Parambikulam WLS 29. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 53. 2004.*Sida retusa* L., Sp. Pl. (ed. 2) 961. 1763.*Sida rhombifolia* L. var. *retusa* (L.) Mast. in Hook. f., Fl. Brit. India 1: 324. 1874.*Sida rhombifolia* L. subsp. *retusa* (L.) Borss.Waalk., Blumea 14: 198. 1966. (Plate 12 D).

Malayalam Name : Kurunthotti

Distribution : Indo-Malesia to Pacific Islands

Subshrubs, strongly branched. Leaves simple, Alternate, obovate to elliptic-lanceolate. Flowers axillary, solitary. yellow in colour, obliquely obovate. Mericarps 7-10, included in the calyx, with a pair of short obtuse mucro at apex; seeds black.

Flowering & Fruiting : September-December

Notes : It is a Medicinal plant.

310.*Sida beddomei* Jacob, J. Bombay Nat. Hist. Soc. 47: 50. 1950; Sasidh., Fl. Parambikulam WLS 29. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 52. 2004.*Sida cordata* sensu T.K. Paul & M.P. Nayar, Fl. Ind. Fasc. 19: 206. 1988 & Fl. Ind. 3: 285. 1993, non (Burm.f.) Borss.Waalk., 1966. (Plate 12 E).

Malayalam Name : Vallikurunthotti

Distribution : Southern Western Ghats (Kerala) (Endemic)

Slender prostrate herbs. Leaves simple, Alternate, ovate. Flowers axillary, solitary or binate, yellow; pedicel slender, jointed near the flowers. Calyx lobes longer than the tube; acuminate.Petals 5, yellow, obovate, often notched. Carpels 5, sparsely pubescent towards apex. Mericarps awn less; seeds dark brown, glabrous.

Flowering & Fruiting : January-March.

311.*Sida cordata* (Burm. f.) Borss.Waalk., Blumea 14: 182. 1966; E. Vajr., Fl. Palghat Dist. 83. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 52. 2004.*Melochia cordata* Burm. f., Fl. Ind. 143. 1768.Sida veronicaefolia Lam., Encycl. 1: 5. 1783; Dunn in Gamble, Fl. Pres. Madras 89(64). 1915.*Sida humilis* Cav. var. *veronicaefolia* (Lam.) Mast. in Hook. f., Fl. Brit. India 1: 322. 1874.

Malayalam Name : Vallikurunthotti, Palkurunthotti

Distribution : Tropical and Subtropical Asia

Prostrate herbs; branches slender, trailing. Leaves simple, Alternate, broadly ovate or orbicular, margins serrate-crenate. Flowers axillary, solitary; filiform, articulated above the middle, yellow in colour. Schizocarp long; mericarps 5, trigonous with rounded angles, apex shortly 2-beaked, completely enclosed in accrescent calyx; seeds reniform, brownish-black.

Flowering & Fruiting : January-April

Notes : It is a Medicinal plant.

312.*Sida cordifolia* L., Sp. Pl. 684. 1753; Mast. in Hook. f., Fl. Brit. India 1: 324. 1874; Dunn in Gamble, Fl. Pres. Madras 89(64). 1915; E. Vajr., Fl. Palghat Dist. 83. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 53. 2004.

Malayalam Name : Anakurunthoti.

Distribution : Pantropical

Erect, branched subshrubs. Leaves simple, Alternate, ovate, rarely suborbicular. Solitary or aggregated terminally in to congested corymbiform inflorescence; yellow in colour. Schizocarp pubescent towards apex; mericarps trigonous with acute angles, apically 2-awned; seeds brownish or black.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and a Weed plant.

313.*Sida mysorensis* Wight & Arn., Prodr. 59. 1834; Mast. in Hook. f., Fl. Brit. India 1: 322. 1874; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 53. 2004.*Sida hirta* Wall., Cat. n. 1855, 1828, non Lam. 1783.*Sida glutinosa* Roxb., Fl. Ind. 3: 172. 1832, non

Cav. 1785; Dunn in Gamble, Fl. Pres. Madras 89(64). 1915; E. Vajr., Fl. Palghat Dist. 83. 1990.*Sida urticifolia* Wight & Arn., Prodr. 59. 1834, non St. Hill. 1828.

Distribution : Tropical & Subtropical Asia

Erect subshrubs. Leaves simple, Alternate, broadly ovate, pubescent with stellate and simple hairs intermingled with gland-hairs on both surfaces. Flowers axillary, solitary or often in 5-7-flowered, orange-yellow, obovate, emarginate or retuse at apex. Schizocarp; mericarps 5, trigonous; seeds reniform, brownish-black.

Flowering & Fruiting : October-February.

314.*Thespesia populnea* (L.) Soland. ex Correa, Ann. Mus. Natl. Hist. Nat. Paris 9: 290.1807; Mast. in Hook. f., Fl. Brit. India 1: 345.1874; Dunn in Gamble, Fl. Pres. Madras 101(72). 1915; E. Vajr., Fl. Palghat Dist. 84. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 54. 2004.*Hibiscus populneus* L., Sp. Pl. 694. 1753.

Malayalam Name : Cheelanthi, Pooparutthi, Poovarasu.

Distribution : Native of Old World, tropics; widely naturalized in Central America, northern South America, the Caribbean islands and Florida

Trees. Leaves simple, Alternate, orbicular or ovate, glabrescent. Flowers bisexual, yellow, solitary or in cymes, axillary or terminal; pedicels jointed near the base, glabrescent. Capsule, globose, indehiscent, depressed.

Flowering & Fruiting : March-June

Notes : It is a Medicinal plant. Timber used for furniture and building construction. The plant is useful in skin disorders such as scabies, psoriasis, ringworm and guinea worm. Leaves and fruits are ground into a paste with a little turmeric and sALT/PKD, and used externally to treat scabies.

315.*Urena lobata* L. subsp. *lobata*; Mast. in Hook. f., Fl. Brit. India 1: 329. 1874; Dunn in Gamble, Fl. Pres. Madras 92(66). 1915; Borss.Waalk., Blumea 14: 140. 1966; E. Vajr., Fl. Palghat Dist. 85. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 55. 2004.

Malayalam Name : Cheeli, Uthiram, Uram, Vattooram.

Distribution : Pantropical

Erect branched subshrubs. Leaves simple, Alternate, sparsely stellate-pubescent above. Flowers axillary, usually solitary, pink with dark center in colour. Schizocarp globose; mericarps 5, trigonous, densely stellate-pubescent, also with many glochidiate spines; seeds reniform, angular.

Flowering & Fruiting : August-December.

Herbarium:Coll.No.26.PPM/VZY/OTP/PKD,18.02.2020., Praveenkumar K.(Fl).

LXIV. MELASTOMATACEAE

316.*Memecylon depressum* Benth. ex Triana, Trans. Linn. Soc. London 25: 158. 1865-1866; Gamble, Fl. Pres. Madras 505(357). 1919; E. Vajr., Fl. Palghat Dist. 202. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 181. 2004.

Malayalam Name : Kaikkathetti

Distribution : Southern Western Ghats (Endemic)

Shrubs; branchlets tetragonous towards the upper part of each internode, terete below. Leaves ovate-oblong, acute at apex, subsessile, brown when dried, nerves about 12 pairs, subdistinct. Cymes, densely branched. Flowers, many-together. Calyx teeth acute. Petals, ovate, acute, bluish white. Staminal filaments, anthers curved. Style. Berry.

Flowering & Fruiting : January-March.

317.*Memecylon randerianum* S.M. Almeida & M.R. Almeida, J. Bombay Nat. Hist. Soc. 85: 521. 1989; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 182. 2004.*Memecylon malabaricum* (C.B. Clarke) Cogn. in A. & C.DC., Monogr. Phan. 7: 1148. 1891; Gamble, Fl. Pres. Madras 505(356). 1919.*Memecylon amplexicaule* Roxb. var. *malabarica* C.B. Clarke in Hook. f., Fl. Brit. India 2: 559. 1879p.p. (Plate 11 D).

Malayalam Name : Kaikkathetti, Kashara, Kazhavu, Koovachekki

Distribution : Southern Western Ghats (Endemic)

Bushy shrubs. Leaves simple, opposite, ovate, apex gradually acute, cordate at base, sessile; nerves obscure. Flowers fascicled in very dense many-flowered cymes; peduncles; pedicels short, 1-2 mm long. Calyx tube, campanulate, truncate at apex, obovate, blue. Style subulate. . Berry , globose.

Flowering & Fruiting : February-May

Notes : It is a Medicinal plant

318.*Memecylon talbotianum* Brandis in Talbot, Bombay List. (ed. 2) Append. 1902 & Indian Trees 336. 1906; Gamble, Fl. Pres. Madras 503(355). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 182. 2004. (Plate 11 E).

Distribution : Western Ghats (Endemic)

Trees or large shrubs; branchlets terete. Leaves opposite, decussate; elliptic to elliptic-lanceolate, drying dull yellow; midrib slightly canaliculate, lateral nerves not visible. Flowers blue, in axillary or lateral fascicles; on old branches; pedicels 3 mm long. Berry, yellow, glabrous, crowned by persistent sepals.

Flowering & Fruiting : February-May.

Herbarium:Coll.No.89.TTK/VZY/OTP/PKD, 27.01.2021., Praveenkumar K.(Fl).

319.*Memecylon umbellatum* Burm. f., Fl. Ind. 87. 1768; Gamble, Fl. Pres. Madras 504(355). 1919; E. Vajr., Fl. Palghat Dist. 202. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 183. 2004.*Memecylon edule* Roxb., Pl. Corom. t. 82.1798; C.B. Clarke in Hook. f., Fl. Brit. India 2: 563.1879p.p.; Gamble, Fl. Pres. Madras 504(356).1919.

Malayalam Name : Anjanamaram, Kayampoomaram, Kasavu.

Distribution : Peninsular India, Sri Lanka, Jawa, Malasia, Myanmar, Vietnam

Large shrubs. Leaves opposite, ovate-oblong or elliptic, coriaceous, drying yellowish green. Umbels compact, sessile or very short peduncled, many-flowered; flowers subsessile. Petals blue, elliptic-ovate to orbicular. Filaments blue; anthers. Style blue. Berry, globose, initially yellowish green; mature fruit bluish-black.

Flowering & Fruiting : February-March

Notes : It is a Medicinal plant.

320.*Osbeckia muralis* Naud., Ann. Sci. Nat. Bot. ser.3, 14: 456. 1850; Sasidh., Fl. Parambikulam WLS 129. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 184. 2004. *Osbeckia truncata* D. Don ex Wight & Arn., Prodr. 322. 1834, p.p.; C.B. Clarke in Hook. f., Fl. Brit. India 2: 514. 1879; Gamble, Fl. Pres. Madras 494(349). 1919.*Osbeckia truncata* var. kurzii C.B. Clarke in Hook. f., Fl. Brit. India 2: 514. 1879. (Plate 12 B).

Malayalam Name : Cherkulathi

Distribution : Western Ghats (Endemic)

Erect herbs; laxly villous. Leaves simple, opposite. Flowers few in terminal cymose clusters, 4-merous; bracts triangular, margins ciliate. Petals pink, to purple, ovate. Capsule globose; seeds many, minute.

Flowering & Fruiting : September-December.

LXV. MELIACEAE

321.*Aglaia elaeagnoidea* (A. Juss.) Benth., Fl. Austral. 1: 383. 1863; Sasidh., Fl. Parambikulam WLS 54. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 87. 2004.*Aglaia roxburghiana* (Wight & Arn.) Miq., Ann. Mus. Ludg.-Bat. 4: 41. 1868; Gamble, Fl. Pres. Madras 180(128). 1915.Aglaia wallichii Hiern in Hook. f., Fl. Brit. India 1: 555. 1875.*Aglaia roxburghiana* (Wight & Arn.) Miq. var. beddomei Gamble, Fl. Pres. Madras 180(129). 1915.*Aglaia roxburghiana* (Wight & Arn.) Miq. var. *courtallensis* Gamble, Fl. Pres. Madras 180(129). 1915.

Malayalam Name : Njazhal, Punyava

Distribution : Indo-Malesia to Pacific Islands

Trees, bark reddish-brown. Leaves imparipinnate, Alternate; leaflets, opposite, elliptic, elliptic-obovate. Flowers polygamodioecious, yellow, in axillary branching panicles. Fruit a berry, globose, buff coloured; seeds 1 or 2.

Flowering & Fruiting : November-August

Notes : It is a Medicinal plant.

Herbarium:Coll.No.184.PKS/SKP/OTP/PKD,18.02.2022., Praveenkumar K.(Fl).

322.*Aphanamixis polystachya* (Wall.) Parker, Indian For. 57: 486. 1931; E. Vajr., Fl. Palghat Dist. 110. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 88. 2004.*Amoora rohituka* (Roxb.) Wight & Arn. in Wight, Cat 24. 1833 & Prodr. 119. 1834; Hiern in Hook. f., Fl. Brit. India 1: 559. 1875; Gamble, Fl. Pres. Madras 181(130). 1915. (Plate 6 E).

Distribution : Tropical Asia to China

Malayalam Name : Chennelli, Chemmaram, Ponnambazham

Evergreen treesbark reddish-brown mottled with green. Leaves imparipinnate, Alternate, crowded at the end of branchlets. Flowers polygamodioecious, white; panicles axillary, drooping. Fruit a capsule 3-lobed, glabrous yellow or purplish; seeds 2 or 3, oblong, with a scarlet aril.

Flowering & Fruiting : January-December

Notes : It is a Medicinal plant. Bark is astringent. Seeds are refrigerant. Laxative and anthelmintic. Seed extract shows significant antibacterial activity. Bark is used to treat enlarged liver and spleen, tumours and abdominal complaints. Seed oil is used as liniment in rheumatism and also to treat ulcers and diseases of the ear and eyes.Timber used for furniture. Bark is used to treat enlarged liver and spleen, tumors and abdominal complaints. Seed oil is used as liniment in rheumatism and also to treat ulcers and diseases of the ear and eyes.

323.*Azadirachta indica* A. Juss., Mem. Mus. Hist. Nat. Paris 19: 221. 1830; Gamble, Fl. Pres. Madras 177(127). 1915; E. Vajr., Fl. Palghat Dist. 113. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 89. 2004.*Melia azadirachta* L., Sp. Pl. 385. 1753; Hiern in Hook. f., Fl. Brit. India 1: 544. 1875. (Plate 3 A).

Malayalam Name : Ariyaveppu, Kaippanveppu, Veppu

Distribution : Indo-Malesia, widely cultivated

Evergreen trees. Leaves imparipinnate, Alternate; lanceolate or falcate,. Flowers bisexual white, in axillary panicles. Fruit a drupe, oblong-ovoid, greenish-yellow; seed one, surrounded by a sweet pulp.

Flowering & Fruiting : February-September

Notes : It is a Medicinal plant. Timber used for building constructions, carvings, toys etc. The powdered seed or kernal is used aganist rice weevil, lesser grain borer and grubs of khapra beetle (Trogoderma granarium) of grains and bruchids of pulses. The oil from the seed is also used in some pesticides. Oil cake is a good cattle feed, manure, insecticide and nematicide. The twigs of the tree used as tooth brush by some people. Decoction of the bark is used as a tonic. Tender leaves are used to treat scabies. Oil is extracted from the seeds and is used to treat debility after child birth. Leaf paste with black pepper is given once a day for one month for the treatment of diabetes. Leaf extract and seed-oil have shown hypoglycemicactivity.

Herbarium:Coll.No.105.PKM/CVA/OTP/PKD,21.02.2021,Praveenkumar.K.(Fl)

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324.*Naregamia alata* Wight & Arn., Prodr. 117. 1834; Hiern in Hook. f., Fl. Brit. India 1: 542. 1875; Gamble, Fl. Pres. Madras 175(125). 1915; E. Vajr., Fl. Palghat Dist. 111. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 90. 2004. (Plate 12 A).

Malayalam Name : Nilanaragam, Nilanarai

Distribution : Peninsular India (Endemic)

Prostrate woody herbs. Leaves 3-foliolate; leaflets obovate, laterals oblique. Flowers axillary, solitary. Petals 5, white, spathulate. Disc annular.Capsule ovoid to subglobose, 3-valved; seeds curved, truncate at both ends.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant. Crushed roots applied to cure inflammation of naval region.

Herbarium:Coll.No.175.ANK/TCK/MKD/PKD,16.01.2022,PraveenkumarK.(Fl)

325.*Swietenia macrophylla* King in Hook., Ic. t. 1550. 1886; K.N. Subram., Fl. Thenmala Div. 59. 1995; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 91. 2004; N.C. Nair & N.P. Balakr. in P. Daniel (ed.), Fl. Kerala 1: 661. 2005.

Malayalam Name : Mahogani, Manthagani

Distribution : Native of Central and South America, widely planted

Deciduous trees; bark brown. Leaves paripinnate, Alternate. Flowers bisexual, pale yellow, in axillary panicles. Calyx lobes 5, suborbicular. Petals 5, oblong. Staminal tube 3. apically 10-lobed; stamens 10. Ovary 5-celled, ovules many; style attenuate; stigma shortly lobed. Fruit a capsule, oblong-globose, 5-valved, woody, rusty out side; seeds many, winged.

Flowering & Fruiting : April-March

Notes : It is an Exotic plant. Premium furniture wood. It is also often used for musical instruments, particularly the backs of acoustic guitars and drums shells because of its ability to produce a very deep, warm tone.

Herbarium:Coll.No.35.TKK/VZY/OTP/PKD, 28.02.2020., Praveenkumar K.(Fl).

LXVI. MENISPERMACEAE

326.*Anamirta cocculus* (L.) Wight & Arn., Prodr. 446. 1834; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 93. 1872; Dunn in Gamble, Fl. Pres. Madras 28(19). 1915; E. Vajr., Fl. Palghat Dist. 50. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 21. 2004.

Malayalam Name : Aanayamruthu, Kaipalathumka.

Distribution : Tropical Asia

Woody climbers. Leaves simple, Alternate, broadly ovate, margin entire. Flowers unisexual, many, in large drooping panicles on mature stem. Sepals 6 in 2 rows, ovate, yellow. Petals absent. Fruit of 1-3 drupes, obliquely ovoid, gibbous, purple-black, smooth; seeds 1, black, glabrous.

Flowering & Fruiting : August-December

Notes **:** It is a Medicinal plant.

327.*Cissampelos pareira* L., Sp. Pl. 1031. 1753 p.p.; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 103. 1872; Dunn in Gamble, Fl. Pres. Madras 30(21). 1915.*Cissampelos pareira* L. var. hirsuta (Ham. ex DC.) Forman, Kew Bull. 22: 356. 1968; E. Vajr., Fl. Palghat Dist. 50. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 21. 2004.*Cissampelos hirsuta* Ham. ex DC., Syst. Nat. 1: 535. 1817.

Malayalam Name : Karanakodi, Malathangi, Pambuveru

Distribution : Tropics and Subtropics of Old World

Slender climbers. Leaves simple, Alternate, broadly ovate. Male flowers in axillary cymes, sessile. Female flowers in bracteate racemes. Drupe globose, red, hairy; seeds 1, black.

Flowering & Fruiting : July-September

Notes : It is a Medicinal plant.

328.*Cyclea fissicalyx* Dunn in Gamble, Fl. Pres. Madras 31(22). 1915 & Bull. Misc. Inform. Kew 1916: 60. 1916; Manilal, Fl. Silent Valley 5. 1988; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 22. 2004.*Cyclea peltata* Miers, Contr. Bot. 3: 236. 1871, non (Lam.) Hook. f. & Thoms. 1855. (Plate 7 B).

Distribution : Southern Western Ghats (Kerala) (Endemic)

Climbers. Leaves simple, Alternate, peltate, ovate, glabrous. Male panicle; flowers subsessile, interruptedly spicate or collected into heads, glabrous, shortly pedicelled; peduncles slender; bracts foliar. Female panicles racemose, much shorter than the male. Sepal oblong, glabrous. Petal orbicular, much shorter than the sepal. Ovary pilose. Drupe pilose.

Flowering & Fruiting : January-April.

329.*Cyclea peltata* (Burm. f.) Hook. f. & Thoms., Fl. Ind. 201. 1855 & in Hook. f., Fl. Brit. India 1: 104. 1872p.p; Dunn in Gamble, Fl. Pres. Madras 31(22). 1915; E. Vajr., Fl. Palghat Dist. 51. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 22. 2004.*Dioscorea peltata* Burm.f., Fl. Indica 215. 1768. Lam., Encycl. 4: 96. 1797.*Cyclea burmannii* (DC.) Hook. f. & Thoms., Fl. Ind. 201. 1855 & in Hook. f.,

Fl. Brit. India 1: 104. 1872.*Clypea burmannii* Wight & Arn., Prodr. 1: 14. 1834.*Cyclea arnottii* Miers, Ann. Mag. Nat. Hist. ser. 3, 18: 19.1866; Dunn in Gamble, Fl. Pres. Madras 31(22).1915.*Cocculus burmannii* DC., Syst. Nat. 1: 517. 1817.

Malayalam Name : Padakizhangu, Padathali, Padavalli.

Distribution : Indian Subcontinent to Indo-China

Slender climbing shrubs. Leaves simple, Alternate, peltate, ovate; glabrous or with a few scattered hairs above. Male panicles rachis pubescent; flowers densely packed towards the branch tips, sessile, densely hairy. Male flowers; sepals hairy outside; petals glabrous. Female flowers in axillary racemes as long as the petiole; sepal-1, hairy; petal-1, hairy; carpel one, densely hairy. Drupe globose, white when ripe; endocarp muriculate in lines on the back.

Flowering & Fruiting : April-May

Notes : It is a Medicinal plant. Crushed or sliced tuberous roots, taken along with a little salt for stomach pain.

Herbarium:Coll.No.53.KPS/ANR/MKD/PKD,30.05.2020.,Praveenkumar K.(Fl).

330.*Diploclisia glaucescens* (Blume) Diels in Engl., Pflanzenreich Menispermac. 225. 1910; Dunn in Gamble, Fl. Pres. Madras 28(20). 1915; Manilal, Fl. Silent Valley 6. 1988; Sasidh., Fl. Parambikulam WLS 9. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 23. 2004.*Cocculus glaucescens* Blume, Bijdr. 25. 1825.*Cocculus macrocarpus* Wight & Arn., Prodr. 13. 1834; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 101. 1872.

Malayalam Name : Vattavalli, Vattoli

Distribution : Indo-Malesia and China

Lianas. Leaves simple, Alternate, broadly ovate to orbicular, glaucous below. Flowers unisexual, yellow, in large much-branched, glabrous, pendulous panicles. Drupe yellow, nearly sessile, obovate-oblong, compressed, tapering to a short neck, glaucous; style-scar conspicuous, basal; endocarp transversely ridged.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant.

331.*Stephania japonica* (Thunb.) Miers, Ann. Mag. Nat. Hist. ser.3, 18: 14. 1866, var. japonica; Dunn in Gamble, Fl. Pres. Madras 29(21). 1915; Manilal, Fl. Silent Valley 6. 1988; Sasidh., Fl. Parambikulam WLS 9. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 23. 2004.*Menispermum japonicum* Thunb., Fl. Japan 193. 1784.*Cissampelos hernandifolia* Willd., Sp. Pl. 4: 861. 1806.*Stephania hernandifolia* (Willd.) Walp., Rep. 1: 96. 1842; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 103. 1872.*Cyclea hernandifolia* (Willd.) Wight & Arn., Prodr. 14. 1834.

Malayalam Name : Patakilammu, Patavalli, Paasichedi

Distribution : Indo-Malesia and East Asia

Slender climbers. Leaves simple, Alternate, peltate, ovate or suborbicular, puberulous beneath, margins entire. Male flowers in axillary, sessile or subsessile, greenish or white. Female inflorescence similar to male ones; sepals 3-5, oblong or elliptic; petals 3-5, suborbicular; staminodes absent; carpel 1, ovoid; stigmas 3-lobed. Drupes globose or obovoid, with basal stylar scar, red; endocarp transversely ridged.

Flowering & Fruiting : March-September

Notes : Juice of leaves are taken frequently for the treatment of malarial fever and also for the general fever.

332.*Tiliacora acuminata* (Poir.) Miers ex Hook. f. & Thoms., Fl. Ind. 187.1855; Dunn in Gamble, Fl. Pres. Madras 28(20).1915; E. Vajr., Fl. Palghat Dist. 52. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 23. 2004.*Menispermum acuminatum* Poir. in Lam., Encycl. 4: 101. 1797.*Tiliacora racemosa* Coleb., Trans. Linn. Soc. London 13: 67. 1821; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 99. 1872.

Malayalam Name : Vallikanjiram

Distribution : India, Sri Lanka and South East Asia

Woody climbers. Leaves Alternate, ovate or lanceolate, truncate, cordate, glabrous. Inflorescences axillary, panicles, pubescent. Male flowers yellow.

Female flower solitary; sepals and petals as in male ones. Drupes on branched carpophores, oblong to obovoid, glabrous, red when ripe; endocarp reticulate.

Flowering & Fruiting : April-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.96.PNS/KPM/PTB/PKD, 12.02.2021., Praveenkumar K.(Fl).

333.*Tinospora cordifolia* (Willd.) Miers, Ann. Mag. Nat. Hist. 2, 7: 38. 1855; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 97. 1872; Dunn in Gamble, Fl. Pres. Madras 26(19). 1915; E. Vajr., Fl. Palghat Dist. 52. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 23. 2004.*Menispermum cordifolium* Willd., Sp. Pl. 4: 826. 1806.*Cocculus cordifolius* (Willd.) DC., Syst. Nat. 1: 517. 1817. (Plate 5 F).

Malayalam Name : Amrthu, Amrutavalli, Chitamruthu, Siddamirth

Distribution : Indian Subcontinent to Indo-China.

Glabrous climbers. Leaves simple, Alternate, broadly cordate to cordate. Inflorescences appearing with leaves, drooping. Male flowers: greenish-yellow. Female flowers: petals broadly spathulate. Drupes 1-3, red, endocarp thinly bony, broadly elliptic to subrotund in outline.

Flowering & Fruiting : January-June

Notes : It is a Medicinal plant.

334.*Tinospora sinensis* (Lour.) Merr., Sunyatsenia 1: 193. 1934 & Trans. Am. Phil. Soc. Philad. 24. 158. 1935; E. Vajr., Fl. Palghat Dist. 52. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 24. 2004.*Campylus sinensis* Lour., Fl. Cochinch. 113. 1790.*Tinospora malabarica* (Lam.) Hook. f. & Thoms., Fl. Ind. 183. 1855 & in Hook. f., Fl. Brit. India 1: 96. 1872.*Tinospora tomentosa* (Coleb.) Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 96. 1872. (Plate 8 G).

Malayalam Name : Pothamruthu, Kattamruthu, Peiamruthu

Distribution : Indian Subcontinent to China

Large climbing shrubs; outer bark papery peels off in thin stripes. Leaves simple, Alternate. broadly ovate. Inflorescence racemose. Male flowers: 3-5

together, pedicelled; sepals 6 in 2 whorls, outer smaller, inner obovate; petals 6 smaller; stamens 6, free, anthers orbicular. Female flowers: sepals and petals similar to male flowers; carpels 3, stigma bilobed, staminodes 6, clavate. Drupe ovoid, 1 or 2 together, red, glabrous.

Flowering & Fruiting : February-June

Notes : It is a Medicinal plant.

LXVII.MENYANTHACEAE

335.*Nymphoides hydrophylla* (Lour.) Kuntze, Rev. Gen. Pl. 2: 429. 1891; E. Vajr., Fl. Palghat Dist. 297. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 300. 2004.*Menyanthes hydrophylla* Lour., Fl. Cochinch. 129. 1790.*Nymphoides cristata* (Roxb.) Kuntze, Rev. Gen. Pl. 1: 429. 1891; Manilal & Sivar., Fl. Calicut 175. 1982.*Limnanthemum cristatum* (Roxb.) Griseb., Gen. Sp. Gent. 342. 1839; Hook. f., Fl. Brit. India 4: 131. 1883; Gamble, Fl. Pres. Madras 883(620). 1923.

Malayalam Name : Cheruthettambel, Neythel

Distribution : Indo-Malesia and South China

Rhizomatous annuals or perennial herbs. Leaves all fertile, floatingovate to orbicular. Flowers bisexual and female, in umbellate clusters of 10-20 at the junction of the branch. Corolla white with a yellow throat; tube with a ring of glandular hairs at the throat. Capsule oblong; seeds 4-6, discoid, brown.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant.

LXVIII. MIMOSACEAE

336.*Acacia auriculiformis* A. Cunn. ex Benth. in Hook.'s London J. Bot. 1: 377. 1842; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 158. 2004. (Plate 14 A).

Malayalam Name : Acacia

Distribution : Native of Tropical Australia

Trees. Phyllodes Alternate, linear. Flowers bisexual, yellow, in axillary spikes. Pod, flat, glabrous, woody and much twisted in irregular coils; seeds black, with orange-yellow coloured aril.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant

Herbarium:Coll.No.150.PKA/AKR/PTB/PKD,11.08.2021.,Praveenkumar K.(Fl).

337.*Acacia mangium* Willd., Sp. Pl. 4: 1053.1806; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 159. 2004.*Racosperma mangium* (Willd.) Pedley, Austrobaileya 2: 352. 1987.

Malayalam Name : Manjium

Distribution **:** Australia, introduced to tropics and subtropics

Trees. Phyllode simple, Alternate, elliptic-oblong or lanceolate, base attenuate. Flowers bisexual, white, in loose axillary spikes. Calyx gamosepalous. Corolla gamopetalous, deeply lobed. Stamens many; filaments free. Ovary puberulous. Pod, woody, twisting into spiral cluster on dehiscence; seeds brown, ovate-oblong, attached to the pod by orange-red folded funicle.

Flowering & Fruiting : July-February

Notes : It is an Exotic plant.

Herbarium:Coll.No.78.PKA/AKR/PTB/PKD, 19.12.2020., Praveenkumar K.(Fl).

338.*Acacia torta* (Roxb.) Craib, Bull. Misc. Inform. Kew 1915: 410. 1915; Gamble, Fl. Pres. Madras 428(304). 1919; E. Vajr., Fl. Palghat Dist. 186. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 160. 2004.

Malayalam Name : Anthochini, Kallinja, Pattincha

Distribution : India and Pakistan

Rambling shrubs with recurved prickles. Leaves Alternate; bipinnate, pinnae in pairs. Heads, solitary or in groups of 2 or 3 in terminal panicles. Calyx long, 5-lobed. Petals oblong long. Staminal filaments long, yellow. Pod , flat, papery, yellowish-brown, densely glandular; seeds 6-8.

Flowering & Fruiting : April-December.

339.*Adenanthera pavonina* L., Sp. Pl. 384. 1753; Baker in Hook. f., Fl. Brit. India 2: 287. 1878; Gamble, Fl. Pres. Madras 418(296). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 161. 2004.

Malayalam Name : Maniadi, Manjati

Distribution : Tropical Asia to N. Australia; introduced to parts of Tropical America and Africa

Deciduous trees. Leaves bipinnate, Alternate. Flowers pale yellow, clustered in axillary spiciform racemes; linear. Pod, straight to falcate to slightly twisted, spirally coiled after dehiscence, thin, septate within, tapered at base, apex acute, glabrous; seeds to fifteen, red, smooth, shining, ellipsoid-orbicular.

Flowering & Fruiting : January-September

Notes : It is an Exotic and a Garden plant. A red dye obtained from the bark has been used for dyeing clothes. The wood is heavy, hard, strong, and durable. The heartwood is resistant to dry wood termites, being used for cabinet making, construction, paving blocks, vehicle bodies and handicrafts.

340.*Albizia chinensis* (Osbeck) Merr., Amer. J. Bot. 3: 575. 1916; E. Vajr., Fl. Palghat Dist. 187. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 161. 2004.*Albizia stipulata* (Roxb.) Boivin, Encycl. 19: 33. 1838; Baker in Hook. f., Fl. Brit. India 2: 300. 1878.*Mimosa stipulata* Roxb., Fl. Ind. 2: 549. 1832.*Albizia marginata* (Lam.) Merr., Philipp. J. Sci. 5: 23. 1910; Gamble, Fl. Pres. Madras 433(307). 1919.

Malayalam Name : Mottavaka, Ponthamvaka, Pottavaka, Vaaka

Distribution : Indo-Malesia and South China

Deciduous trees; surface brownish-grey. Leaves bipinnate, Alternate, opposite, even pinnate. Flowers bisexual, white, in globose heads, 2-6 in axillary fascicles or arranged in terminal and axillary panicles. Fruit a pod, strap shaped, flat, reddish-brown, glossy, straight or wavy along the margin, very shortly stalked, apices round or tapering, slightly bullate over the seeds; seeds 8-20, ovate, flat, dull brown.

Flowering & Fruiting : March-July

Notes : It is a Medicinal plant

341.*Albizia lebbeck* (L.) Benth. in Hook.'s London J. Bot. 3: 87. 1844; Baker in Hook. f., Fl. Brit. India 2: 298. 1878; Gamble, Fl. Pres. Madras 432(306). 1919; Sasidh., Fl. Parambikulam WLS 111. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 161. 2004.

Malayalam Name : Nenmenivaka, Kattuvaka, Karivaka, Vaka

Distribution : Indo-Malesia and South China

Deciduous trees; bark yellowish-brown. Leaves bipinnate, Alternate; pinnae 2-4 pairs, slender, glabrous,. Flowers bisexual, greenish-white, in subglobose heads solitary or 2-4 together in axillary corymbose racemes. Pod flat, oblong, compressed, straw coloured, base and apex obtuse, turgid above the seeded region; seeds 8-12,ovate, dull dark brown, flattened.

Flowering & Fruiting : March-December

Notes : It is a Medicinal plant. Bark is used as soap.

342.*Albizia odoratissima* (L. f.) Benth. in Hook.'s London J. Bot. 3: 88. 1844; Baker in Hook. f., Fl. Brit. India 2: 299. 1878; Gamble, Fl. Pres. Madras 431(306). 1919; E. Vajr., Fl. Palghat Dist. 187. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 161. 2004.

Malayalam Name : Karivaka, Kunnivaka, Nellivaga, Pulivaka

Distribution : Native of Indian Subcontinent to S.E. Asia, introduced to Jawa, Malaya and parts of Africa

Deciduous trees; bark greyish-brown to dark brown. Leaves bipinnate, Alternate; pinnae 2-8 pairs, opposite, even pinnate,. Flowers bisexual, white, in globose heads forming terminal panicles. Pod flat, strap-shaped, with parallel margin or often some portion constricted; seeds 6-12, oblong, orbicular, compressed.

Flowering & Fruiting : April-January

Herbarium: Coll.No.04.CTK/VPZ/PTB/PKD,12.01.2020, Praveenkumar K.(Fl).

343.*Leucaena leucocephala* (Lam.) de Wit, Taxon 10: 54. 1961 & 24: 352. 1975; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 163. 2004.*Mimosa leucocephala* Lam., Encycl. 1: 12. 1783.*Leucaena glauca* Benth., Hook. J. Bot. 4: 416. 1842; Baker in Hook. f., Fl. Brit. India 2: 290. 1878; Gamble, Fl. Pres. Madras 419(297). 1919.*Leucaena latisiliqua* (L.) Gillis, Taxon 23: 190. 1974,p.p.; E. Vajr., Fl. Palghat Dist. 190. 1990.

Malayalam Name : Ippilippil, Subaul

Distribution : Originally from Tropical America; now Pantropical

Trees. Leaves bi-pinnate, Alternate; slender, pulvinate, puberulent. Flowers bisexual, greenish-white, in axillary umbels, globose, solitary or 2-3 together. Pod, linear-oblong, flat, dehiscent; seeds glossy.

Flowering & Fruiting : November-April

Notes : It is an Exotic plant.

344.*Mimosa pudica* L., Sp. Pl. 518. 1753; Baker in Hook. f., Fl. Brit. India 2: 291. 1878; Gamble, Fl. Pres. Madras 421(298). 1919; E. Vajr., Fl. Palghat Dist. 188. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 163. 2004. (Plate 13 E).

Malayalam Name : Theendarmani, Thottalvadi, Thottavadi

Distribution : Native of South America; now Pantropical

Diffuse herbs; with reflexed bristles and scattered, curved prickles. Leaves Alternate, pinnae 2 pairs; leaflets pairs, oblong, overlapping. Heads solitary or binate, axillary, globose; peduncle hairy; bracts linear. Flowers numerous, pink. Calyx minute. Corolla campanulate; lobes pubescent outside. Stamens 4, exserted. Fruit a lomentum flat, margin with recurved prickles; seeds 3-5, subrhombic.

Flowering & Fruiting : July-January

Notes : It is a Medicinal and an Exotic plant. Paste of leaves mixed with breast milk applied locally for headache Leaves are made into a paste with saliva and the paste is applied on the wound caused by prickles or thorns. Leaf paste is applies for hydocele.

Herbarium:Coll.No.188.SCM/MTL/PTB/PKD,19.02.2022,Praveenkumar K.(Fl).

345.*Samanea saman* (Jacq.) Merr., J. Wash. Acad. Sc. 6: 47. 1916; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 164. 2004.*Mimosa saman* Jacq., Fragm. Bot. 15, t. 9. 1800.*Albizia saman* (Jacq.) F.Muell., Sel. Pl. Indust. Cult. 12. 1891.*Enterolobium saman* (Jacq.) Prain ex King, J. Asiat. Soc. Bengal 66: 252. 1898.*Pithecellobium saman* (Jacq.) Benth. in Hook's. Lond. J. Bot. 3: 216. 1844. (Plate 15 G).

Malayalam Name : Mazhamaram, Urakamthoongimaram

Distribution : Native of Central and South America; widely planted in the tropics as avenue tree

Trees with spreading crow. Leaves bipinnate, Alternate, bipinnate; pubescent. Flowers bisexual, pinkish-white, subsessile, in dense heads, solitary or 2-3 together in the axils of upper leaves; pubescent.Pod 12 indehiscent, slightly flattened and depressed between the seeds, sutures thickened, glossy brown, mesocarp pulpy, light brown, sticky, septate between the seeds; seeds 16-20, smooth, brown, glossy.

Flowering & Fruiting : March-May

Notes : It is an Exotic and a Garden plant.

346.*Xylia xylocarpa* (Roxb.) Taub., Bot. Centralbl. 47: 395. 1891; Gamble, Fl. Pres. Madras 417(295). 1919; E. Vajr., Fl. Palghat Dist. 190. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 164. 2004.*Mimosa xylocarpa* Roxb., Pl. Corom. t. 100. 1798.*Xylia dolabriformis* sensu Bedd., Fl. Sylv. t. 186. 1872, non. Benth. 1842; Baker in Hook. f., Fl. Brit. India 2: 286. 1878 p.p.

Malayalam Name : Irul, Irulpool, Irumullu, Kadamaram, Pangal

Distribution : Indo-Malesia

Deciduous trees; bole often fluted. Leaves bipinnate, Alternate. Flowers bisexual, sessile, dull yellow, in axillary globose heads. Pod flat, broadly falcate, woody, compressed, dehiscent, septate between the seeds; seeds oblong, compressed, brown, shining.

Flowering & Fruiting : February-December

Notes : Seeds eaten

LXIX. MOLLUGINACEAE

347.*Paramollugo nudicaulis* (Lam.) Thulin, Taxon 65(4): 786. 2016.*Mollugo nudicaulis* Lam., Encycl. 4: 234. 1797; C.B.Clarke in Hook. f., Fl. Brit. India 2: 664. 1879; Gamble, Fl. Pres. Madras 553(390). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 202. 2004.

Distribution : Paleotropics

Malayalam Name : Ullukkumarunnu chedi

Glabrous acaulescent herbs. Leaves forming a rosette, obovate to broadly spathulate. Cymes scapose, several, bi or trichotomously branched, spreading to ascending. Sepals 5, broadly ellipsoid to oblong, subequal. Stamens 3-5. Ovary oblong, 3-lobed, 3-celled; stigmas 3, sessile, flat, spreading, papillose. Capsule valves 3, rounded at apex; seeds black, plump, very oblique-reniform, with a slightly caruncle or thickened attachment, surface thickly tuberculate.

Flowering & Fruiting : May-September

Notes : It is a Medicinal plant.

Herbarium: Coll.No.196.ANK/TCK/MKD/PKD, 18.03.2022, Praveenkumar K.(Fl).

LXX. MORACEAE

348.*Antiaris toxicaria* Lesch., Ann. Mus. Natl. Hist. Nat. Paris 16: 478, t. 22. 1820; King in Hook. f., Fl. Brit. India 5: 537. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1367(957). 1928; Sasidh., Fl. Parambikulam WLS 307. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 437. 2004.

Malayalam Name : Maravuri, Nettavil

Distribution : Indo-Malesia

Lofty deciduous trees. Leaves simple, Alternate, bifarious, oblong, elliptic-oblong or ovate-oblong. Flowers unisexual, greenish-yellow, minute, in spikes. Male receptacle axillary, tomentose; peduncle velvety; receptacle surrounded by

imbricating bracts. Female flowers solitary in an involucre of few connate bracts. Fruit a drupe pyriform or obovoid, fleshy, scarlet, velvety.

Flowering & Fruiting : January-April

Notes : It is a Medicinal and a Poison plant. Bark of the tree is smoothened to prepare Maravuri, the cloth used in the past.

349. ***Artocarpus heterophyllus*** Lam., Encycl. 3: 209. 1789; E. Vajr., Fl. Palghat Dist. 443. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 437. 2004. *Artocarpus integrifolius* Wight, Icon. Pl. Ind. Orient. t. 678. 1840; King in Hook. f., Fl. Brit. India 5: 541. 1888, non L. f. 1781; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1369(957). 1928.

Malayalam Name : Plavu, Kottachakka

Distribution **:** Widely cultivated in the tropics, origin is probably South India

Evergreen trees. Leaves simple, Alternate, obovate, obovate-oblong, or elliptic-ovate. Flowers unisexual, minute, yellowish-green, in spikes enclosed by spathe-like bracts. Fruit a sorosis oblong, tuberculate, tubercles conical yellowish-green; seeds elliptic-oblong, smooth, glossy.

Flowering & Fruiting : November-April

Notes : It is an Edible plant. There are two distinct groups of varieties of jack fruit one is Varikka and other is Kooza / Pazha. Apart from this, a distinct variety Thamarachaka is also well known. Varikka is the most commonly used variety. Muttanvarikka, Thenvarikka, and Kumbanadanvarikka are well known local varieties in Kerala. It is used to made many products like chips, jams, jelly, wine, squash, pickle, papad etc. Fruit and seeds are used to make curries. Timber is used for multi-purpose constructions, furniture, body of musical instrument veena and the drums mridangam.

Herbarium: Coll.No.06.Pacheerikkavu,13.01.2020, Praveenkumar K.(Fl).

350.***Artocarpus hirsutus*** Lam., Encycl. 3: 210. 1789; King in Hook. f., Fl. Brit. India 5: 541. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1369(957). 1928; E.

Vajr., Fl. Palghat Dist. 443. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 437. 2004. (Plate 6 F).

Malayalam Name : Anjili, Ayani, Anniliayari

Distribution : Southern Western Ghats and Sri Lanka

Evergreen trees. Leaves simple, Alternate, broadly ovate, obovate or elliptic, glabrous above. Flowers unisexual, minute, yellowish-green. Fruit a sorosis globose or ovoid, echinate, yellow when ripe, the spines cylindrical, straight, hispid, perforate at the apex for filiform style; seeds ovoid, white.

Flowering & Fruiting : December-March

Notes : It is an Edible plant. Timber used in ship building, furniture, building construction etc. Fruits are edible. An infusion of the bark is applied to cure small pimples and cracks on the skin, and the powdered bark is used to heal sores.

Herbarium:Coll.No.05.ANK/TCK/MKD/PKD,12.01.2020,Praveenkumar K.(Fl).

351.*Ficus amplissima* J.E. Smith in Rees, Cyclop. 14: n.1. 1810; E. Vajr., Fl. Palghat Dist. 445. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 438. 2004.*Ficus tsiela* Roxb. ex Buch.-Ham., Trans. Linn. Soc. London 15: 149. 1826; King in Hook. f., Fl. Brit. India 5: 515. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(953). 1928.

Distribution : Sri Lanka, Maldives and Peninsular India

Large spreading trees; aerial roots few more. Leaves simple, Alternate, glabrous, coriaceous. Flowers unisexual; figs monoecious, paired, axillary, subsessile, crowned towards the end of branchlets; flowers of 4 kinds; male flowers dispense, few; tepals 2 in pedicellate flowers and 3 in sessile flowers, reddish, ovate acute, free, margin scarious; stamen 1, included; anthers oblong, parallel, unequal; female flower sessile, tepals 3-4, reddish, ovate acute, free. Fig red or purple when ripe; achenes smooth.

Flowering & Fruiting : September-December.

352.*Ficus benghalensis* L., Sp. Pl. 1059. 1753; King in Hook. f., Fl. Brit. India 5: 499. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 361(952). 1928; E. Vajr., Fl. Palghat Dist. 450. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 438. 2004.*Urostigma bengalense* (L.) Gasp., Nov. Gen. Fici 7. 1844.

Malayalam Name : Alamaram, Peraal.

Distribution : Indian subcontinent; widely grown as avenue tree

Spreading trees. Leaves simple, Alternate, spiral, ovate, glabrescent above, minutely pubescent beneath. Flowers unisexual; inflorescence a fig, sessile, in axillary pairs, flowers of 4 kinds; male flowers dispersed with female, rather numerous near the mouth of the receptacles; pedicel, connective brown; female flowers sesile; gall flowers similar to female but pedicellate. Fig ripening orange to red, achenes globose-ellipsoid, dark brown.

Flowering & Fruiting : May-August

Notes : It is a Medicinal and an Edible plant. Fruits edible. Latex is applied on teeth for tooth ache and pains of gums. The aerial root is used as tooth brush. Aqueous extract of the bark and aerial roots given for treatment of diabetes. The aerial roots are considered to heal fractured bones. The bark is the main content of the ayurvedic preparation 'Nalpamarakoottu'.

Herbarium:Coll.No.206.EKK/KGD/CTR/PKD,11.08.2022,Praveenkumar K.(Fl).

353.*Ficus exasperata* Vahl, Enum. Pl. 2: 197. 1805; E. Vajr., Fl. Palghat Dist. 447. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 439. 2004.*Ficus asperrima* Roxb., Fl. Ind. 3: 554. 1832; King in Hook. f., Fl. Brit. India 5: 522. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1366(955). 1928.

Malayalam Name : Parakam, Therakam

Distribution : East Africa, Arabia, India and Sri Lanka

Deciduous trees. Leaves simple, laxly Alternate spiral to opposite or subdistichous, elliptic, ovate, oblong-lanceolate, or obovate. Flowers unisexual; fig, axillary, solitary, harshly scabrid; peduncle small scattered, flowers of 4 kinds; male flowers sessile, ostiolar, in 1-2 rings. female flowers sessile;

puberulous, stigma clavate; gall flowers sessile to pedicellate white hairy, ovary white, sessile, style terminal, puberulous, stigma dilated. Fig yellow or purple when ripe; achene oblong, slightly keeled, reticulate.

Flowering & Fruiting : February-April.

Herbarium:Coll.No.27.SCM/MTL/PTB/PKD, 20.02.2020, Praveenkumar K.(Fl).

354.*Ficus hispida* L. f., Suppl. Pl. 442. 1781; King in Hook. f., Fl. Brit. India 5: 522. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1367(956). 1928; E. Vajr., Fl. Palghat Dist. 447. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 440. 2004.*Ficus oppositifolia* Roxb., Pl. Corom. t. 124. 1799.

Distribution : South China, Indo-Malesia to Australia

Malayalam Name : Kattatthi, Parakam, Peyatti, Thondi

Trees. Leaves simple, opposite, oblong, obovate, elliptic-oblong, ovate-oblong or obovate-oblong. Flowers unisexual; inflorescence a fig, dioecious, fascicled on trunk or on elongated pendulous or trailing leafless branches, male flowers and gall flowers in same receptacle; female flowers in separate; male flowers ostiolar, in 2 rings. female flowers sessile or stalked; perianth short, tubular, glabrous; ovary depressed-globose, superior, red-brown; style hairy; stigma clavate; gall flowers same as female but larger and distinctly stalked. Fig yellow; achenes lenticular.

Flowering & Fruiting : September-May.

Herbarium: Coll.No.106.KMK/TCK/MKD/PKD, 21.02.2021, Praveenkumar K.(Fl).

355.*Ficus krishnae* C. DC., Curtis Bot. Mag. 132: t. 8092. 1906. *Ficus benghalensis* L. var. krishnae (C. DC.) Corner, Gard. Bull. Singapore 21 (1): 14. 1965.

Malayalam Name : Krishnan-aal

Distribution **:** India and Sri Lanka

Small much branched trees. Leaves Alternate, ovate-lanceolate, stipules coriaceous. Fig depressed globose, pubescent, in sessile pairs, androgynous, in

axillary pairs, red when ripe, with 3 basal bracts. Male flowers near the mouth, staminate florets stipitate. Gall flowers sepals 4, style short. Syconus red, globose.

Flowering & Fruiting : January-July

Notes : It is an Exotic and a Garden plant.

356.*Ficus microcarpa* L. f., Suppl. Pl. 442. 1781; E. Vajr., Fl. Palghat Dist. 448. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 440. 2004.*Ficus retusa* King, Ann. Roy. Bot. Gard. (Calcutta) 1: 50. tt.61 & 84 P.1887, non L. 1767 & in Hook. f., Fl. Brit. India 5: 511. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(952). 1928.*Ficus retusa* var. *nitida* sensu King in Hook. f., Fl. Brit. India 5: 511. 1888, non Thunb. 1781-1801; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(952). 1928.

Malayalam Name : Ithi, Ithiyal, Kallithi

Distribution : Indo-Malesia to Pacific Islands and South China

Evergreen trees, usually epiphytic. Leaves simple, Alternate, elliptic, elliptic-ovate, elliptic-obovate or obovate. Flowers unisexual; figs, sessile, in axillary pairs, globose, glabrous, orifice plane or slightly raised. Flowers of 4 kinds; male flowers numerous; sessile or shortly pedicelled; tepals 3, subspathulate, free; female flowers sessile, sepals 3, spathulate, ovary superior, smooth, stigma cylindrical or clavate; gall flowers pedicellate; tepals 3, broadly spathulate. Fig globose, glabrous, purple with yellow shades when ripe; achenes smooth.

Flowering & Fruiting : March-May

Notes **:** It is a Medicinal plant

357.*Ficus racemosa* L., Sp. Pl. 1060. 1753; E. Vajr., Fl. Palghat Dist. 448. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 440. 2004.*Ficus glomerata* Roxb., Pl. Corom. t. 123. 1799; King in Hook. f., Fl. Brit. India 5: 535. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1364(954). 1928.

Distribution : Indo-Malesia to Australia and China

Malayalam Name **:** Atthi, Atthi-al, Jantuphalam, Udumbaram

Deciduous trees. Leaves simple, Alternate, ovate, obovate, elliptic-oblong, elliptic-lanceolate, elliptic-ovate or oblong-ovate. Flowers unisexual; figs on short leafless branches or warty tubercles of trunk or on larger branches, subglobose to pyriform, smooth, flowers of unisexual, 4 kinds; male flowers near the mouth of receptacles, in 2-3 rings. Fig orange, pink or dark crimson; achene granulate.

Flowering & Fruiting : February-May

Notes : It is a Medicinal plant. Ripe fruits eaten. The roots are useful in treating dysentery. The bark is useful as wash for wounds, also recommended in diseases of urinary tract. The bark is one of the content of ayurvedic preparation 'Nalpamarakoottu'.

Herbarium: Coll.No.22.PBK/KVS/ALT/PKD, 12.02.2020, Praveenkumar K.(Fl).

358.*Ficus religiosa* L., Sp. Pl. 1059. 1753; King in Hook. f., Fl. Brit. India 5: 513. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1363(953). 1928; E. Vajr., Fl. Palghat Dist. 450. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 441. 2004. *Urostigma religiosum* (L.) Gasp., Ric. Caprifico 82. t. 7. ff.1-5. 1845. (Plate 2 D).

Malayalam Name : Arayal,

Distribution : East Himalayas; planted and naturalised elsewhereand neighbouring countries

Deciduous trees; exudation milky. Leaves simple, Alternate, new leaves pink broadly ovate, base truncate or subcordate. Flowers unisexual; figs, sessile, axillary, in pairs, obovoid or globose, flowers of 4 kinds; male flowers ostiolar, sessile, in one ring. Fig ripening pink, purple or black; achenes smooth.

Flowering & Fruiting : November-February

Notes : It is a Medicinal, an Exotic and a Garden plant. A paste of the powdered bark is a good absorbent for inflammatory swellings and good for burns. Leaves and tender shoots have purgative properties and are also recommended for wounds and skin diseases. The bark is one of the content of ayurvedic preparation 'Nalpamarakoottu'.

Herbarium:Coll.No.163.PBK/KVS/ALT/PKD,21.12.2021, Praveenkumar K.(Fl).

359.*Ficus tsjakela* Burm. f., Fl. Ind. 227. 1768; King in Hook. f., Fl. Brit. India 5: 514. 1888, "tjakela"; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(953). 1928; E. Vajr., Fl. Palghat Dist. 450. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 441. 2004.

Malayalam Name : Aal, Chela, Karaal, Kara

Distribution : India, Sri Lanka and Indochina

Deciduous trees, often epiphytic. Leaves simple, Alternate, elliptic-oblong or ovate-oblong, glabrous, glossy above. Flowers unisexual; figs, sessile, in clusters of 2-6, on very short crowded tubercles in the axils of the leaves or most frequently at the scars of fallen leaves, flowers of 4 kinds; male flowers few, sessile, only near the mouth of receptacle. Fig yellowish-white and dotted, sessile rarely very shortly peduncled; achenes smooth.

Flowering & Fruiting : March-April.

Herbarium: Coll.No.60.PBK/KVS/ALT/PKD, 10.10.2020, Praveenkumar K.(Fl).

360.*Ficus virens* Ait., Hort. Kew (ed. 1) 3: 451. 1789; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 442. 2004;; Sasidh., Fl. Parambikulam WLS 314. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 442. 2004.*Urostigma wightianum* Miq. in Hook.'s London J. Bot. 6: 566. 1847.*Ficus infectoria* Roxb. var. wightiana (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1: 63. t.77. 1887; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(953). 1928.*Ficus wightiana* (Miq.) ex Miq., Ann. Mus. Lugd.-Bat. 3: 286. 1867; King in Hook. f., Fl. Brit. India 5: 516. 1888.*Ficus infectoria* Roxb., Fl. Ind. 3: 551. 1832, non Willd. 1806; King in Hook. f., Fl. Brit. India 5: 515. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1362(953). 1928.

Malayalam Name : Chakkila, Cherla, Pepar

Distribution : Indio-Malesia to Solomon Islands

Deciduous treesoften epiphytic. Leaves simple, Alternate, elliptic, oblong, oblong-ovate or ovate, base round, truncate or subcordate Flowers unisexual; inflorescence a figs, axillary, paired, globose, often obconical; peduncle slender, pubescent; basal bracts 3, ovate, acute, persistent, flowers of 4 kinds; male

flowers ostiolar, sessile, in 2-3 rings. Fig white and fleshed with pink when ripe; achenes smooth.

Flowering & Fruiting : January-March.

361.*Streblus asper* Lour., Fl. Cochinch. 615. 1790; King in Hook. f., Fl. Brit. India 5: 489. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1353(947). 1928; E. Vajr., Fl. Palghat Dist. 450. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 442. 2004.*Epicarpurus orientalis* Blume, Bijdr. 488. 1826.

Malayalam Name : Paruvamaram, Paruka, Paruva.

Distribution : Tropical Asia and China

Evergreen trees. Leaves simple, Alternate elliptic,Flowers unisexual, greenish-yellow. Male in axillary heads, tepals 4, free, lanceolate. Female flowers axillary, solitary or 2-5 in a cluster; peduncle puberulous bracts and bracteoles ovate, puberulous; tepals 4, ovate, concave, puberulous,; stigmatic arms glabrous. Fruit a drupe, globose, obscurely 2-humped, yellow to orange, tepals persistent; seed one globose, greyish-white.

Flowering & Fruiting : January-October

Notes : It is a Medicinal plant. Juice/extract of leaves and roots are given after child birth for anemia.

Herbarium:Coll.No.180.TAK/KDB/PKD/PKD,12.02.2022,Praveenkumar K.(Fl).

LXXI. MYRSINACEAE

362.*Embelia tsjeriam-cottam* (Roem. & Schult.) DC., Trans. Linn. Soc. London 17: 131. 1834; Gamble, Fl. Pres. Madras 753(529). 1921; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 266. 2004.*Ardisia tsjeriam-cottam* Roem. & Schult., Syst. Veg. 4: 518. 1819.*Embelia villosa* Wall. ex Roxb., Fl. Ind. 2: 289. 1824; Gamble, Fl. Pres. Madras 753(529). 1921.*Embelia robusta* sensu C.B. Clarke in Hook. f., Fl. Brit. India 3: 515. 1882, non Roxb. 1832.*Embelia acutipetala* (Lam. ex Hassk.) M.R. Almeida & S.M. Almeida, J. Bombay Nat. Hist. Soc. 81: 741. 1984; E. Vajr., Fl. Palghat Dist. 264. 1990.*Embelia basaal* (Roem. & Schult.) A. DC., Trans. Linn. Soc. London 17: 131. 1834; Gamble, Fl. Pres. Madras 753(529). 1921.*Ardisia basaal* Roem. & Schult.,

Syst. Veg. 4: 517. 1819.*Embelia viridifolia* sensu (A. DC.) C.B. Clarke, Hook.f., Fl. Brit. India 3: 516. 1882, non Scheff.1867. **Primulaceae** (APG).

Malayalam Name : Ammimuriyan, Cheriyannattam, Eeshaal

Distribution : South and South East Asia

Deciduous shrubs. Leaves simple, Alternate, elliptic-obovate, attenuate at base, margin serrulate. Racemes axillary, appear along with leaves; peduncle brown pubescent.Corolla yellow with a thick callous at base inside; lobes punctate. Anthers with red gland at the back. Ovary globose; stigma truncate. Fruits subglobose, red, tipped by the style.

Flowering & Fruiting : February-March

Notes : It is a Medicinal plant.

LXXII. MYRTACEAE

363.*Psidium guajava* *L.*, Sp. Pl. 470. 1753; Duthie in Hook.f., Fl. Brit. India 2: 468. 1878, "guayava"; Gamble, Fl. Pres. Madras 472(334). 1919; E. Vajr., Fl. Palghat Dist. 201. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 175. 2004. (Plate 15 E).

Malayalam Name : Adakkapazham, Pera, Perakka

Distribution : Originally from Tropical America; now naturalised in the tropics

Small trees; stem smooth with pealing bark. Leaves simple, opposite, hirsute on both sides when young. Cymes axillary, 1-3-flowered. Petals 4, white, broadly ovate, caducous. Stamens many. Berry globose or ovoid, crowned by persistent calyx lobes; seeds many, embedded in white or pink-red fleshy pulp.

Flowering & Fruiting : March-May

Notes : It is a Medicinal, an Exotic and an Edible plant. Fruits are edible. Guva is a riche natural source of Vitamin C. It is also good source of fibers, carbohydrates, minerals etc. It is used for making guva cheese, guva jelly and guva necter.

Herbarium:Coll.No.84.ANK/TCK/MKD/PKD,28.12.2020,Praveenkumar K.(Fl).

364.*Syzygium caryophyllatum* (L.) Alston in Trimen, Handb. Fl. Ceylon 6: (Suppl.) 116. 1931; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 176. 2004. *Myrtus caryophyllata* L., Sp. Pl. 472. 1753.*Syzygium caryophyllaeum* sensu Gamble, Fl. Pres. Madras 480(339).1919, non Gaertn. 1788.*Eugenia caryophyllaea* Wight, Icon. Pl. Ind. Orient. t. 540. 1842; Duthie in Hook.f., Fl. Brit. India 2: 490. 1878. (Plate 8 F).

Malayalam Name : Cherujara, Kani, Karinjara, Kurumkani.

Distribution : South India and Sri Lanka

Trees; bark thick, reddish-brown. Leaves simple, opposite, obovate or obovate-oblong, glabrous. Flowers white in terminal corymbose cymes, inflorescence branches moderately thick, ascending. Calyx turbinate, no thick disc. Petals calyptrate. Stamens numerous, bent inwards at the middle when in bu. Ovary inferior, 2-celled, ovules many; style 1; stigma simple. Fruit a berry, globose, purple-black.

Flowering & Fruiting : February-January

Notes : It is an Edible plant.

Herbarium:Coll.No.178.ANK/TCK/MKD/PKD,25.01.2022,PraveenkumarK.(Fl)

365.*Syzygium cumini* (L.) Skeels, U. S. DA. Bur. Pl. Industr. Bull. 248: 2. 1912, var. cumini; E. Vajr., Fl. Palghat Dist. 199. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 176. 2004.*Myrtus cumini* L., Sp. Pl. 471. 1753.*Eugenia jambolana* Lam., Encycl. 3: 198. 1789; Duthie in Hook.f., Fl. Brit. India 2: 499. 1879.*Syzygium jambolanum* (Lam.) DC., Prodr. 3: 259. 1828; Gamble, Fl. Pres. Madras 481(340). 1919.

Malayalam Name : Njara, Njaval

Distribution : Indo-Malesia to Australia

Medium sized trees; bark gray-white. Leaves simple, opposite to subopposite ovate. Panicles on leafless nodes. Flowers subsessile. Petals 4, white, calyptrate. Stamens many. Berry 1. obovoid, or oblong, deep blue or bluish-purple.

Flowering & Fruiting : December-April

Notes : It is a Medicinal and an Edible plant. Ripe fruits eaten. Leaf and bark juice, and seed powder is given for treatment of diabetes. The leaves are antibacterial and are used for strengthening the teeth and gums. Timber used in building constructions.

366. ***Syzygium malaccense*** (L) Merr. & Perry, J. Arnold Arbor. 19: 215. 1938; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 178. 2004; Sunil & Sivad., Fl. Alappuzha Dist. 290. 2009; Ratheesh, Fl. Stud. Wayanad Dist. 365. 2009. *Eugenia malaccensis* L., Sp. Pl. 470. 1753; Duthie in Hook.f., Fl. Brit. India 2: 471. 1878.

Malayalam Name: Chuvannachamba, Pananeerjamba, Pomerac

Distribution : Native of Malaysia, cultivated in other parts of Tropical Asia

Trees; bark grey-brown, smooth. Leaves simple, opposite. Flowers bisexual, large. Calyx tube lobes round, unequal. Petals obovate-orbicular, pink large, glandular, suborbicular. Stamens, pink, bent inwards in middle in bud. Ovary inferior, ovules many; style long. Fruit a berry, to pink.

Flowering & Fruiting : February-June

Others : It is an Exotic, a Garden and an Edible plant

367.*Syzygium zeylanicum* (L.) DC., Prodr. 3: 260.1828; Gamble, Fl. Pres. Madras 479(338). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 179. 2004.*Myrtus zeylanica* L., Sp. Pl. 472. 1753.*Eugenia zeylanica* (L.) Wight, Ill. Ind. Bot. 2: 15. 1841; Duthie in Hook.f., Fl. Brit. India 2: 485. 1878.*Syzygium zeylanicum* (L.) DC. var. *lineare* (Wall.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.): 115.1931; N. Mohanan & Sivad., Fl. Agasthyamala 266. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 179. 2004.

Malayalam Name : Chaliyakkani, Kattuvayanilla, Poochappazham,

Distribution : Madagascar and Indo-Malesia

Large shrubs to small trees, bark black. Leaves simple, opposite, elliptic-lanceolate,. Flowers in axillary and terminal cymes, small, white; pedicel slender. Calyx tube campanulate, greyish, gland-dotted; lobes 5, ovate. Petals 5,

free, deciduous, white. Stamens many, free, bent inwards at the middle when in bud; no thickened staminal disc. Ovary inferior, 2-celled, ovules many. Fruit a berry, globose, white, gland-dotted, crowned with calyx segments.

Flowering & Fruiting : January-April

Notes : It is an Edible plant.

Herbarium: Coll.No.59.EPN/KVR/CTR/PKD, 19.08.2020, Praveenkumar K.(Fl).

LXXIII. NELUMBONACEAE

368.*Nelumbo nucifera* Gaertn., Fruct. 1: 73. t. 19. f. 2. 1788; Vajr., Fl. Palghat Dist. 53. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 25. 2004.*Nymphaea nelumbo* L., Sp. Pl. 511. 1753.*Nelumbium speciosum* Willd., Sp. Pl. 2: 1258. 1779; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 116. 1872; Dunn in Gamble, Fl. Pres. Madras 34(24). 1915.

Malayalam Name : Aravindam, Thamara, Chenthamara, Venthamara

Distribution : South and East Asia to far eastern Russia and to Australia

Perennial aquatic rhizomatous herbs. Leaves Alternate, orbicular, entire or wavy at margin, glaucous on both surfaces. Flowers projecting above water level, rose-pink, white or white at base and pink at tips, rarely creamy yellow; minutely prickly. Fruiting carpels ellipsoid, seeds ovoid-oblong, black.

Flowering & Fruiting : August-January

Notes : It is a Medicinal, a Garden and an Edible plant. There are many horticultural varieties with varying number of petals and the colour of flowers.

LXXIV. NYCTAGINACEAE

369.*Boerhavia diffusa* L., Sp. Pl. 3. 1753; Gamble, Fl. Pres. Madras 1162(814). 1925; E Vajr., Fl. Palghat Dist. 383. 1990. *Boerhavia repens* L., Sp. Pl. 3. 1753; Hook. f., Fl. Brit. India 4: 709. 1885.*Boerhavia procumbens* Banks ex Roxb., Fl. Ind. 1: 148. 1820. (Plate 4 B).

Malayalam Name : Thavizhama, Thazhuthama.

Distribution : Tropical and Subtropical regions

A very variable, diffusely branched prostrate herb with a stout woody root stock. Leaves simple, unequal, ovate, obtuse, undulate along margins. Flowers 4-10 together, in axillary or terminal, peduncled umbels; bracts 5, ovate, glandular. Perianth red or pink. Stamens 3. Capsule clavate, 5-ribbed, viscid glandular.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.203.PNK/KVR/CTR/PKD,15.04.2022,Praveenkumar K.(Fl).

370.*Pisonia aculeata* L., Sp. Pl. 1026. 1753; Hook. f., Fl. Brit. India 4: 711. 1885; Gamble, Fl. Pres. Madras 1163(815). 1925; Sasidh., Fl. Parambikulam WLS 252. 2002.

Malayalam Name : Karindhu, Kodimullaram

Distribution : Pantropics

Armed shrubs or small trees, spines axillary, recurved, branchlets adpressed, pubescent. Leaves opposite and Alternate, ovate, obtuse, base cuneate, chartaceous. Umbels axillary; pubescent; bracteoles ovate, pubescent; perianth funnel shaped, 10-lobed, Alternately long and short; ovary seated on a disc, 1-celled, one ovuled.

Flowering & Fruiting : March-April.

LXXV. NYCTANTHACEAE

371.*Nyctanthes arbor-tristis* L., Sp. Pl. 6. 1753; Hook. f., Fl. Brit. India 3: 603. 1882; Gamble, Fl. Pres. Madras 792(556). 1923; M. Mohanan & Henry, Fl. Thiruvanthapuram 286. 1994. **Oleaceae** (APG).

Malayalam Name : Pavizhamalli, Pavizhamulla

Distribution : South and South East Asia

Large shrub or small tree. Leaves decussate-opposite, ovate or those near the flowers. Inflorescence axillary or forming a large, terminal, leafy; flowers sessile,

pleasantly fragrant, each subtended by 2 broadly ovate or elliptic, bracts which almost conceal the calyx. Fruit an orbicular compressed capsule; seeds 1 or 2.

Flowering & Fruiting : September-April

Notes : It is a Medicinal, an Exotic and a Garden plant.

Herbarium:Coll.No.225.TVK/PTK/ALT/PKD,15.03.2023, Praveenkumar K.(Fl).

LXXVI. NYMPHAEACEAE

372.*Nymphaea nouchali* Burm. f. var. *caerulea* (Savi.) Verdc., Fl. Trop. E. Afr. Nymphaeace 7. 1989. *Nymphaea caerulea* Savi., Dec. Egypt. 3: 74. 1793; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 24. 2004.

Malayalam Name : Neela-ambel

Distribution **:** Native of North Africa, introduced as a garden plant

Aquatic herbs. Leaves subpeltate, suborbicular, retuse, glabrous. Flowers fragrant; Petals sky-blue; outer ones lanceolate-elliptic, obtusely cucullate; inner ones elliptic, acute; filaments of outer stamens, yellow; that of inner stamens, yellow; anthers blue; stigmatic appendages oblong, yellow, incurved after pollination.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and a Garden plant

LXXVII. OLEACEAE

373.*Chionanthus mala-elengi* (Dennst.) P.S. Green subsp. *mala-elengi*, Bull. Bot. Surv. India 26. 124. 1984; E. Vajr., Fl. Palghat Dist. 273. 1990; Sasidh., Biodivers. Doc. Kerala - Fl. Pl.: 275. 2004.*Forsythia mala-elengi* Dennst., Schluss. Hort. Malab. 12,21, 31. 1818.*Linociera malabarica* Wall. ex G. Don, Gen. Hist. 4: 53. 1837-1838; C.B.Clarke in Hook. f., Fl. Brit. India 3: 607. 1882; Gamble, Fl. Pres. Madras 794(558). 1923.*Chionanthus malabaricus* (Wall. ex G. Don) Bedd., Fl. Sylv. t. 239. 1872. (Plate 6 H).

Malayalam Name : Kallidala, Mala-elengi, Perumbal

Distribution **:** Peninsular India (Endemic)

Trees. Leaves simple, opposite, obovate or elliptic-oblong. Flowers bisexual, yellowish-white, sessile, in axillary clusters. Fruit a drupe, ellipsoid, slightly curved, acute, ridged.

Flowering & Fruiting : December-April

Notes : It is a Medicinal plant.

374.*Jasminum angustifolium* (L.) Willd., Sp. Pl. 1: 36. 1797, var. *angustifolium*; C.B. Clarke in Hook. f., Fl. Brit. India 3: 598. 1882; Gamble, Fl. Pres. Madras 790(555). 1923; Sasidh., Biodivers. Doc. Kerala - Fl. Pl.: 276. 2004.*Nyctanthes angustifolia* L., Sp. Pl. 6. 1753.

Malayalam Name : Kattumallika, Kattumulla

Distribution : India and Sri Lanka

Evergreen, slender woody twiners, or straggling shrub. Leaves simple, opposite, ovate-lanceolate-narrowly lanceolate. Inflorescence glabrous, terminal on side shoots. Calyx tube, lobes, filiform, minutely puberulent on the inner surface. Corolla hypocrateriform, white with exterior of tube often pinkish, at least in bud, fragrant, lobes, narrow, acute. Fruit a paired berry, , black when ripe.

Flowering & Fruiting : November-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.225.EPN/KVR/CTR/PKD,12.02.2021, Praveenkumar K.(Fl).

375.*Jasminum coarctatum* Roxb., Fl. Ind. 1: 91. 1820; P.S. Green, Kew Bull. 58: 289. 2003. *Jasminum rottlerianum* Wall. ex A. DC. in DC., Prodr. 8: 305. 1844; C.B. Clarke in Hook. f., Fl. Brit. India 3: 593. 1882; Gamble, Fl. Pres. Madras 789(555). 1923; E. Vajr., Fl. Palghat Dist. 275. 1990; Sasidh., Biodivers. Doc. Kerala - Fl. Pl.: 278. 2004.*Jasminum rottlerianum* Wall. ex A. DC. var. glabrior C.B. Clarke in Hook. f., Fl. Brit. India 3: 593. 1882.

Malayalam Name : Vellakattumulla, Kattumulla

Distribution : India to China and Indo-China

Climbing shrubs, pubescent or tawny villous. Leaves simple, opposite, ovate-lanceolate. Cymes terminal and axillary. Calyx tube linear, curled, pubescent. Corolla white, oblong, obtuse, twisted. Ovary; style, stigma clavate. Fruit didymous, subglobose, purple.

Flowering & Fruiting : January-June.

376.*Jasminum sambac* (L.) Ait., Hort. Kew (ed. 1) 1: 8.1789; C.B. Clarke Hook. f., Fl. Brit. India 3: 591.1882; Gamble, Fl. Pres. Madras 788(554). 1921; Sasidh., Biodivers. Doc. Kerala - Fl. Pl.: 278. 2004.*Nyctanthes sambac* L., Sp. Pl. 6. 1753.

Malayalam Name : Arimulla,kuttimulla, Kudamulla

Distribution : Sri Lanka through India to Myanmar

Scandent or suberect shrubs. Leaves opposite or in whorls of three, entire, elliptic or broad elliptic to sub-orbicular. Flowers fragrant, in few-flowered terminal cymes. Calyx V-shaped, pubescent. Corolla white, simple or double, oblong, acute or obtuse, or orbicular under cultivation. Berry simple or didymous, globose, black when ripe, surrounded by the suberect subulate calyx teeth.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and a Garden plant

377.*Tetrapilus dioicus* (Roxb.) L.A.S. Johnson, Contr. New South Wales Natl. Herb. 2: 408. 1957. *Olea dioica* Roxb., Fl. Ind. 1: 105. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 3: 612. 1882; Gamble, Fl. Pres. Madras 796(559). 1923; E. Vajr., Fl. Palghat Dist. 276. 1990; Sasidh., Biodivers. Doc. Kerala - Fl. Pl.: 279. 2004. (Plate 12 G).

Malayalam Name : Edana, Edala, Karivetti.

Distribution : India to Myanmar (Endemic)

Trees. Leaves simple, opposite, elliptic, elliptic-oblong or elliptic lanceolate. Flowers polygamo-dioecious, creamy-white, small, in panicles, axillary or from leafless nodes, pedicellate, male panicles larger and denser than hermaphrodite. Fruit a drupe ellipsoid, blue; seeds ca. 6 x 4 mm, minutely muriculate.

Flowering & Fruiting : November-April

Not**es** **:** It is a Medicinal plant.

Herbarium:Coll.No.127.ATK/TCK/MKD/PKD,16.04..2021,PraveenkumarK.(Fl)

LXXVIII. ONAGRACEAE

378.*Ludwigia hyssopifolia* (G. Don) Exell, Garcia de Orta 5: 471. 1957; E. Vajr., Fl. Palghat Dist. 208. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 191. 2004.*Jussiaea hyssopifolia* G. Don, Gen. Hist. 2: 693. 1832.*Jussiaea linifolia* Vahl, Ecolg. Amer. 2: 32. 1798, non *Ludwigia linifolia* Poir., 1813; Gamble, Fl. Pres. Madras 1875(1298). 1936.*Jussiaea suffruticosa* Ridley, J. Bot. 59: 257. 1921, non L.*Fissendocarpa linifolia* (Vahl) Bennet, J. Bombay Nat. Hist. Soc. 67: 126. 1970.

Malayalam Name : Neergrampu

Distribution : Pantropical

Herbs; branchlets angled or winged. Leaves simple, Alternate, glabrous, membranous. Flowers solitary, axillary. Petals 4, obovate, yellow. Stamens 8; filaments unequal. Ovary 4-celled; ovules many; stigma 4-lobed. Capsule, linear, terete, 8-ribbed; seeds dimorphic, uniseriate and embedded in endocarp below and pluriseriate and free above.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.127.ASK/TCK/MKD/PKD,22.02.2021,PraveenkumarK.(Fl).

LXXIX. OPILIACEAE

379.*Cansjera rheedei* Gmel., Syst. 1: 280. 1791, 'rheedii'; Hook. f., Fl. Brit. India 1: 582. 1875; Gamble, Fl. Pres. Madras 193(138). 1915; Sasidh., Fl. Parambikulam WLS 60. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 94. 2004.

Malayalam Name : Cheruvallikanjiram

Distribution : India through Malaya to Hong Kong and North Australia

Climbing shrubs. Leaves Alternate, ovate, rugose. Flowers in Inflorescence axillary spikes. Flowers, greenish-yellow, bisexual; bracts minute, linear-lanceolate. Fruit a drupe, crimson red, seed 1.

Flowering & Fruiting : November-February.

LXXX. ORCHIDACEAE

380.*Acampe ochracea* (Lindl.) Hochr., Bull. New York Bot. Gard. 6: 270. 1910; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 443. 2004.

Distribution : Indo-Malesia

Epiphytic herbs. Leaves distichous, oblong, keeled. Flowers yellow, long, axillary, racemose panicles. Petals, obovate-oblong or spathulate, with red transverse bands. Lip, pinkish white. Spur long, oblong with two septa within. Column long with erect anterior horns. Pedicel with ovary long, sparsely pubescent.

Flowering & Fruiting : February-April.

381. *Acampe praemorsa* (Roxb.) Blatt. & McCann, J. Bombay Nat. Hist. Soc. 35: 495. 1932; E. Vajr., Fl. Palghat Dist. 465. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 443. 2004.

Malayalam Name : Maravazha, Taliyamaravada, Upputhali

Distribution : India, Sri Lanka and Seychelles

Robust epiphytic shrubs. Leaves distichous, linear, sheathing at base. Corymbs leaf-opposed. Flowers. Sepals and petals, ovate-lanceolate, creamy yellow with reddish-brown transverse bands. Capsule long, cylindrical, ribbed.

Flowering & Fruiting : March-April

Notes : It is a Medicinal plant

382.*Crepidium resupinatum* (G. Forst.) Szlach., Fragm. Florist. Geobot. Suppl. 3: 131. 1995.*Epidendrum resupinatum* G. Forst., Fl. Ins. Austr. 61. 1786.*Seidenfia rheedei* (Sw.) Szlach., Syst. Orch. 3: 122. 1995; Sasidh., Fl. Parambikulam WLS 337. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 473. 2004.*Malaxis rheedei* Sw.,

Kongl. Vetensk. Acad. Nya Handl. 21: 235. 1800; Manilal, Fl. Silent Valley 293. 1988.*Microstylis rheedei* (Sw.) Lindl., Gen. Sp. Orchid. Pl. 21. 1830p.p.; Hook. f., Fl. Brit. India 5: 690. 1890.

Malayalam Name : Jeevakam, Pachilaperumal

Distribution : India to Thailand, China and Sri Lanka

Pseudobulbs fusiform. Leaves sessile, broadly ovate to ovate, plicate. Inflorescence racemose, lanceolate to oblong-lanceolate. Flowers many, greenish yellow, yellow to orange-yellow or purple. Ovary with pedicel.

Flowering & Fruiting : July-September

Notes : It is a Medicinal plant.

Herbarium:Coll.No.54.EKT/TCK/MKD/PKD,31.05.2020, Praveenkumar K.(Fl).

383.*Vanda tessellata* (Roxb.) Hook. ex D. Don in Loud., Hort. Brit. 372.1830; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1445(1010). 1928; Manilal, Fl. Silent Valley 307. 1988; Sasidh., Fl. Parambikulam WLS 339. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 476. 2004.*Epidendrum tessellatum* Roxb., Pl. Corom. t. 42. 1795.*Vanda roxburghii* R. Br., Bot. Reg. 6. t. 506. 1820; Hook. f., Fl. Brit. India 6: 52. 1890.

Malayalam Name : Arathamaravazha, Maravazha, Maravanchi

Distribution : India, Myanmar, China and Sri Lanka

Scandent epiphytic shrubs. Leaves 2-ranked, oblong, recurved conduplicate. Racemes axillary; flowers yellow. Lip bluish dotted with purple.

Flowering & Fruiting : June-September

Notes : It is a Medicinal plant The juice of the leaves and aerial root mixed with neem oil and garlic is used to treat ear pain.

LXXXI. OROBANCHACEAE

384.*Aeginetia indica* L., Sp. Pl. 632. 1753; Hook. f., Fl. Brit. India 4: 320. 1884; Gamble, Fl. Pres. Madras 974(685). 1924; E. Vajr., Fl. Palghat Dist. 328. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 328. 2004.

Malayalam Name : Keerippoovu

Distribution : Indo-Malesia and Japan

Parasitic leafless herbs. Flowers solitary; bracts and bracteoles absent. Calyx spathaceous, purple, glabrous. Corolla long, dark purple, two lipped. Capsule long, dehisce apically; seeds many, white, rugose.

Flowering & Fruiting : July-October.

Herbarium:Coll.No.172.KTK/TCK/MKD/PKD,10.01.2022,PraveenkumarK.(Fl).

LXXXII. OXALIDACEAE

385.*Biophytum reinwardtii* (Zucc.) Klotzsch. in Peters Reise Mossamb. Bot. 1: 85. 1861, var. reinwardtii; Hook. f., Fl. Brit. India 1: 437. 1874; Gamble, Fl. Pres. Madras 133(95). 1915; E. Vajr., Fl. Palghat Dist. 98. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 68. 2004.*Oxalis reinwardtii* Zucc., Abh. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. 1: 274. 1829-1830.

Malayalam Name : Mukkutti, Theendanazhi

Distribution : Indo-Malesia and China

Herbs, stem pubescent. Leaves crowded at apex, paripinnate. Flowers umbellate in many flowered axillary peduncles. Sepals ovate, acute-acuminate at apex, 7-nerved. Petals yellow, elliptic to oblanceolate, emarginated at apex; claw greenish, limb yellow. Fruits glandular hairy on the ribs; seeds 1 or 2 per cell, transversely ridged and tubercled.

Flowering & Fruiting : July-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.23.PKK/TCK/MKD/PKD,12.02.2020, Praveenkumar K.(Fl).

LXXXIII. PANDANACEAE

386.*Pandanus kaida* Kurz, J. Asiat. Soc. Bengal 38: 148. 1869; Manilal *et al.*, New Botanist 11: 1201. 1984; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 507. 2004; Sunil & Sivad., Fl. Alappuzha Dist. 718. 2009; R. Ansari *et al.*, Aquatic and Wetland Fl. Kerala: Flow. Pl. 633. 2016.

Malayalam Name : Kaitha, Paikaitha

Distribution : India to Indo-china and China (Endemic)

Shrubs. Mature leaves linear-ensiform, gradually narrowed to the long flagelliform apex. Female inflorescence: at the apex nearly trigonal.Fruit oblong-ellipsoid, rounded-trigonal. Phalanges cuneate, up to 45-50 mm long, 10-20(-24) mm thick, usually 5-7 angled, apex low-pyramidal, centrally produced into the 1-4 short, stocky styles.

Flowering & Fruiting : September-November.

LXXXIV. PAPAVARACEAE

387.*Argemone mexicana* L., Sp. Pl. 508. 1753; Hook.f. & Thoms. in Hook. f., Fl. Brit. India 1: 117. 1872; Dunn in Gamble, Fl. Pres. Madras 35(25). 1915; E. Vajr., Fl. Palghat Dist. 54. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 25. 2004. (Plate 17 B).

Malayalam Name : Bhramadanthi, Ponnummam

Distribution : Originally from West Indies; now naturalised in the tropics

Divaricately branched erect herbs. Leaves Alternate, dissected, semi-amplexicaul, membranous, margins spiny. Flowers terminal, solitary, yellow. Capsule oblong, spiny, dehiscing apically downwards; seeds blackish-brown, rugose.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, an Exotic, a Poison and a Weed plant.

LXXXV. PASSIFLORACEAE

388.*Adenia hondala* (Gaertn.) de Wilde, Blumea 15: 265. 1967; E. Vajr., Fl. Palghat Dist. 210. 1990; Sasidh., Fl. Parambikulam WLS 133. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 192. 2004; *Granadilla hondala* Gaertn., Fruct. 2: 480. t.180. f.10. 1791**.**

Malayalam Name : Karimuthukku, Muthukku.

Distribution : South India and Sri Lanka

Climbers with tuberous roots. Leaves palmate, oblong, membranous, with large circular sessile glands between lobes. Flowers monoecious, in axillary cymes. Calyx long, lobes five, ovate. Petals five, linear-oblong, ciliate, attached at the rim of calyx tube. Capsule, globose, 3-valved, orange coloured.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant.

389.*Passiflora edulis* Sims in Curtis, Bot. Mag. t. 1989. 1818; Gamble, Fl. Pres. Madras 524(370). 1919; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 192. 2004. (Plate 15 D).

Malayalam Name : Passion fruit.

Distribution : Native of Tropical America; introduced in India

Climbing shrubs. Leaves Alternate, lobes oblong. Flowers axillary, solitary, white. Berry globose, greenish-yellow, yellow or pale purple.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic and an Edible plant.

390.*Passiflora foetida* L., Sp. Pl. 959. 1753; Gamble, Fl. Pres. Madras 524(370). 1919; E. Vajr., Fl. Palghat Dist. 210. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 193. 2004.

Malayalam Name :Ammummapazham, Bonchikkaya, Chadayan,
Distribution : Native of Tropical America; now naturalised in India, China and Africa

Herbaceous vines. Leaves suborbicular to ovate, cordate at base. Flowers axillary, often solitary. Petals white, shorter than calyx lobes. Coronal segments in 2 whorls; outer coronal hairs many. Berries subglobose, yellow, subtended by the bracts and bracteoles; seeds many, ovate, laterally compressed, pitted.

Flowering & Fruiting : July-December

Notes : It is a Medicinal, an Exotic and a Weed plant. Paste prepared from leaves and fruits are used in coating boils for 2-3 days for relief of pain and absorption.

LXXXVI. PEDAIACEAE

391.*Martynia annua* L., Sp. Pl. 618. 1753; Gamble, Fl. Pres. Madras 1003(705). 1924; E. Vajr., Fl. Palghat Dist. 336. 1990. *Martynia diandra* Gloxin, Obs. Bot. 14, t. 1. 1785; Hook. f., Fl. Brit. India 4: 386. 1884. **Martyniaceae** (APG).

Malayalam Name : Kakka-chundu, Pulinakham

Distribution : Tropical and Subtropical America; naturalised in Indian subcontinent

Erect subshrubs, glandular-hairy all over. Leaves simple, opposite, chartaceous. Racemes 7-14- flowered, at the bifurcations of the branches. Reddish-purple with yellow throat. Fruits drupaceous, ovoid, flattened somewhat dorso-ventrally, ribbed, viscid-pubescent; endocarp hard, black, with a hooked spine at tip.

Flowering & Fruiting : July-August

Notes : It is a Medicinal, an Exotic and a Weed plant.

LXXXVII. PERIPLOCACEAE

392.*Cryptolepis buchananii* R. Br. ex Roem. & Schult., Syst. Veg. 4: 409. 1819 nom. cons; Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Pres. Madras 826(580). 1923; E. Vajr., Fl. Palghat Dist. 288. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 294. 2004.*Cryptolepis dubia* (Burm. f.) M.R. Almeida, Fl. Maharashtra 3A: 221 2001.*Periploca dubia* Burm. f., Fl. Indica 70 1768. *Nerium reticulatum* Roxb., Fl. Ind. 2: 8. 1832. **Apocynaceae** (APG).

Malayalam Name : Adavivallippala, Kattupalvalli.

Distribution : Indian Subcontinent to South China and Indo-China

Climbing shrubs with milky latex. Leaves opposite, elliptic or oblong-lanceolate. Inflorescence axillary dichotomous cymes, shorter than leaves.

Flowers 5-merous, lax. Corolla greenish-yellow. Pollen granular, united in tetrads. Carpels 2, apocarpous; ovules many. Follicles 2, woody; seeds ovate-oblong, with silky coma.

Flowering & Fruiting : March-August

Notes : It is a Medicinal plant.

393.*Hemidesmus indicus* (L.) R. Br. in Ait. f., Hort. Kew (ed. 2) 2: 75. 1811, var. indicus; Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Pres. Madras 825(580). 1923; E. Vajr., Fl. Palghat Dist. 290. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 294. 2004.*Periploca indica* L., Sp. Pl. 211. 1753. **Apocynaceae** (APG). (Plate 5 A).

Malayalam Name : Nannari, Narunandi, Naruneendi.

Distribution : Indo-Malaya

Slender twiner with woody rootstock. Leaves very variable, opposite or in whorls, often variegated, elliptic-oblong to linear-lanceolate. Flowers few, subsessile, in short, axillary cymes. Corolla yellow, rotate, lobes 5, fleshy, triangular. Corona of 5 scales. Stamens 5, anthers jointed at apex, appendaged. Carpels 2, apocarpous; ovules many; styles 2; stylar apex flat. Follicles, cylindric; coma white.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant. Roots are used to treat disinclination for food. The decoction of the roots is taken in for purification of blood. It is used as an antidote for snake bite.

Herbarium:Coll.No.126.PAT/LPR/OTP/PKD, 12.04.2021, Praveenkumar K.(Fl).

LXXXVIII. PIPERACEAE

394. *Peperomia leptostachya* Hook. & Arn., Bot. Beechey Voy.: 96. 1832.*Peperomia dindygulensis* Miq., Syst. Piperac. 122. 1843; Hook. f., Fl. Brit. India 5: 98. 1886; Gamble, Fl. Pres. Madras 1210(847). 1925; E. Vajr., Fl. Palghat Dist. 396. 1990.*Peperomia blanda* (Jacq.) Kunth, Nov. Gen. Sp. 1: 67, t.13. 1815.*Piper blandum* Jacq., Collect. 3: 211. 1789, var. floribunda (Miq.) Huber in

Dassan. & Fosb., Rev. Handb. Fl. Ceylon 6: 294. 1987.*Peperomia arabica* Decne. var. *floribunda* Miq., Syst. Piperac. 122. 1843.

Distribution : Tropical & Subtropical Old World

Erect terrestrial herbs with pubescent stem. Leaves opposite and ternate, elliptic to obovate. Spike slender, erect; bracts orbicular, peltate with white margins. Flowers distant. Nutlets obovoid to orbicular, acute, scaly.

Flowering & Fruiting : July-December.

395.*Peperomia pellucida* (L.) Kunth, Nov. Gen. Sp. 1: 64. 1815; Gamble, Fl. Pres. Madras 1210(847). 1925; E. Vajr., Fl. Palghat Dist. 396. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 390. 2004.*Piper pellucidum* L., Sp. Pl. 30.1753.*Peperomia exigua* (Blume) Miq., Syst. Piperac. 77. 1843; Hook. f., Fl. Brit. India 5: 97. 1886.

Malayalam Name : Mashithandu

Distribution : Native of Tropical America; now Pantropical

Delicate, glabrous annual herbs. Leaves simple, Alternate throughout, triangular ovate. Spikes solitary, terminal but frequently leaf-opposed by overtopping. Flowers scarcely immersed. Ovary with a fleshy, oblique, subapical stigma. Fruit sessile, globose-ellipsoid, with an apical stigma, longitudinally striate-undulate, blackish brown at maturity.

Flowering & Fruiting : September-December

Notes : It is an Exotic and a Weed plant.

Herbarium:Coll.No.138.PKM/CVA/OTP/PKD,23.05.2021,PraveenkumarK.(Fl).

396.*Piper longum* L., Sp. Pl. 29. 1753; Hook. f., Fl. Brit. India 5: 83. 1886; Gamble, Fl. Pres. Madras 1205(844). 1925; Sasidh., Fl. Parambikulam WLS 264. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 391. 2004.*Chavica roxburghii* Miq., Syst. Piperac. 239. 1843. (Plate 7 H).

Malayalam Name : Kattuthippali, Pippali, Thippali

Distribution : Indo-Malesia

Scandent or straggling shrubs. Leaves simple, Alternate, membranous, shining above; nerves impressed. Female spike stout, erect; peduncle; bracts peltate, orbicular. Male spike erect, slender; stamens 2. Fruit oblong; berry glabrous, black or deep red.

Flowering & Fruiting : August-January

Notes : It is a Medicinal plant.

Herbarium:Coll.No.91.PKM/CVA/OTP/PKD,02.02.2021, Praveenkumar K.(Fl).

397.*Piper nigrum* L., Sp. Pl. 28. 1753; Hook. f., Fl. Brit. India 5: 90. 1886; Gamble, Fl. Pres. Madras 1206(845). 1925; E. Vajr., Fl. Palghat Dist. 398. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 391. 2004.*Piper nigrum* L. var. hirtellosum Asokan & Ravindran, J. Econ. Tax. Bot. 10: 167. 1987; Biju in Manoharan *et al.*, Silent Valley-Whispers Reason 168. 1999. *Piper trioicum* Roxb., Fl. Ind. 1: 151. 1820; E. Vajr., Fl. Palghat Dist. 399. 1990. (Plate 8 A).

Malayalam Name : Kurumulaku, Mulakukodi, Nallamulaka

Distribution : Peninsular India, cultivated elsewhere

Glabrous climbers. Leaves simple, Alternate, nervules subparallel. Male spikes slender; female spikes; bracts united forming a cup below the flower. Flowers closely placed; stamens 2. Fruits Drupes 5 mm across, globose, smooth, fellow at first turns to deep red; stigmas 3-5, recurved.

Flowering & Fruiting : July-March

Notes : It is a Medicinal plant. Decoction of the fruits is used in fever, stomach disorder and in weakness after fever. It is also used to cure relaxed sore of throat. Powdered fruits mixed with cumin and onion are boiled in coconut oil and applied on the head for cold and fever. Dried stem and leaves are boiled in water and the water is used to take both after delivery. Piper nigrum is an extensively cultivated spice in Kerala, and 62 cultivars are recognized.

Herbarium:Coll.No.17.SCM/MTL/PKD/PKD,07.02.2020, Praveenkumar K.(Fl).

LXXXIX. PLUMBAGINACEAE

398.*Plumbago indica* L., Diss. Stickman 24.1754; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 263. 2004.*Plumbago rosea* L., Sp. Pl. (ed.2) 215. 1762; C.B. Clarke in Hook. f., Fl. Brit. India 3: 481. 1882; Gamble, Fl. Pres. Madras 745(524). 1921. (Plate 17 H).

Malayalam Name : Chethikoduveli, Chuvana-koduveli, Koduveli

Distribution : South and South East Asia and China

Shrubs with long succulent roots. Leaves simple, Alternate, oblong-elliptic. Flowers red in long purplish red to scarlet racemes. Ovary ovate-oblong, style base hairy, stigmas 5.

Flowering & Fruiting : September-March

Notes : It is a Medicinal, a Garden and a Poison plant, Root extracts are taken orally for quick delivery and also for abortion.

399.*Plumbago zeylanica* L., Sp. Pl. 151. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 3: 480. 1882; Gamble, Fl. Pres. Madras 744(524). 1921; E. Vajr., Fl. Palghat Dist. 262. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 263. 2004. (Plate 5 D).

Malayalam Name : Koduveli, Thumbakoduveli, Vellakoduveli

Distribution : Tropical and Subtropical regions

Erect subshrubs. Leaves simple, Alternate, amplexicaul at base and often auriculate. Flowers white, in elongate, terminal, often panicled racemes. Corolla; lobes obovate-oblong. Stamens 5; filaments slightly exserted above the corolla mouth; anthers blue. Ovary ellipsoid, 1-locular; stigma 5-fid. Capsule oblong, acute with 5 furrows, glandular hairy throughout.

Flowering & Fruiting : November-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.114.KVK/KTY/ALT/PKD,12.03.2021,Praveenkumar K.(Fl).

XC. POACEAE

400.*Apluda mutica* L., Sp. Pl. 82. 1753; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1750(1212). 1934; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 550. 2004. *Apluda mutica* var.

aristata (L.) Hack. ex Backer, Handb., Fl. Java 2: 54. 1928.*Apluda varia* Hack. subsp. aristata (L.) Hack. in A. & C. DC., Monogr. Phan. 6: 196. 1889; Hook. f., Fl. Brit. India 7: 151. 1896; E. Vajr., Fl. Palghat Dist. 563. 1990. *Apluda aristata* L., Amoen. Acad. 4: 303. 1759; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1950(1212). 1934.*Apluda varia* Hack. in A. & C. DC., Monogr. Phan. 6: 196. 1889; Hook. f., Fl. Brit. India 7: 150. 1896.

Distribution : Tropical Asia and Australia

Annual or perennial herb. Leaves elliptic-lanceolate or linear-lanceolate. Inflorescence a false interrupted panicle, First lemma oblong-lanceolate,. Second lemma as long as the sessile spikelet. Palea ovate. Lower glume lanceolate, chartaceous. Upper glume equal in size and texture, ovate-lanceolate. Florets more or less similar to those of sessile spikelet; upper lemma entire, unawned.

Flowering & Fruiting : October-November

Notes : It is a Weed plant.

Herbarium: Coll.No.68.KVK/KTY/ALT/PKD,07.12.2020, Praveenkumar K.(Fl).

401.*Bambusa bambos* (L.) Voss in Vilmorin, Blumengartn. 1: 1189.1896; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 554. 2004.*Arundo bambos* L., Sp. Pl. 81. 1753.*Bambusa bambos* (L.) var. *gigantea* (Bahadur & Jain) Bennet & Gaur, Thirty Seven Bamboos Inida 21. 1990; K.K.Seethal. & M.Kumar, Bamboos of India 46. 1998.*Bambusa arundinacea* (Retz.) Willd., Sp. Pl. 2: 245. 1799; Hook. f., Fl. Brit. India 7: 395. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1859(1286). 1934;E. Vajr., Fl. Palghat Dist. 566. 1990.

Malayalam Name : Mula, Pattil

Distribution : Indian Subcontinent to Indo-China

Culms from a thick stoloniferous rhizome. Leaves; linear, glabrous; ligule short. Inflorescence a compound panicle with the spikelets in heads. Spikelets 1-many-flowered, oblong, terete. Glumes broadly ovate, mucronate. Lemmas lanceolate, mucronate. Grain linearly cylindric.

Flowering & Fruiting : July-February

Notes : It is a Medicinal plant.

402.*Bambusa vulgaris* Schrad., Coll. Pl. 2: 26. 1808.*Bambusa striata* Lodd. ex Lindl. in Penny, Cyclop. 3: 357. 1835; Munro, Trans. Linn. Soc. London 26: 121. 1868; K.K.Seethal. & M.Kumar, Bamboos India 74. 1998.*Bambusa vulgaris* Schard. var. *striata* (Lodd. ex Lindl.) Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 44. 1896.

Malayalam Name : Manjamula

Distribution : Native of China and Japan, introduced elsewhere

Culms tufted, yellow, or yellow with green stripes.Leaves glabrous; ligule subentire rim; auricles small rounded lobes with a few bristles. Inflorescence usually on leafless branches from middle of the culms. Spikelets laterally flattened, perfect florets 5-10. Seed setting not common.

Flowering & Fruiting : January-April

Notes : It is an Exotic and a Garden plant.

403.*Cenchrus pedicellatus* (Trin.) Morrone, Ann. Bot. (Oxford) 106: 128. 2010.*Pennisetum pedicellatum* Trin., Mem. Acad. Sci. Petersb. ser. 6, 3: 184. 1834; Hook. f., Fl. Brit. India 7: 86. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1792(1241). 1934; E. Vajr., Fl. Palghat Dist. 585. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 587. 2004.

Malayalam Name : Poochavalanpullu, Oolappullu

Distribution : West Africa and India

Annual herbs. Leaves linear-lanceolate, acuminate, hairy or glabrous. Panicles spiciform, interrupted, fluffy-white or purplish. Involucre enclosing 1-5 spikelet. Spikelets lanceolate. Lower glume ovate-lanceolate, hyaline, silky villous; upper glume ovate-lanceolate, hyaline, faintly 5-nerved. Lower floret male or barren. Upper floret bisexual. First lemma ovate, 3-lobed at apex, hyaline, faintly 5-nerved, teeth ciliolate; palea minute, hyaline; second lemma elliptic, coriaceous.

Flowering & Fruiting : September-December

Notes : It is a Weed plant.

404.*Chrysopogon aciculatus* (Retz.) Trin., Fund. Agrost. 181. 1820; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1738(1205). 1934; E. Vajr., Fl. Palghat Dist. 568. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 559. 2004.*Andropogon aciculatus* Retz., Obs. Bot. 5: 22. 1789; Hook. f., Fl. Brit. India 7: 188. 1896.

Malayalam Name : Snehapullu, Asthrapullu

Distribution : Tropical Asia and Australia

Perennial herbs. Leaves lanceolate or ovate-lanceolate, margin serrulate. Panicle pyramidal, Sessile spikelets, lanceolate, aristate; lower glume lanceolate.Pedicelled spikelets linear-lanceolate.

Flowering & Fruiting : June-October

Notes : It is a Weed plant.

405.*Cymbopogon flexuosus* (Nees ex Steud.) Wats. in Atkins., Gaz. N. W. Prov. Ind. 392. 1882; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1756(1216). 1934; E. Vajr., Fl. Palghat Dist. 569. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 561. 2004.*Andropogon flexuosus* Nees ex Steud., Syn. Pl. Glum. 1: 388. 1854.*Andropogon nardus* L. var. flexuosus (Nees ex Steud.) Hack. in A. & C. DC., Monogr. Phan. 6: 603. 1889; Hook. f., Fl. Brit. India 7: 207. 1896.*Cymbopogon travancorensis* Bor, J. Bombay Nat. Hist. Soc. 52: 174. 1954.

Malayalam Name : Chukkunaripullu, Malabar-grass, Inchipullu,

Distribution : India and South East Asia

Perennial herbs. Leaves linear, rounded at base, flat. Inflorescence a large complex greyish panicle; branches slender, flexuous, often drooping. Racemes paired, with a spatheole beneath. Spikelets binate, one sessile, other pedicelled. Sessile spikelets elliptic-lanceolate. Grains elliptic.

Flowering & Fruiting : November-January

Notes : It is a Medicinal plant.

406.*Cynodon dactylon* (L.) Pers., Syn. Pl. 1: 85. 1805; Hook. f., Fl. Brit. India 7: 288. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1835(1270). 1934; E. Vajr., Fl. Palghat Dist. 570. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 561. 2004.*Panicum dactylon* L., Sp. Pl. 58. 1753.

Malayalam Name : Belikaruka, Balikaruka, Karuka, Karukapullu

Distribution : Tropical and warm temperate regions of the world

Slender, stoloniferous creeping perennial herbs. Leaves linear-lanceolate, acuminate, glaucous; sheaths keeled. Inflorescence of terminal, digitate 3-4 spikes; spikes 1-sided, oblong. Spikelets sessile, oblong-lanceolate, laterally compressed, 1-flowered. Grains linear.

Flowering & Fruiting : March-October

Notes : It is a Medicinal plant

Herbarium:Coll.No.01.ANK/TCK/MKD/PKD,03.01.2020,PraveenkumarK. (Fl).

407.*Cyrtococcum trigonum* (Retz.) A.Camus, Bull. Mus. Hist. Nat. Paris 27: 118. 1921; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1785(1237). 1934; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 562. 2004.*Panicum trigonum* Retz., Obs. Bot. 3: 9. 1783; Hook. f., Fl. Brit. India 7: 56. 1896.

Distribution : E. Tropical Africa, Madagascar, Tropical Asia to S. Pacific

Annuals. Culms creeping or trailing, rooting at the nodes. Leaves 1elliptic-lanceolate, base narrowed. Panicles; Spikelets obovate. Lower glume ovate, 3-nerved. Upper glume ovate, 3-nerved. Lower floret empty. Upper floret bisexual. First lemma ovate-oblong, 5-7-nerved. Second lemma deltoid, crustaceous. Palea oblong, crustaceous, 2-keeled. Stamens 3.

Flowering & Fruiting : September-October.

Herbarium:Coll.No.211.TAK/KDB/PKD/PKD,09.12.2022,Praveenkumar K.(Fl).

408.*Dactyloctenium aegyptium* (L.) P. Beauv., Ess. Agrost. 10. 1812; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1840(1273). 1934; Sasidh., Fl. Parambikulam

WLS 389. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 562. 2004. *Cynosurus aegyptius* L., Sp. Pl. 72. 1753.

Malayalam Name : Kavarapullu, Kakkakalan pullu

Distribution : Native of South America, naturalised in Paleotropics

Annual herbs. Leaves linear, membranous. Spikes 2-6, digitate, oblong. Spikelets sessile, ovate or oblong, 3-4-flowered, laterally compressed, densely imbricate, in 2 rows. Grain cobovate or triangular, transversely rugose.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, an Exotic and a Weed plant.

409.*Echinochloa colona* (L.) Link, Enum. Hort. Berol., 2: 209. 1833; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1776(1230). 1934; E. Vajr., Fl. Palghat Dist. 572. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 567. 2004.*Panicum colonum* L., Syst. Nat. (ed. 10) 870. 1759; Hook. f., Fl. Brit. India 7: 32. 1896.

Malayalam Name : Kavada

Distribution : Tropical Asia and Africa

Annual herbs. Leaves linear-lanceolate, rounded or shallowly cordate at base. Panicles spiciform; racemes 4-10. Spikelets ovate-lanceolate, greenish-yellow or purplish. Ovary oblong; stigmas pink.

Flowering & Fruiting : Throughout the year.

410.*Eleusine indica* (L.) Gaertn., Fruct. 1: 8. 1789; Hook. f., Fl. Brit. India 7: 293. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1839(1273). 1934; E. Vajr., Fl. Palghat Dist. 572. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 568. 2004.*Cynosurus indicus* L., Sp. Pl. 72. 1753.

Malayalam Name : Kattuthina, Kaatturagi

Distribution : Pantropical

Annua herbs. Leaves linear-lanceolate or linear, often folded; sheaths keeled. Spikes digitate or subdigitate,2-18. Spikelets ovate or oblong, 3-6-flowered. Lower glume lanceolate, keeled, chartaceous, 3-nerved; upper glume oblong,

keeled, chartaceous, 5-nerved. Lemmas ovate-oblong, chartaceous. Paleas oblong-elliptic. Stamens 3. Ovary elliptic; stigmas violet. Grains subglobose, deeply grooved on one side, transversely rugose.

Flowering & Fruiting : Throughout the year

Notes : It is a Weed plant.

411.*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2: 836. 1817; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1743(1208). 1934; E. Vajr., Fl. Palghat Dist. 577. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 574. 2004.*Andropogon contortus* L., Sp. Pl. 1045. 1753; Hook. f., Fl. Brit. India 7: 199. 1896.

Malayalam Name : Oosipullu, Shoolampullu

Distribution : Cosmopolitan

Perennial herbs. Leaves linear-lanceolate, ligules truncate, membranous, fimbriate. Raceme solitary, with lower homogamous spikelet pairs and upper heterogamous ones, awns forming a twisted spire. Homogamous sessile spikelets, linear-lanceolate. Heterogamous pedicelled spikelets, elliptic-lanceolate. Heterogamous sessile spikelets, linear, awned; lower glume, oblong. Heterogamous pedicelled spikelets linear; glumes not broadly winged; florets similar to those of homogamous pedicelled spikelets.

Flowering & Fruiting : October-December

Notes : It is a Weed plant

412.*Imperata cylindrica* (L.) Raeusch., Nomencl. Bot. (ed.3) 10. 1797; Sasidh., Fl. Parambikulam WLS 395. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 574. 2004. *Lagurus cylindricus* L., Syst. Nat. (ed.10) 878. 1759.*Imperata cylindrica* (L.) Raeusch. var. koenigii Dur. & Schinz., Consp. Fl. Africa 5: 694. 1894; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1708(1184). 1934.*Imperata arundinacea* Cyrillo, Pl. Rar. Neap. 2: 26. 1792; Hook. f., Fl. Brit. India 7: 106. 1896.*Imperata cylindrica* (L.) Raeusch. var. *major* (Nees) C.E. Hubb. ex Hubb. & Vaughan, Grass. Maur. 96. 1940; Manilal, Fl. Silent Valley 355. 1988.

Malayalam Name : Vidulam, Darbha, Darbhapullu

Distribution : Paleotropics

Perennials. Leaves, lanceolate or linear-lanceolate. Panicles, spiciform, cylindrical, white silky hairy. Spikelets, lanceolate, similar, pedicelled, enveloped in long silky hairs.Lower floret empty. Upper floret bisexual. First lemma, oblong-lanceolate, hyaline, apex ciliate; second lemma, elliptic-lanceolate, hyaline; palea, obovate. Stamens 2; anthers, orange-yellow. Ovary oblong.

Flowering & Fruiting : March-July

Notes : It is a Medicinal and a Weed plant. Straw used for thatching

413.*Oplismenus compositus* (L.) P. Beauv., Ess. Agrost. 54. 168. 1812; Hook. f., Fl. Brit. India 7: 66. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1778(1231). 1934; E. Vajr., Fl. Palghat Dist. 581. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 582. 2004.*Panicum compositum* L., Sp. Pl. 57. 1753.

Malayalam Name : Kozhipullu

Distribution : Pantropical

Annual herbs. Leaves elliptic-lanceolate or ovate-lanceolate. Inflorescence lax; racemes 4-8. Spikelets paired, elliptic, distant, subsessile; lower glume lanceolate, awned; upper glume ovate-elliptic, aristate. Lower floret barren. Upper floret bisexual. First lemma ovate; palea lanceolate; second lemma elliptic, subcoriaceous; palea elliptic, subcoriaceous, 2-keeled. Grains ellipsoid.

Flowering & Fruiting : Throughout the year

Notes : It is a Weed plant.

Herbarium:Coll.No.111.PKK/NLY/OTP/PKD,27.02.2021,Praveenkumar K.(Fl).

414.*Panicum notatum* Retz., Obs. Bot. 4: 18. 1786; Sasidh., Fl. Parambikulam WLS 398. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 585. 2004.*Panicum montanum* Roxb., Fl. Ind. 1: 315. 1820; Hook. f., Fl. Brit. India 7: 53. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1783(1235). 1934; E. Vajr., Fl. Palghat Dist. 583. 1990.

Distribution : South and South East Asia

Perennial herbs; nodes glabrous. Leaves lanceolate, base subcordate. Panicles lax. Spikelets ovate-oblong, acute. Lower glume ovate-lanceolate, acute; upper glume ovate. Lower floret barren. Upper floret bisexual. First lemma ovate; palea absent; second lemma ovate, subcoriaceous; palea ovate, subcoriaceous. Stamens 3; anthers yellow. Ovary elliptic; stigmas violet. Grains ovate.

Flowering & Fruiting : September-October.

415.*Perotis indica* (L.) Kuntze, Rev. Gen. Pl. 2: 787. 1891; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1814(1256). 1934; E. Vajr., Fl. Palghat Dist. 585. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 587. 2004.*Anthoxanthum indicum* L., Sp. Pl. 28. 1753.*Perotis latifolia* Ait., Hort. Kew (ed. 1) 1: 85. 1789; Hook. f., Fl. Brit. India 7: 98. 1796..

Distribution : Indo-Malesia

Annual herbs. Leaves oblong or ovate-lanceolate, base rounded, margins wavy and scabrid. Spike purplish. Spikelets linear, awned, spiral on rachis, 1-flowered, purplish. Lower glume narrowly elliptic, scabrid without, awn; upper glume linear-lanceolate, awn; lemmas linear-lanceolate; palea linear. Stamens 3. Grains linear.

Flowering & Fruiting : Throughout the year.

416.*Polytrias indica* (Houtt.) Veldkamp, Blumea 36: 180. 1991. *Ischaemum indicum* (Houtt.) Merr., J. Arnold Arbor. 19: 320. 1938, subsp. *indicum var. indicum*; C.N. Mohanan, Fl. Quilon Dist. 474. 1984; Sasidh., Fl. Parambikulam WLS 397. 2002. *Phleum indicum* Houtt., Nat. Hist. 3: 198,t.90. f.2. 1782.*Ischaemum aristatum* C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1721(1193). 1934, non L. 1753.*Ischaemum ciliare* Retz., Obs. Bot. 6: 36. 1791; Hook. f., Fl. Brit. India 7: 133. 1896.

Malayalam Name : Chenkodipullu

Distribution : Australia, south-east Asia and India, Naturalized in tropical America

Perennial herbs; tufted; nodes densely villous. Leaves linear-lanceolateacuminate, narrowed,densely villous. Sheaths keeled. Racemes 2; joints turbinate, densely ciliate. Sessile spikelets oblong or obovate, awned; lower glume oblong or obovate, slightly notched at apex, winged on either side, chartaceous, densely long pilose; upper glume, florets, lemmas and paleas similar to those of the var. indicum, but larger.

Flowering & Fruiting : October-November

Notes : It is a Weed plant.

417.*Pseudanthistiria umbellata* (Hack.) Hook. f., Fl. Brit. India 7: 220. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1749(1212). 1934; Manilal, Fl. Silent Valley 361. 1988; Sasidh., Fl. Parambikulam WLS 400. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 588. 2004.*Andropogon umbellatus* Hack. in A. & C. DC., Monogr. Phan. 6: 401. 1889.*Pseudanthistiria burmanica* Hook. f., Fl. Brit. India 7: 220. 1896; K.N. Subram., Fl. Thenmala Div. 451. 1995; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 588. 2004.

Distribution : Peninsular India and Sri Lanka

Annual herbs. Leaves elliptic or elliptic-lanceolate. Inflorescence of subumbellate fascicle or racemes. Sessile spikelets 2 in a raceme, oblong, awned; lower glume elliptic-oblong, subcoriaceous; upper glume elliptic-lanceolate; lower floret absent; upper floret bisexual; second lemma oblanceolate; awn. Stamens 3. Pedicelled spikelets 3 in a raceme, elliptic-lanceolate; lower glume elliptic-lanceolate; lower glume elliptic-lanceolate; upper glume elliptic; upper floret male. Stamens 3.

Flowering & Fruiting : November-December

Notes : It is a Weed plant.

418.*Sporobolus indicus* (L.) R. Br., Prodr. Fl. Nov. Holl. 170. 1810; Hook. f., Fl. Brit. India 7: 247. 1896; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1817(1258). 1934.*Sporobolus indicus* (L.) R. Br. var. *fertilis* (Steud.) Jovet & Guedes, Taxon 22: 164.1973; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 593. 2004.*Agrostis fertilis* Steud.,

Syn. Pl. Glum. 1: 170. 1854.*Sporobolus fertilis* (Steud.) W.D. Clayton, Kew Bull. 19: 291. 1965.

Distribution : Pantropical

Slender annual herbs; culms tufted, nodes glabrous. Leaves lanceolate, flat; margins with tubercled hairs; one margin of sheath hairy; ligule a fimbriate membrane. Panicle contracted; branches filiform. Spikelets pedicelled, lanceolate, glabrous; lower glume acute; upper glume 1-nerved; lemma hyaline; palea similar to lemma. Stamens 3.

Flowering & Fruiting : June-December.

419.*Urochloa distachyos* (L.) T.Q. Nguyen, Novosti Sist. Vyssh. Rast. 3: 13. 1966.*Panicum distachyon* L., Mant. Pl. 2: 183. 1771.*Brachiaria distachya* (L.) Stapf in Prain, Fl. Trop. Africa 9: 565. 1919; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1769(1226). 1934; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 556. 2004.*Urochloa subquadripara* (Trin.) R.D. Webster, Austral. Paniceae: 252. 1987.*Brachiaria subquadripara* (Trin.),Hitchc., Lingnan Sci. J. 7: 214. 1931.*Panicum subquadripara* Trin., Gram. Panic.: 145. 9. 1826.*Brachiaria miliiformis* (J. Presl ex C. Presl) A. Chase, Contrib. U.S. Nat. Herb. 22: 35. 1920; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1769(1226). 1934; E. Vajr., Fl. Palghat Dist. 567. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 556. 2004.*Panicum miliforme* J. Presl ex C. Presl, Reliq. Haenk. 1: 300. 1830; Hook. f., Fl. Brit. India 7: 37. 1896.

Distribution : Africa, India, Sri Lanka and Thailand

Annuals or perennial herbs. Leaves lanceolate or elliptic-lanceolate. Racemes 2 or rarely 3, hairy or puberulous below the rachis. Spikelets elliptic, solitary. triquetrous. Lower floret empty. Upper floret bisexual. Grain ovoid, compressed.

Flowering & Fruiting : May-June

XCI. POLYGALACEAE

420.*Polygala bolbothrix* Dunn in Gamble, Fl. Pres. Madras 58(42). 1915; E. Vajr., Fl. Palghat Dist. 64. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 34. 2004.*Polygala*

ciliata sensu Wight & Arn., Prodr. 38. 1834, non L. 1753.*Polygala ramaswamiana* Mukerjee var. palniensis Mukerjee, J. Bombay Nat. Hist. Soc. 53: 56. 1955 & Bull. Bot. Soc. Bengal 12: 38. 1958. (Plate 12 C).

Distribution : Southern Western Ghats (Endemic)

Diffuse herbs. Leaves lower obovate; upper liner-lanceolate, cuneate, margin ciliate. Racemes 2-4-flowered; bracts 1, elliptic-oblanceolate, ciliate. Flowers yellow. Outer sepals ovate, acute, densely hairy; inner sepals ovate, acuminate. Dorsal petal; crest, dichotomous. Stamens 8; sheath cleft at apex. Capsule densely bulbous based hairy along the margins; seeds oblong, black hairy; caruncle with 2 long and one short.

Flowering & Fruiting : January-May

XCII. PONTEDERIACEAE

421.*Pontederia crassipes* Mart., Nov. Gen. Sp. 1: 9. t. 4. 1823.*Eichhornia crassipes* (Mart.) Solms. in A. & C.DC., Monogr. Phan. 4: 527.1883; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1530(1069). 1928; E. Vajr., Fl. Palghat Dist. 512. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 45. 2004. (Plate 13 F).

Malayalam Name : Kulavazha, Kakapola

Distribution : South America; now naturalised in the Paleotropics

Floating aquatic herbs. Leaves simple, broadly ovate to rhomboid, entire. Inflorescence 6-12 flowered racemes. Flowers lilac, tinged blue. Perianth tube green, . Fruit setting not noticed.

Flowering & Fruiting : November-February

Notes : It is an Exotic and a Weed plant.

Herbarium: Coll.No.32.TAK/KDB/PKD/PKD,23.02.2020, Praveenkumar K.(Fl).

XCIII. PORTULACACEAE

422.*Portulaca oleracea* L., Sp. Pl. 445. 1753; Dyer in Hook. f., Fl. Brit. India 1: 246. 1874; Dunn in Gamble, Fl. Pres. Madras 66(47). 1915; E. Vajr., Fl. Palghat

Dist. 68. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 37. 2004.*Portulaca oleracea* L. var. *linearifolia* Sivar. & Manilal, New Botanist 4: 30. 1977.

Malayalam Name : Karicheera, Kozhuppacheera.

Distribution : Pantropical

Annual glabrous, fleshy herbs. Leaves Alternate or subopposite, often crowded at ends of branches. Flowers sessile, terminal, surrounded by a cluster of crowded leaves. Sepals connate at base. Petals 4 or 5, connate at base, yellow. Stamens 7-12; filaments. Capsules obovoid to ovoid, enveloped by marcescent corolla, dehiscing transversely in middle; seeds many, reniform, granular, dull black.

Flowering & Fruiting : June-September

Notes : It is a Medicinal plant. Leaves used as vegetable; paste of leaves applied to burn injuries.

423.*Talinum portulacifolium* (Forssk.) Asch. ex Schweinf., Weinf., Bull. Herb. Boiss. 4. App. 172. 1896; E. Vajr., Fl. Palghat Dist. 68. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 38. 2004.*Orygia portulacifolia* Forssk., Fl. Aeg.-Arab. 103. 1775.*Portulaca cuneifolia* Vahl, Symb. Bot. 1: 33. 1790.*Talinum cuneifolium* (Vahl) Willd., Sp. Pl. 2: 864.1799; Hook. f., Fl. Brit. India 1: 247. 1874; Gamble, Fl. Pres. Madras 66(48). 1915.*Talinum indicum* Wight & Arn., Prodr. 356. 1834. **Talinaceae**(APG).

Distribution : Pantropical

Malayalam Name : Badhalacheera, Vassalacheera, Sambarcheera

Erect semi-succulent, glabrous herbs; rootstock tuberous. Leaves subsessile, Alternate, obovate or oblanceolate. Inflorescence terminal, paniculate. Flowers bracts linear. Capsules globose; seeds ovoid, black, striate.

Flowering & Fruiting : February-August

Notes : It is an Exotic and an Edible plant.

Herbarium:Coll.No.222.KPB/MLK/ALT/PKD,30.02.2023,Praveenkumar K.(Fl).

XCIV. RANUNCULACEAE

424.*Clematis zeylanica* (L.) Poir., Encycl. Suppl. 2. 296. 1811.*Atragene zeylanica* L., Sp. Pl. 542. 1753.*Naravelia zeylanica* (L.) DC., Syst. Nat. 1: 167. 1817; Hook. f. & Thoms. in Hook. f., Fl. Brit. India 1: 7. 1872; Dunn in Gamble, Fl. Pres. Madras 3(3). 1915; E. Vajr., Fl. Palghat Dist. 44. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 13. 2004.

Malayalam Name : Vathamkodi, Vadakkodivalli

Distribution : South East Asia

Climbing shrubs. Leaves opposite, 2-3-foliolate; leaflets, elliptic-ovate, pubescent beneath. Inflorescence terminal and axillary divaricately branched panicles. Flowers greenish yellow, bisexual. Fruit achenes many; stalked, with spirally twisted, feathery persistent style.

Flowering & Fruiting : October-April

Notes : It is a Medicinal plant. Paste of young leaves applied on forehead for relief from cold and headache. Stem used as tooth stick to cure tooth-ache.

XCV. RHAMNACEAE

425.*Ziziphus oenopolia* (L.) Mill., Gard. Dict. (ed. 8). 3.1768; Lawson in Hook. f., Fl. Brit. India 1: 634.1875; Gamble, Fl. Pres. Madras 220(158).1918; E. Vajr., Fl. Palghat Dist. 121. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 101. 2004.*Rhamnus oenopolia* L., Sp. Pl. 194. 1753.

Malayalam Name : Cheruthudali, Kothavalli, Thodalli

Distribution : China, Tropical Asia and Australia. Throughout the hotter parts of India

Scandent shrubs, thorns many, recurved. Leaves simple, Alternate, ovate. Flowers shortly pedicelled,greenish yellow in colour. Drupe globose, black.

Flowering & Fruiting : November-March

Notes: It is a Medicinal plant. Ripe fruits eaten The plant usually shows malformations with profuse crowded slender shoots with small, pale, curled leaves. Probably this is due to some viral infection.

Herbarium: Coll.No.80.PLK/PTB/PKD/PTB/PKD, 21.12.2020, Praveenkumar K.(Fl).

426.*Ziziphus rugosa* Lam., Encycl. 3: 319. 1789; Lawson in Hook. f., Fl. Brit. India 1: 636. 1875; Gamble, Fl. Pres. Madras 221(158). 1918; E. Vajr., Fl. Palghat Dist. 121. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 101. 2004.

Distribution : South and South East Asia and China

Malayalam Name : Juli, Kottamullu, Malamthudali, Thodali

Scandent shrubs, thorns, recurved. Leaves simple, Alternate, ovate-orbicular. Flowers; subsessile. Calyx pubescent outside; lobes ovate acute, the keel on the inner face reduced to a line. Petals 0. Disk 5-lobed. Drupe globose, white or pink, glabrous; stone thin, 1-celled, 1-seeded.

Flowering & Fruiting : November-May

Notes: Ethnobot : Ripe fruits eaten.

XCVI. RHIZOPHORACEAE

427.*Carallia brachiata* (Lour.) Merr., Philipp. J. Sci. 15: 249. 1919; Vajr., Fl. Palghat Dist. 194. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 170. 2004.*Carallia integerrima* DC., Prodr. 3: 33. 1828; G. Hensl. in Hook. f., Fl. Brit. India 2: 439. 1878; Gamble, Fl. Pres. Madras 459(325). 1919.

Malayalam Name : Vallabham, Vankana, Varanga, Varrungu

Distribution : Indo-Malesia to Australia and China

Evergreen trees. Leaves simple, opposite, obovate, or obovate-oblong. Flowers bisexual, cream coloured, sessile, small, in short, trichotomous axillary branching cymes. Fruit a drupe, red, filiform; seed one, bright orange, subreniform.

Flowering & Fruiting : October-April

Notes : The wood is used for construction work and for furniture and other interior furnishing.

XCVII. RUBIACEAE

428.*Adina cordifolia* (Roxb.) Hook. f. ex Brand., For. Fl. 263. t.33. 1874; Hook. f., Fl. Brit. India 3: 24. 1880; Gamble, Fl. Pres. Madras 584(412). 1921. *Nauclea cordifolia* Roxb., Pl. Corom. t. 53. 1796. *Haldina cordifolia* (Roxb.) Ridsd., Blumea 24: 361. 1978; E. Vajr., Fl. Palghat Dist. 231. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 212. 2004.

Malayalam Name : Barakuram, Manjakadambu, Malamkadambu

Distribution : India, Myanmar, Sri Lanka and Indo-China

Deciduous trees. Leaves simple, opposite, decussate, orbicular or ovate or broadly ovate. Flowers bisexual, yellow, in axillary globose heads mixed with many filiform bracteoles. Hypanthium densely hairy. Fruit a capsule, of 2 dehiscent cocci, turbinate, brown; seeds many with tail at one end and a bifid wing other end.

Flowering & Fruiting : October-March

Notes : It is a Medicinal plant. Timber used for furniture, turnery works, etc.

429.*Anthocephalus cadamba* (Roxb.) Miq., Fl. Ind. Bat. 2: 135. 1850; Hook. f., Fl. Brit. India 3: 23. 1880. *Anthocephalus indicus* A. Rich., Mem. Rubiac. 157. 1830; Gamble, Fl. Pres. Madras 583(411). 1921.*Neolamarckia cadamba* (Roxb.) Bosser, Adansonia ser. 4. 6: 247. 1984; Sasidh., Fl. Parambikulam WLS 156. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 225. 2004.

Malayalam Name : Aattuthekku, Kadaarvayura, Kadambari, Kadambu

Distribution : Tropical Asia and China

Deciduous trees, bark pale brown. Leaves simple, opposite, decussate, ovate or elliptic-oblong. Flowers bisexual, yellowish, in globose heads. Fruit a capsule on a fleshy globose receptacle, orange yellow, capsule membranous; seeds may, angular, minute.

Flowering & Fruiting : April-August

Notes : It is a Medicinal plant

430.*Benkara malabarica* (Lam.) Tirveng., Taxon 32: 440. 1983; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 210. 2004.*Randia malabarica* Lam., Encycl. 3: 25.1789; Hook. f., Fl. Brit. India 3: 111. 1880; Gamble, Fl. Pres. Madras 616(435). 1921.*Griffithia fragrans* (Roxb.) Wight & Arn., Prodr. 400. 1834.*Gardenia fragrans* Roxb., Pl. Corom. 2: 19. t.137. 1800.*Xeromphis malabarica* (Lam.) Raju, Excurs. Himachala. Hills 13. 1966.*Catunaregam malabaricum* (Lam.) Sivar. in Manilal & Sivar., Manilal & Sivar., Fl. Calicut 131. 1982. 1982.

Malayalam Name : Cholakara

Distribution : Peninsular India and Sri Lanka

Armed large shrubs. Leaves elliptic, oblanceolate or obovate. Flowers in axillary corymbose cymes. Calyx tubular; teeth 5, triangular-acute. Corolla white, salver-shaped; lobes 5, oblong, acute, reflexed. Stamens 5, between the lobes, exserted; anthers linear. Berry subglobose, orange-red; seeds many, not embedded in pulp.

Flowering & Fruiting : January-May.

431.*Canthium angustifolium* Roxb., Fl. Ind. 2: 169. 1824; Hook. f., Fl. Brit. India 3: 135. 1880; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 210. 2004.*Plealtonia rheedei* (DC.) Bedd. var. angustifolia (Roxb.) Gamble, Fl. Pres. Madras 625(441).1921.*Canthium leschenaultii* (DC.) Wight & Arn. in Wight, Cat. 77. 1833 & Prodr. 426. 1834.*Dondisia leschenaultii* DC., Prodr. 4: 469. 1830.

Malayalam Name : Kattakara, Kattaramullu, Koyikkodavam

Distribution : India to Thailand

Erect shrubs with slender branches. Leaves lanceolate, long acuminate; domatia glandular. Cymes short, sessile. Flowers shortly pedicelled. Corolla tube globose. Drupe globose, compressed, obcordiform, bluish black; seeds 2.

Flowering & Fruiting : March-May.

432.*Canthium coromandelicum* (Burm. f.) Alston in Trimen, Handb. Fl. Ceylon (Suppl.) 6: 152. 1903; Sasidh., Fl. Parambikulam WLS 146. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 210. 2004.*Gmelina coromandelica* Burm. f., Fl. Ind. 132. 1768.*Canthium parviflorum* Lam., Encycl. 1: 602. 1788; Hook. f., Fl. Brit. India 3: 136. 1880.*Plealtonia parviflora* (Lam.) Bedd., For. Man. Bot. 134/5. 1872; Gamble, Fl. Pres. Madras 625(441). 1921.

Malayalam Name : Kandakara, Karamullu, Kattaramullu, Madhakara

Distribution : Indian Subcontinent

Armed shrubs. Leaves simple, opposite, ovate, elliptic-ovate to obovate. Flowers greenish, 4-merous, in axillary, sessile cymes below spines. Fruit subglobose, yellow; seed 1 or 2.

Flowering & Fruiting : April-June.

433.*Canthium rheedei* DC., Prodr. 4: 474. 1830, 'rheedii'; Hook. f., Fl. Brit. India 3: 134. 1880; E. Vajr., Fl. Palghat Dist. 229. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 210. 2004.*Plealtonia rheedei* (DC.) Bedd., For. Man. Bot. 134/5. 1872; Gamble, Fl. Pres. Madras 625(441). 1921.

Malayalam Name : Edalimullu

Distribution : Peninsular India and Sri Lanka

Armed shrubs. Leaves opposite, ovate, elliptic-ovate or lanceolate. Flowers in few-flowered, axillary fascicles. Corolla white; tube slightly constricted above, furnished with a curtain of stiff reflexed hairs within. Drupe obcordate, compressed; pyrenes rugose.

Flowering & Fruiting : March-June

Notes : It is a Medicinal plant.

434.*Catunaregam spinosa* (Thunb.) Tirveng., Adansonia 35: 13. 1978; E. Vajr., Fl. Palghat Dist. 230. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 210. 2004. *Gardenia spinosa* Thunb., Diss. Gard. 7: 16. t.2. f.4. 1780.*Gardenia dumetorum* Retz., Obs. Bot. 2: 14. 1781.*Randia dumetorum* (Retz.) Poir. var. floribunda (DC.) Gamble, Fl. Pres. Madras 616(434). 1921.*Randia brandisii* Gamble, Fl. Pres. Madras 616(434).

1921, nom. illeg.*Randia spinosa* (Thunb.) Poir. in Lam., Encycl. Suppl. 2: 329.1811; Hook. f., Fl. Brit. India 3: 110.1880.*Randia tomentosa* Wight & Arn., Prodr. 398. 1834 non Blume; Matthew & Rani in Matthew, Fl.Tam.Carnatic 3 (2): 738.1983.

Malayalam Name : Kara, Karachulli, Krimbulli.

Distribution : South Asia to S. China and W. Malesia

Large shrub to small trees. Leaves opposite on short lateral branchlets, obovate, obtuse, tomentose below. Flowers solitary, terminal on lateral branches, pedicellate. Corolla tube broad, densely villous at the base inside; lobes 5, obovate, twisted, white. Fruit an obovoid berry, glabrous; seeds many, embedded in pulp.

Flowering & Fruiting : April-December

Notes : It is a Medicinal plant.

435.*Chassalia curviflora* (Wall. ex Kurz) Thwaites var. *longifolia* (Dalz.) Hook.f., Fl. Brit. India 3: 177. 1880; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 211. 2004.*Psychotria longifolia* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 133. 1851.

Distribution : Indo-Malesia

Erect shrubs. Leaves much longer, glabrous, linear-lanceolate. Inflorescence glabrous, peduncle fleshy, pink. Flowers pink. Calyx short, 5-lobed. Fruit globose, smooth, didymous.

Flowering & Fruiting : March-June.

Herbarium:Coll.No.100.MNK/CVA/OTP/PKD,17.02.2021,PraveenkumarK.(Fl)

436.*Coffea travancorensis* Wight & Arn., Prodr. 433. 1834; Hook. f., Fl. Brit. India 3: 154. 1880; Gamble, Fl. Pres. Madras 637(449). 1921.*Psilanthus travancorensis* (Wight & Arn.) Leroy, Compt. Rend. Hebd. Seances Acad. Sci. 29, D: 595. 1980; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 231. 2004.

Malayalam Name : Pushkkaramoolam, Pushkkaramulla

Distribution : Peninsular India and Sri Lanka

Shrubs . Leaves broadly ovate, elliptic or oblanceolate, shining green above, paler beneath, coriaceous. Inflorescence terminal or axillary, 1-5 flowered cymes. Flowers white, fragrant. Fruits depressed globose, didymous, blue-black when ripe; seeds ellipsoid, with a prominent ventral groove.

Flowering & Fruiting : October-December

Notes : It is a Medicinal plant.

437.*Gardenia jasminoides* Ellis, Phil. Trans. 51: 935. 1761; Gamble, Fl. Pres. Madras 619(437). 1921.*Gardenia florida* L., Sp. Pl. (ed.2) 305. 1762, nom. illeg.*Gardenia augusta* Merr., Interpr. Herb. Amboin.: 485. 1917. nom. superfl.

Malayalam Name : Gandharajan

Distribution : Native of East Asia

Bushy shrubs. Leaves opposite or ternately whorled, obovate or nearly lanceolate. Flowers solitary, often double, terminal at the forks of branches or becoming lateral by displacement on single shoot. Corolla white, turning to yellow, fragrant, tube stout, broader upward, lobes obovate or oblanceolate, very often double. Stamens 5, adnate to the tube. Berry orange, ellipsoid.

Flowering & Fruiting : August-May

Notes : It is an Exotic and a Garden plant.

438.*Geophila repens* (L.) Johnst., Sargentia 8: 281. 1949; E. Vajr., Fl. Palghat Dist. 231. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 212. 2004.*Rondeletia repens* L., Syst. Nat. (ed.10) 928. 1759.*Geophila reniformis* D. Don, Prodr. Fl. Nepal. 136. 1825; Hook. f., Fl. Brit. India 3: 178.1880; Gamble, Fl. Pres. Madras 643(454). 1921.*Geophila repens* var. *asiatica* (Cham. & Schlecht.), Fosb., Smiths. Contrib. Bot. 45: 27.1980. *Geophila herbacea* (Jacq.) K. Schum. in Engl. & Prantl, Naturl. Pflanzenfam. 4(4): 199. 1891.

Malayalam Name : Karimutthil, Karinkudungal

Distribution : Pantropical

Prostrate herbs. Leaves simple, orbicular or broadly ovate to reniform. Flowers solitary or in few-flowered umbels. Calyx tube short; lobes subulate, persistent. Corolla funnel-shaped, hairy within, white; lobes recurved, ovate-acute. Stamens 5, included. Ovary 2-locular; ovule 1-per locule. Berry globose, scarlet; seeds plano-convex.

Flowering & Fruiting : October-April

Notes : It is a Medicinal plant.

439.*Ixora brachiata* Roxb. ex DC., Prodr. 4: 488. 1830; Hook. f., Fl. Brit. India 3: 142. 1880; Gamble, Fl. Pres. Madras 631(445). 1921; E. Vajr., Fl. Palghat Dist. 233. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 218. 2004. (Plate 10 G).

Malayalam Name : Marachekki, Marachethi

Distribution : Western Ghats (Endemic)

Evergreen trees; branchlets terete, glabrous. Leaves simple, opposite, decussate. Flowers bisexual, white or pale pink, fragrant, small, sessile, in terminal. Calyx tube minute. Corolla, slender, oblong, recurved. Berry, red-purple, globose, glabrous; pyrenes planoconvex.

Flowering & Fruiting : January-May.

440.*Ixora coccinea* L., Sp. Pl. 110. 1753; Hook. f., Fl. Brit. India 3: 145. 1880; Gamble, Fl. Pres. Madras 631(445). 1921; E. Vajr., Fl. Palghat Dist. 233. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 218. 2004.*Ixora coccinea* var. *lutea* (Hutch.) Corner, Gard. Bull. Straits Settlem. 11: 186. 1941.*Ixora coccinea* var. *rosea* (Hutch.) Corner, Gard. Bull. Straits Settlem. 11: 186. 1941.

Malayalam Name : Chethi, Shekki, Kattuchethi, Thechi, Thetti

Distribution : India, Bangladesh, Sri Lanka, Myanmar, Thaliland, Vietnam

Bushy shrubs. Leaves simple, opposite, elliptic to oblong, greenish on drying. Corymbs; peduncle and pedicels short. Corolla scarlet red, orange, claret rose, yellow, yellowish-orange or lemon yellow; tube, puberulous without. Stamens

attached at throat; anthers. Ovary; style, exserted. Berry, didymous, purple; seeds 2, globose.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal, a Garden and an Edible plant. Flowers, leaves, roots, and stem are used to treat various ailments in the Indian traditional system of medicine, the Ayurveda, and also in folk medicines. Mature fruits are edible.

Herbarium:Coll.No.09.MNK/CVA/OTP/PKD,19.01.2020,Praveenkumar K.(Fl).

441.*Ixora javanica* (Blume) DC., Prodr. 4: 487. 1830; T. Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 90.1989; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 218. 2004.Pavetta javanica Blume, Bijdr. 949. 1826.*Ixora stricta* var. *javanica* (Blume) Kuntze, Revis. Gen. Pl. 1: 286. 1892.

Malayalam Name : Asoka-chethi, Asoka-thetti

Distribution : East Himalayas to South East Asia

Shrubs. Leaf opposite, oblong or elliptic-oblong, ,glabrous. Inflorescence wide, subsessile or peduncle. Flowers several per head, yellowish-orange or bright red, generally in trichasia, the central ones sessile and ebracteolate. Fruits, depressed, globose.

Flowering & Fruiting : November-July

Notes : It is an Exotic and a Garden plant.

Herbarium:Coll.No.191.ANK/TCK/MKD/PKD,22.02.2022,PraveenkumarK.(Fl)

442.*Ixora malabarica* (Dennst.) Mabb., Taxon 26: 539. 1977; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 219. 2004.*Chiococca malabarica* Dennst., Schluss. Hort. Malab. 12, 19 & 37. 1818.*Ixora lanceolaria* Colebr. in Roxb., Fl. Ind. 1: 397. 1820; Hook. f., Fl. Brit. India 3: 138. 1880; Gamble, Fl. Pres. Madras 630(444). 1921.*Ixora leucantha* Heyne ex G. Don, Gen. Hist. 3: 572. 1834; Gamble, Fl. Pres. Madras 630(444). 1921; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 219. 2004. (Plate 10 H).

Malayalam Name : Cherukuravu

Distribution : Southern Western Ghats (Endemic)

Slender erect shrubs. Leaves simple, opposite, thin-coriaceous. Cymes corymbiform, flaccid, few-flowered. Calyx campanulate; lobes. Corolla greenish-yellow; tube; lobes, lanceolate, curled and recurved. Stamens attached between corolla lobes at throat of tube. Berry, subglobose.

Flowering & Fruiting : October-March.

443.*Mitracarpus hirtus* (L.) DC., Prodr. 4: 572. 1830; E. Vajr., Fl. Palghat Dist. 236. 1990.*Spermacoce hirta* L., Sp. Pl. ed. 2: 148. 1762.*Mitracarpus villosus* (Sw.) DC., Prodr. 4: 572. 1830; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 222. 2004. *Spermacoce villosa* Sw., Prodr. 29. 1788.*Mitracarpus verticillatus* (Schum. & Thonn.) Vatke, Linnaea 40: 196. 1876.*Mitracarpus hirtus* (L.) DC. var. *sessilis* Dhruvan, Pandur. & Mohanan, Taprobanica 6(2): 77. 2014.

Malayalam Name : Thaval, Thaaval

Distribution : Tropical America; now common in South India

Erect pubescent herbs. Leaves simple, opposite, ovate or ovate-lanceolate. Flowers white, verticillate in axillary fascicles, 4-merous; bracteoles filiform. Calyx-tube small, unequally 4-lobed, larger 2 lobes. Corolla funnel-shaped; lobes 4. Stamens 4, attached at throat. Ovary 2-locular, ovule 1-per locule. Capsule ovoid, dehiscence circumcissile; seeds 2, minute.

Flowering & Fruiting : July-December

Notes : It is an Exotic and a Weed plant.

444.*Morinda pubescens* J.E. Smith in Rees, Cyclop. 24: 3. 1813; E. Vajr., Fl. Palghat Dist. 237. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 223. 2004.*Morinda tinctoria* Roxb., Fl. Ind. 2: 197. 1824; Hook. f., Fl. Brit. India 3: 156. 1880; Gamble, Fl. Pres. Madras 651(459). 1921.*Morinda coreia* Buch.-Ham., Trans. Linn. Soc. London 13: 537. 1822. (Plate 3 F).

Malayalam Name : Manjanathi, Manjapavitta, Pavitta, Kattapitalavam

Distribution : Indo-Malesia

Deciduous trees. Leaves simple, opposite, decussate; elliptic-lanceolate, oblanceolate or elliptic-oblong. Flowers bisexual, white, in terminal, globose

heads. Calyx limb truncate. Corolla tube villous within; lobes 4, oblong, recurved. Stamens 4, attached to the throat of corolla; anthers exserted. Ovary 1.5 mm, 2-celled or incompletely 4-celled; stigma 2 lobed. Fruit a syncarp, globose, pyrenes 4, oblong; seeds not winged.

Flowering & Fruiting : March-June

Notes : It is a Medicinal plant.

Herbarium:Coll.No.38.KPS/ANR/MKD/PKD,21.03.2020, Praveenkumar K.(Fl).

445.*Mussaenda frondosa* L., Syst. Nat. (ed.10) 2: 931.1759; Hook. f., Fl. Brit. India 3: 89. 1880; Gamble, Fl. Pres. Madras 610(430). 1921; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 223. 2004;E. Vajr., Fl. Palghat Dist. 237. 1990; Sasidh., Fl. Parambikulam WLS 155. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 223. 2004.*Mussaenda laxa* (Hook. f.) Hutch. ex Gamble, Fl. Pres. Madras 610(430). 1921.*Mussaenda frondosa* L. var. laxa Hook. f., Fl. Brit. India 3: 89. 1880. (Plate 11 F).

Malayalam Name : Parathole, Vellila, Vellilam, Vellilathaali.

Distribution : South Asia (Endemic)

Straggling shrubs; branchlets pubescent. Leaves simple, opposite, broadly ovate. Cymes terminal, lax, tomentose. Flowers 5-merous; bracts and bracteoles linear, hairy. Corolla 2. funnel-shaped dilated above middle, orange-red or yellow, tomentose outside, villous at mouth; lobes ovate-lanceolate. Stamens 5, included or exserted. Berry, globose.

Flowering & Fruiting : September-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.116.VGK/VZY/OTP/PKD,16.03.2021,Praveenkumar K.(Fl).

446.*Mussaenda glabrata* (Hook. f.) Hutch. ex Gamble, Fl. Pres. Madras 610(430). 1921; R. Ansari, Fl. Kasaragod Div. 198. 1985; E. Vajr., Fl. Palghat Dist. 238. 1990 Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 223. 2004.*Mussaenda frondosa* L. var. *glabrata* Hook. f., Fl. Brit. India 3: 90. 1880. (Plate 11 G).

Malayalam Name : Vellila, Vattuthali

Distribution : Western Ghats (Endemic)

Erect or climbing shrubs. Leaves opposite, elliptic-oblong . Flowers, tubular-funnel-shaped, yellowish green outside and orange-red within, one calyx lobe occasionally becoming white and foliaceous, borne in terminal cymes. Berry rounded or ovoid, glabrous.

Flowering & Fruiting : July-November

Notes : It is a Medicinal plant.

447.*Neolamarckia cadamba* (Roxb.) Bosser, Adansonia ser. 4. 6: 247. 1984; Sasidh., Fl. Parambikulam WLS 156. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 225. 2004. *Nauclea cadamba* Roxb., Fl. Ind. 2: 121. 1824.*Anthocephalus chinensis* sensu A. Rich. ex Walp., Rep. 2: 491. 1843, non *Cephalanthus chinensis* Lam. 1785.*Anthocephalus cadamba* (Roxb.) Miq., Fl. Ind. Bat. 2: 135. 1850; Hook. f., Fl. Brit. India 3: 23. 1880.*Anthocephalus indicus* A. Rich., Mem. Rubiac. 157. 1830; Gamble, Fl. Pres. Madras 583(411). 1921.

Malayalam Name : Aattuthekku, Kadambu, Kadhamba-vriksham

Distribution : Tropical Asia and China

Deciduous trees. Leaves simple, opposite, decussate, ovate or elliptic-oblong. Flowers bisexual, yellowish, in globose heads. Fruit a capsule on a fleshy globose receptacle, orange yellow, capsule membranous; seeds may, angular, minute.

Flowering & Fruiting : April-August

Notes : It is a Medicinal plant.

448.*Oldenlandia corymbosa* L., Sp. Pl. 119.1753, var. corymbosa; Hook. f., Fl. Brit. India 3: 64. 1880,p.p.; Gamble, Fl. Pres. Madras 600(423). 1921; Vajr., Fl. Palghat Dist. 239. 1990.*Hedyotis corymbosa* (L.) Lam., Encycl. 1: 272. 1792; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 215. 2004.

Malayalam Name : Parpadakapullu

Distribution : Paleotropics

Diffuse or spreading prostrate herbs. Leaves simple, opposite, linear-lanceolate. Flowers 2-6 in a corymb; 4-merous. Calyx tube lobes minute. Corolla white. Capsules subglobose, loculicidal, dehiscing at top only; seeds minute, trigonous.

Flowering & Fruiting : April-September

Notes : It is a Medicinal plant.

449.*Pavetta indica* L., Sp. Pl. 110. 1753; Hook. f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Pres. Madras 633(446). 1921; E. Vajr., Fl. Palghat Dist. 242. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 229. 2004.

Malayalam Name : Kamatta, Pavetta

Distribution : India and Sri Lanka

Shrubs or small trees. Leaves opposite, oblanceolate, chartaceous. Corymbs terminal, sessile or peduncled, glabrous. Flowers 50-200 per cyme. Corolla white. Berry globose.

Flowering & Fruiting : April-July

Notes : It is a Medicinal plant.

Herbarium:Coll.No.16.VGK/VZY/OTP/PKD, 06.02.2020, Praveenkumar K.(Fl).

450.*Pavetta tomentosa* Roxb. ex J.E. Smith in Rees, Cyclop. 26: 52.1813; Gamble, Fl. Pres. Madras 1879(1301). 1936; E. Vajr., Fl. Palghat Dist. 242. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 229. 2004.*Pavetta indica* L. var. *tomentosa* (Roxb. ex J.E. Smith) Hook. f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Pres. Madras 633(446). 1921.

Distribution : India and Indo-China

Shrubs to small trees, stem terete or quadrangular. Leaves opposite, broadly elliptic to elliptic-lancelolate. Inflorescence terminal, subsessile, trichotomously branched, corymbose cymes. Flowers white. Drupes didymous, shining, pubescent with a crown of calyx teeth; seeds 1 or 2.

Flowering & Fruiting : May-June.

451.*Scleromitrion diffusum* (Willd.) R.J. Wang, J. Trop. Subtrop. Bot. 22: 440 .2014.*Oldenlandia diffusa* (Willd.) Roxb., Hort. Bengal.: 11 .1814. Hook. f., Fl. Brit. India 3: 65. 1880; Gamble, Fl. Pres. Madras 601(423). 1921.*Hedyotis diffusa* Willd., Sp. Pl. 1: 566. 1768; Manilal, Fl. Silent Valley 132. 1988. *Oldenlandia brachypoda* G. Don, Gen. Hist. 3: 529. 1834. nom. illeg; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 226. 2004.

Malayalam Name : Parpadakam, Parpadakapullu

Distribution : Tropical and Subtropical Asia and America

Small diffuse herbs. Leaves narrow, linear; stipules sheathing, shortly pectinate on the margins. Flowers axillary, solitary or binate, sessile to shortly pedicelled. Calyx tube subglobose; lobes triangular. Corolla white. Style shortly exserted; stigma papillate. Capsule ovoid, laterally compressed, dehiscing loculicidally at tip; seeds minute, angular, reticulate.

Flowering & Fruiting **:** August-November.

452.*Spermacoce articularis* L. f., Suppl. Pl. 119. 1781; Sasidh., Fl. Parambikulam WLS 162. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 234. 2004.*Borreria articularis* (L. f.) F.N. Will., Bull. Herb. Borss. 2. ser.5: 956. 1905.

Malayalam Name : Kudalchurukki, Natthachuri, Tharthavel

Distribution : Tropical Asia and Africa

Diffuse herbs; adpressed minutely hairy. Leaves elliptic or obovate. Flowers in axillary, few-flowered sessile clusters. Calyx-tube obovoid; lobes 2, with 2 intermediate teeth, hairy. Corolla pinkish-white. Capsule globose, hispid, 2-valved, splitting septicidally into two mericarps then septum detaches from the valves, releasing the seeds; seeds oblong, brown, reticulate.

Flowering & Fruiting : October-December.

Herbarium: Coll.No.40.EPN/KVR/CTR/PKD, 05.04.2020, Praveenkumar K.(Fl).

453.*Spermacoce hispida* L., Sp. Pl. 102. Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 235. 2004. *Borreria hispida* (L.) K. Schum. in Engl. & Prantl, Naturl. Pflanzenfam. 4: 144. 1891, non Spruce ex K. Schum. 1888; Gamble, Fl. Pres. Madras 654(461).

1921.*Borreria articularis* (L. f.) F.N. Will. var. hispida (L.) Sivar. & Manilal, New Botanist 2: 88. 1975.

Malayalam Name : Tharthavel, Natthachoori,Kudalchurukki.

Distribution : Tropical & Subtropical Asia

A procumbent herb; stem bluish, hispid. Leaves opposite, oblong-elliptic to obovate, hispid on both sides. Flowers in axillary verticillate cymes. Calyx tube ovoid, hispid without; lobes 4, obovate. Corolla pinkish-white; tube slender, hairy at throat; lobes 4. Capsule subglobose, hispid without; seeds 2, oblong or ovoid, ventrally grooved, granulate, brown; septum detaching from coccus.

Flowering & Fruiting : May-August.

454.*Spermacoce latifolia* Aubl., Hist. Pl. Guinea Fr. 1: 55. t.19/1. 1775; Manilal, Fl. Silent Valley 143. 1988; Sasidh., Fl. Parambikulam WLS 162. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 235. 2004.*Borreria latifolia* (Aubl.) K. Schum. in Mart., Fl. Bras. 4: 61. 1888.*Borreria eradii* Ravi, J. Bombay Nat. Hist. Soc. 6: 539. 1970.

Malayalam Name : Pachhapalla, Vellatharavu, Tharavu

Distribution : Native of Tropical America; now established in Tropical Africa & Asia

Diffuse herbs; hispid. Leaves broadly elliptic or ovate, loosely hispid on both sides. Flowers in axillary few-flowered cymes. Calyx lobes ovate-acuminate, unequal. Corolla white or pale pink, hairy at throat; lobes 4. Stamens attached at throat between the lobes. Capsule 2. ellipsoid, densely pubescent; seeds 2, ellipsoid, reticulate-rugose on dorsal side.

Flowering & Fruiting : August-October

Notes : It is an Exotic and a Weed plant.

Herbarium:Coll.No.204.TTN/KVR/CTR/PKD,20.04.2022,Praveenkumar K.(Fl).

455.*Spermacoce ocymoides* Burm. f., Fl. Ind. 34 & 13. f.1. 1768; Hook. f., Fl. Brit. India 3: 200. 1881; Deb & Dutta, J. Econ. Tax. Bot. 5: 1052. 1984; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 235. 2004.*Borreria ocymoides* (Burm. f.) DC., Prodr. 4: 544.

1830; Gamble, Fl. Pres. Madras 654(461). 1921; E. Vajr., Fl. Palghat Dist. 228. 1990.*Borreria ocymoides* (Burm. f.) DC. var. *thekkumalensis* Sivar. & Joseph, New Botanist 6: 133. 1979.

Malayalam Name : Tharakeera

Distribution : Indo-Malesia and Tropical Africa

Pubescent, erect herbs. Leaves simple, decussate, sparsely scabrous, elliptic-oblong, (sub)sessile; stipules; nerves 3 or 4 pairs. Flowers 40-50 per node. Calyx truncate, strigose without; lobes 4, unequal, linear-lanceolate, 2 short and 2 long. Corolla white; glabrous within; lobes 4. Stamens 4. Capsule truncate, dehiscing transversely.

Flowering & Fruiting : November-December.

Herbarium:Coll.No.149.MNK/CVA/OTP/PKD,30.07.2021,PraveenkumarK.(Fl)

XCVIII. RUTACEAE

456.*Aegle marmelos* (L.) Correa, Trans. Linn. Soc. London 5: 223. 1800; Hook. f., Fl. Brit. India 1: 516. 1875; Gamble, Fl. Pres. Madras 161(115). 1915; E. Vajr., Fl. Palghat Dist. 102. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 78. 2004. (Plate 6 A).

Malayalam Name : Koolakam, Koovalam, Vilvam, Mavilavu

Distribution : India and Sri Lanka; widely cultivated in South East Asia, Malesia, Tropical Africa and the United States

Deciduous tall trees. Leaves Alternate, three foliolate. Inflorescences axillary and terminal, racemose or corymbose. Flowers bisexual, fragrant. Petals five, white above and greenish below, ovate-oblong. Berries ovoid, woody, yellowish, many seeded; seeds oblong and flat, embedded in the pulp.

Flowering & Fruiting : March-May

Notes : It is a Medicinal plant. Dry leaves powdered and mixed with the leaf powder of neem and tulasi is given 3times a day for 15 days. The leaves and fruit have shown to posses antidiabetic activity in albinorats.

457.*Citrus limon* (L.) Burm. f., Fl. Ind. 173. 1768; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 79. 2004. *Citrus medica* L. var. *limon* L., Sp. Pl. 782. 1753.*Citrus limonum* Risso, Ann. Mus. Natl. Hist. Nat. Paris 20: 201. 1813.*Citrus aurantium* L. var. limonum Wight & Arn., Prodr. 98. 1834.*Citrus medica* L. var. *limonum* (Risso) Hook. f., Fl. Brit. India 1: 515. 1875.

Malayalam Name : Cherunaregam.

Distribution : Native of South East Asia; cultivated in tropical & subtropical countries

Small armed trees. Leaves Alternate; leaflets ovate-lanceolate, apex obtuse, coriaceous. Flowers axillary, in clusters, cymes or solitary, white.. Berry globose, fleshy, rind leathery.

Flowering & Fruiting : February-May

Notes : It is a Medicinal, an Exotic and an Edible plant.

458.*Citrus medica* L., Sp. Pl. 1782. 1753; Hook. f., Fl. Brit. India 1: 515. 1875; Gamble, Fl. Pres. Madras 161(115). 1915; E. Vajr., Fl. Palghat Dist. 107. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 80. 2004.*Citrus aurantium* L. var. *medica* (L.) Wight & Arn., Prodr. 98. 1834**.**

Malayalam Name : Ganapathi-naragam, Madulungam.

Distribution : India and Myanmar

Shrubs or small trees. Leaves Alternate, 1-foliolate; leaflets variable, glabrous. Inflorescences axillary racemes, few-flowered. Flowers bisexual and male. Petals 4, oblong, purplish. Fruits ellipsoid-oblong, or obovoid, yellowish, surface rough or warty on outer. seeds numerous, acute at base, smooth, white.

Flowering & Fruiting : March-October

Notes : It is a Medicinal, an Exotic and an Edible plant.

459.*Glycosmis pentaphylla* (Retz.) DC., Prodr. 1: 538. 1824, quoad basionym; Hook. f., Fl. Brit. India 1: 499.1875; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 81. 2004.*Limonia pentaphylla* Retz., Obs. Bot. 5: 24. 1788.Limonia arborea Roxb., Pl.

Corom.t.85. 1798.*Glycosmis arborea* (Roxb.)DC., Prodr. 1: 538.1824; E. Vajr., Fl. Palghat Dist. 104. 1990.*Glycosmis cochinchinensis* Gamble, Fl. Pres. Madras 153(109). 1915p.p, non (Lour.) Pierre ex Engl. 1896.

Malayalam Name : Kuttippannel, Kurumpannal, Panal, Panchi

Distribution : Indo-Malesia

Erect shrubs. Leaves Alternate, leaflets subopposite, elliptic-lanceolate, glabrous. Flowers in terminal or axillary, spiciform panicles. Petals white, obovate, surface gland-dotted. Disk prominent, annular. Ovary ovoid, 5-celled; stigma flat or obscurely lobed. Berry ovoid, white turning pink, 1-2-seeded.

Flowering & Fruiting : September-April

Notes : It is a Medicinal plant. The decoction prepared out of crushed fruits and cumin seeds in the treatment of dysentery Young stem are used as tooth brush and useful for diarrhea Leaf oil is given for diabetes. It showed hypoglycemic activity.

Herbarium:Coll.No.122.VTK/PKY/ALT/PKD,01.04.2021, Praveenkumar K.(Fl).

460.*Murraya koenigii* (L.) Spreng., Syst. Veg. 2: 315. 1825; Hook. f., Fl. Brit. India 1: 503. 1875; Gamble, Fl. Pres. Madras 156(111). 1915; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 82. 2004.*Bergera koenigii* L., Mant. Pl. 2: 563. 1771.*Chalcas koenigii* (L.) Kurz, J. Asiat. Soc. Bengal, Pl. 2, Nat. Hist. 44: 132. 1875.

Malayalam Name : Kariveppila, Karivepu, Karuveppu, Veppila

Distribution : Indo-Malesia and China

Shrubs or small trees. Leaves pinnate, crowded at twig-ends. Panicles terminal, corymbose, many-flowered. Flowers small, white; Sepals. Petals white, linear. Berry subglobose, purplish-black when ripe; seeds 1or 2, green, globular-ovoid.

Flowering & Fruiting : March-July

Notes : It is a Medicinal plant.

Herbarium:Coll.No.226.AKK/VZY/OTP/PKD,17.03.2023,Praveenkumar K.(Fl).

461.*Murraya paniculata* (L.) Jack., Malay. Misc. 1: 31. 1820; E. Vajr., Fl. Palghat Dist. 105. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 82. 2004.*Chalcas paniculata* L., Mant. Pl. 1: 68. 1767.*Murraya exotica* L., Mant. Pl. 2: 563. 1771; Hook. f., Fl. Brit. India 1: 502. 1875; Gamble, Fl. Pres. Madras 155(111). 1915.

Malayalam Name : Kattumulla, Maramulla, Naaragamulla.

Distribution : Indo-Malesia and Australia

Shrubs or small trees. Leaves 3-7-foliolate; leaflets ovate to elliptic-ovate or rhomboid, glabrous. Panicles few-flowered, from the axils of upper leaves. Calyx lobes 5, ovate. Petals 5, elliptic to ovate-elliptic, white. Stamens 10; disc annular. Ovary, oblong, 2-celled; ovules 1 in each cell; stigma capitate., ellipsoid, acute, red.

Flowering & Fruiting : March-September

Notes : It is a Medicinal and a Garden plant. Hot water extract of leaves used for toothache.

462.*Naringi crenulata* (Roxb.) Nicolson in Saldanha & Nicolson, Fl Hassan Dist. 387. 1976; E. Vajr., Fl. Palghat Dist. 106. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 82. 2004.*Limonia crenulata* Roxb., Pl. Corom. t. 86. 1798; Gamble, Fl. Pres. Madras 157(112). 1915.*Hesperethusa crenulata* (Roxb.) Roem., Syn. Monogr. 1: 38. 1846.*Limonia acidissima* sensu Hook.f., Fl. Brit. India 1: 507. 1875, non L. 1762.

Distribution : India to Indo-China

Malayalam Name : Dadhiphala, Kattunarakam, Mahavilvam.

Trees. Leaves imparipinnate, Alternate; leaflets opposite, sessile, elliptic or elliptic-obovateglabrous. Flowers bisexual, white, in few flowered axillary racemes. Fruit a berry, subglobose, bluish-black, glandular; seeds 1-4, dull yellow, smooth.

Flowering & Fruiting : June-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.102.ANK/TCK/MKD/PKD,18.02.2021,PraveenkumarK.(Fl)

463.*Zanthoxylum rhetsa* (Roxb.) DC., Prodr. 1: 728. 1824; Hook. f., Fl. Brit. India 1: 495. 1875; Gamble, Fl. Pres. Madras 150(107). 1925; Sasidh., Fl. Parambikulam WLS 52. 2002; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 84. 2004.*Fagara rhetsa* Roxb., Fl. Ind. 1: 438. 1820.*Zanthoxylum limonella* (Dennst.) Alston in Trimen, Handb. Fl. Ceyl. 6: 37. 1931.*Fagara budrunga* Roxb., Fl. Ind. 1: 437.1820.*Zanthoxylum budrunga* (Roxb.) DC., Prodr. 1: 728.1824; Hook. f., Fl. Brit. India 495.1875; Gamble, Fl. Pres. Madras 150(107). 1915.

Malayalam Name : Kothumurikku, Kuyilmaram, Mullilam

Distribution : Indo-Malesia to Australia

Deciduous treesarmed with conical prickles. Leaves imparipinnate, Alternate, clustered at the tips of branchlets. Flowers polygamous, greenish-yellow, in terminal cymose panicles. Fruit a capsule, of 1-4 cocci, purplish, tubercled, aromatic; seeds globose, smooth, blue-black.

Flowering & Fruiting : March-November

Notes : It is a Medicinal plant.

XCIX. SANTALACEAE

464.*Santalum album* L., Sp. Pl. 349. 1753; Hook. f., Fl. Brit. India 5: 231. 1886; Gamble, Fl. Pres. Madras 1261(883). 1925; E. Vajr., Fl. Palghat Dist. 414. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 406. 2004. (Plate 8 C).

Malayalam Name : Chandanam

Distribution : Peninsular India and Malesia to Australia

Evergreen trees. Leaves simple, opposite, elliptic. Flowers bisexual, reddish-purple, in axillary and terminal paniculate cymes. Fruit a drupe, globose, blackish-purple, annulate above, beaked with the basal part of the style; seed one.

Flowering & Fruiting : November-December

Notes: It is a Medicinal plant, Wood is ground into a paste and applied on the forehead for headache.

Herbarium:Coll.No.157.PBK/KVS/ALT/PKD,12.12.2021, Praveenkumar K.(Fl).

C. SAPINDACEAE

465.*Allophylus serratus* (Roxb.) Kurz, J. Asiat. Soc. Bengal 44: 185. 1876; Gamble, Fl. Pres. Madras 246(175). 1918; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 107. 2004.*Allophylus cobbe forma serratus* (Roxb.) Hiern in Hook. f., Fl. Brit. India 1: 673. 1875.

Malayalam Name : Mukkannanpezhu, Mukkannaperuku.

Distribution : India, Sri Lanka and Indo-China

Shrubs; branchlets lenticellate. Leaves trifoliate, leaflets ovate, acuminate at apex, attenuate at base. Flowers 3-5-together; pedicel jointed; sepals orbicular; petals spathulate; lobes of disc orbicular. Drupe puberulous.

Flowering & Fruiting : July-October

Notes : It is a Medicinal plant.

Herbarium: Coll.No.56. KVP/KDI/PLK, 17.06.2020, Praveenkumar K.(Fl).

466.*Cardiospermum halicacabum* L., Sp. Pl. 366. 1753; Hook. f., Fl. Brit. India 1: 670. 1875; Gamble, Fl. Pres. Madras 244(175). 1918; E. Vajr., Fl. Palghat Dist. 130. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 107. 2004.

Malayalam Name : Ulincha, Uzhinja, Valliuzhinja

Distribution : Tropical & Subtropical regions

Climbing or trailing herbs. Leaves Alternate, bi-ternate; leaflets ovate-lanceolate, deeply dentate or lobed. Flowers white polygamous in 3-7-flowered axillary tendril-bearing peduncles. Capsule 3-valved, covered with bladder-like calyx, winged at the angles, papery; seeds one in each chamber, black with a white eye.

Flowering & Fruiting : July-February

Notes : It is a Medicinal plant.

Herbarium:Coll.No.151.KMN/ECY/CTR/PKD,29.08.2021,PraveenkumarK.(Fl).

467.*Sapindus trifoliatus* L., Sp. Pl. 367. 1753; Hook. f., Fl. Brit. India 1: 682. 1875; Sasidh., Fl. Parambikulam WLS 75. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 109. 2004.

Malayalam Name : Aritha, Chavakai, Pasaka, Pasakotta, Ponnankotta,

Distribution : South Asia

Trees, bark greyish-brown. Leaves paripinnate, Alternate. Flowers polygamous, greenish-white, in axillary or terminal panicles; panicles densely pubescent. Fruit a drupe, globose, greenish-yellow, fulvous hairy when young, wrinkled when ripe; seeds 2-3, globose, black.

Flowering & Fruiting : December-April

Notes **:** It is a Medicinal plant.

468.*Schleichera oleosa* (Lour.) Oken, Allg. Naturgesch. 3: 1341. 1841; E. Vajr., Fl. Palghat Dist. 133. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 109. 2004.*Pistacia oleosa Lour.*, Fl. Cochinch. 615. 1790.*Schleichera trijuga* Willd., Sp. Pl. 4: 1096. 1805; Hook. f., Fl. Brit. India 1: 681. 1875; Gamble, Fl. Pres. Madras 248(177). 1915.

Malayalam Name : Doodalam, Poovanam, Poovam, Puvam, Puvathi

Distribution : Indo-Malesia

Deciduous trees. Leaves paripinnate, Alternate; leaflets opposite or subopposite, elliptic-oblong. Flowers polygamodioecious, greenish-yellow, in axillary spicate panicles. Fruit a drupe, subcrustaceous, pointed, often echinate with stout rather blunt prickles; seed 1 or 2, enclosed in a pulpy aril which has a pleasant acid taste; testa smooth, brown.

Flowering & Fruiting : March-June

Notes : It is a Medicinal plant. Aril and kernel of fruits eaten.

Herbarium: Coll.No.117.TVK/PTK/ALT/PKD,17.03.2021,Praveenkumar K.(Fl).

CI. SAPOTACEAE

469.*Chrysophyllum cainito* L., Sp. Pl. 192.1753; Vink, Blumea 9: 26. 1958; Pennington, Gen. Sapotaceae 224. 1991. (Plate 14 F).

Distribution : Native of Central America and Carribean, widely cultivated throughout the tropics

Trees. Leaves simple, Alternate, distichous, ovate to elliptic-oblong. Flowers in axillary fascicles of 5-30; pedicel silky. Corolla white, 5-lobed, lobes ovate, margins glabrous. Stamens 5; filaments deltoid, anthers ovoid. Ovary ferruginous-villous, 7-10-locular; style glabrous, stigma 7-10-lobed. Fruit globose, purplish-brown, glabrous; seeds 3-10, obovoid, laterally compressed.

Flowering & Fruiting : June-February

Notes : It is an Exotic, a Garden and an Edible plant.

Herbarium:Coll.No.34. EPN/KVR/CTR/PKD, 25.02.2020, Praveenkumar K.(Fl).

470.*Chrysophyllum oliviforme* L., Syst. Nat. ed. 10. 2: 937. 1759; Vink, Blumea 9: 26. 1958; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 207. 2004.*Chrysophyllum cainito* auct non L., 1753; Gamble, Fl. Pres. Madras 759(533). 1921.

Distribution : Native of West Indies

Trees. Leaves simple, Alternate, distichous, elliptic, elliptic-oblong, ovate or elliptic-ovate. Flowers bisexual, white. Fruit a berry, blue to purplish-black; oblong-ovoid; seeds 1-2, laterally compressed.

Flowering & Fruiting : July-September

Notes **:** It is an Exotic, a Garden and an Edible plant.

471.*Madhuca longifolia* (Koenig) Macbr. var. *latifolia* (Roxb.) A. Chev., Rev. Int. Bot. Appl. Agric. Trop. 23: 149. 1943; E. Vajr., Fl. Palghat Dist. 267. 1990.*Bassia latifolia* Roxb., Pl. Corom. t.20.1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 544.1882; Gamble, Fl. Pres. Madras 763(536). 1921.*Madhuca indica* J. Gmelin, Syst. Nat. 2: 799. 1791; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 208. 2004.*Madhuca latifolia* (Roxb.) J.F. Macbr. in Contr. Gray Herb. Harv. Univ. (ns) 53: 17. 1918.

Malayalam Name : Ilupa, Irippa, Njannal

Distribution : India and Myanmar

Trees; exudation milky. Leaves simple, Alternate, clustered at the end of branchlets. Flowers bisexual, creamy-white, axillary fascicles.. Fruit a berry, ovoid, greenish, fleshy, tawny-tomentose without, pedicel stout; seeds 2 or 3, oblong-ellipsoid.

Flowering & Fruiting : December-July

Notes **:** It is a Medicinal plant.

472.*Mimusops elengi* L., Sp. Pl. 349. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 3: 548. 1882; Gamble, Fl. Pres. Madras 765(538). 1921; Sasidh., Fl. Parambikulam WLS 180. 2002; Biodiv. Doc. Kerala- Fl. Pl. 208. 2004. (Plate 2 E).

Malayalam Name : Bakulam, Elanchi, Elangi, Mukura

Distribution : Indo-Malesia

Evergreen trees, exudation milky.Leaves simple, Alternate, spiral,; elliptic or elliptic-oblong, glabrous. Flowers bisexual, white, fragrant. Fruit a berry, yellow, ovoid, fleshy, epicarp thin; seed usually 1, oblong-ellipsoid, laterally compressed.

Flowering & Fruiting : December-August

Notes : It is a Medicinal plant.

Herbarium: Coll.No.90.PBK/KVS/ALT/PKD, 30.01.2021, Praveenkumar K.(Fl).

CII. SCROPHULARIACEAE

473.*Bonnaya ciliata* (Colsm.) Spreng., Syst. Veg. 1: 41. 1824. *Lindernia ciliata* (Colsm.) Pennell, Brittonia 2: 182. 1936, var. *ciliata*; E. Vajr., Fl. Palghat Dist. 324. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 323. 2004. *Gratiola ciliata* Colsm., Prodr. Desc. Grat. 14. 1793.*Gratiola serrata* Roxb., Fl. Ind. 1: 140. 1820.*Ilysanthes serrata* (Roxb.) Urban, Berl. Deutsch. Bot. Ges. 2: 436. 1884; Gamble, Fl. Pres. Madras 962(675). 1923.*Bonnaya brachiata* Link & Otto, Ic. Pl. Select. 25, t.11. 1820; Hook. f., Fl. Brit. India 4: 284. 1884.*Lindernia bracteoides* (Blatt. & Hallb.) Mukerjee, J. Indian Bot. Soc. 24: 133. 1945. **Linderniaceae** (APG).

Distribution : Tropical & Subtropical Asia to Northern Australia

Small erect annual herbs. Leaves simple, opposite, elliptic-oblong. Flowers in lax terminal racemes. Calyx-lobes 5, linear. Corolla pink or bluish-pink. Capsule, linear, septum winged, exceeding the fruiting calyx; seeds black.

Flowering & Fruiting : June-October.

474.*Scoparia dulcis* L., Sp. Pl. 116. 1753; Hook. f., Fl. Brit. India 4: 289. 1884; Gamble, Fl. Pres. Madras 964(678). 1924; E. Vajr., Fl. Palghat Dist. 326. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 326. 2004. **Plantaginaceae** (APG).

Malayalam Name : Kallurukki, Karakanjavu, Meenanganni

Distribution : Native of Tropical America; now Pantropical

Erect annual or perennial herbs. Leaves simple, decussate to whorled, obovate-oblong. Flowers axillary, solitary or 2; white, rotate, throat densely hairy, lobes spathulate. Capsules globose; seeds many, 4-angled, reticulate.

Flowering & Fruiting : Throughout the year

Notes: It is a Medicinal, an Exotic and a Weed plant. Dried plants tied together and used as brooms Leaf extracts taken orally for the relief of rheumatic pains.

Herbarium:Coll.No.193.ANK/TCK/MKD/PKD,25.02.2022,PraveenkumarK.(Fl)

475.*Torenia bicolor* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 38. 1851; Hook. f., Fl. Brit. India 4: 278. 1884; Gamble, Fl. Pres. Madras 957(672). 1923; E. Vajr., Fl. Palghat Dist. 327. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 327. 2004. **Linderniaceae** (APG). (Plate 12 E).

Malayalam Name : Kakkapoovu

Distribution : Western Ghats (Endemic)

Decumbent annual herbs. Leaves opposite, triangular-ovate. Flowers axillary, solitary or in pairs deep purple or tube yellowish in colour. Capsule oblong, included; seeds subglobose, rugose.

Flowering & Fruiting : Throughout the year.

Herbarium: Coll.No.51. PTT/TCK/MKD/PKD,29.05.2020,Praveenkumar K.(Fl).

476.*Torenia crustacea* (L.) Cham. & Schltdl. in Linnaea 2: 570. 1827.*Capraria crustacea* L., Mant. Pl. 1: 87. 1767.*Lindernia crustacea* (L.) F.v. Muell., Syst. Cens. Austral. Pl. 1: 97. 1882; E. Vajr., Fl. Palghat Dist. 324. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 323. 2004. *Vandellia crustacea* (L.) Benth., Scroph. Ind. 35. 1835; Hook. f., Fl. Brit. India 4: 274. 1884; Gamble, Fl. Pres. Madras 959(673). 1923. **Linderniaceae** (APG).

Distribution : Africa, America and Tropical and Subtropical Asia

Prostrate, diffusely branched herbs, rooting at nodes. Leaves simple, opposite, ovate. Flowers axillary, solitary or 2-per node on terminal racemes. Calyx lobes elliptic-lanceolate, ciliate on margins. Corolla rose to purple. Capsule c. 5 mm long, 2-3 mm across, ovoid; seeds minute, many.

Flowering & Fruiting : August-November

Notes : It is a Weed plant.

Herbarium:Coll.No.173.TBK/TCK/MKD/PKD,12.01.2022,PraveenkumarK.(Fl).

CIII. SIMAROUBACEAE

477.*Ailanthus triphysa* (Dennst.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.) 41: 1931; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 84. 2004; *Adenanthera triphysa* Dennst., Schluss. Hort. Malab. 15, 18, 32. 1818.*Ailanthus malabarica* DC., Prodr. 2: 89. 1825; Bennett in Hook. f., Fl. Brit. India 1: 158. 1875; Gamble, Fl. Pres. Madras 163(116). 1915.

Malayalam Name : Matti, Perumaram, Pongilium

Distribution : Indo-Malesia and Australia

Lofty deciduous trees. Leaves imparipinnate, Alternate, crowded towards the apex of branches. Flowers polygamous, greenish-yellow, in axillary panicles. Fruit a samara, 1-5, oblong, prominently veined, not twisted, reddish-brown with rounded ends.

Flowering & Fruiting : January-May

Notes : It is a Medicinal plant.

478.*Quassia amara* L., Sp. Pl. (ed.2) 553. 1762; M. Mohanan & A.N. Henry, Fl. Thiruvananthapuram 106. 1994; R.K. Basak in Hajra *et al.* (eds.), Fl. India 4: 421. 1997; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 84. 2004. (Plate 15 F).

Distribution : Native of Tropical America

Erect shrubs. Leaves Alternate, pinnately compound. Racemes often branched, red; pedicels accrescent; bracts spathulate. Calyx bright red. Petals bright red outside, whitish inside, not spreading, tubular. Stamens longer than the petals, slightly unequal.

Flowering & Fruiting : January-November

Notes : It is an Exotic and a Garden plant.

479.*Samadera indica* Gaertn., Fruct. 2: 352, t. 156. f. 3. 1791; Bennett in Hook. f., Fl. Brit. India 1: 519. 1875; Gamble, Fl. Pres. Madras 163(117). 1915. *Quassia indica* (Gaertn.) Nooteb. in Steenis, Fl. Males. ser.1. 6: 199. 1962; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 85. 2004.*Samadera lucida* (Wall.) Planch. in Hook.'s J. Bot. Kew Gard. Misc. 5: 562. 1846.

Malayalam Name : Njotta, Karinjotta

Distribution : India, Myanmar, Sri Lanka and Tropical Africa

Evergreen tree or shrub. Leaves simple, Alternate, elliptic-oblong, glabrous, shining. Flowers 20 or more in umbelliform glabrous or puberulous inflorescences. Petals 4, free, white, pale yellow or purplish. Drupes 1-4 together, flat, semi-orbicular, smooth, glandular and reticulate; seed solitary.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and a Garden plant.

Herbarium:Coll.No.213.KPS/TCK/MKD/PKD,20.12.2022,Praveenkumar K.(Fl).

480.*Simarouba amara* Aubl., Hist. Pl. Guiane 860 1775.*Quassia simaruba* L. f., Suppl. Pl. 234. 1782.*Simarouba glauca* DC., Ann. Mus. Natl. Hist. Nat. 17: 424. 1811.

Malayalam Name : Lakshmitharu

Distribution : Native of Tropical America

Medium sized trees. Leaves Alternate, odd pinnate, sometimes even pinnate; leaflets 5-7 pairs, Alternate. Panicles polygamous, terminal. Petals greenish-yellow, oblong, recurved. Disc villous. Stamens 10, Alternate staminal filaments shorter. Fruit ovoid, with glossy purple; seed one.

Flowering & Fruiting : January-May

Notes : It is a Medicinal, an Exotic and a Garden plant.

CIV. SMILACACEAE

481.*Smilax zeylanica* L., Sp. Pl. 1029. 1753; Hook. f., Fl. Brit. India 6: 309. 1892; Gamble, Fl. Pres. Madras 1518(1061). 1928; Vajr., Fl. Palghat Dist. 511. 1990; *Smilax macrophylla* Roxb., Fl. Ind. 3: 793. 1832; Hook. f., Fl. Brit. India 6: 310. 1892. (Plate 8 E).

Malayalam Name : Arikanni, Kareelanchi, Karilanchi, Kozhimullu,

Distribution : Tropical Asia

Climbing shrubs; stem prickly. Leaves simple, Alternate, ovate-oblong or ovate-lanceolate. Umbels axillary, 1-3. Flowers unisexual; bracts oblong. Perianth 6-partite, free, greenish, oblong. Stamens in male flowers 6, free; filaments flat, apex callose; pistillode 0. Ovary in female flowers 3-lobed, 3-celled; ovules 1 or 2 per cell; style 3-fid; staminodes 3-6. Berry; seeds 1-3, , globose.

Flowering & Fruiting : July-January.

Notes : It is a Medicinal plant. Juice of young leaves and twigs taken as aphrodisiact.

Herbarium:Coll.No.115.EKT/TCK/MKD/PKD,13.03.2021,PraveenkumarK.(Fl).

CV. SOLANACEAE

482.*Capsicum frutescens* L., Sp. Pl. 189. 1753; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 314. 2004.*Capsicum annuum* L. var. *frutescens* (L.) Kuntze, Rev. Gen. Pl. 2: 449. 1891.*Capsicum minimum* C.B. Clarke in Hook. f., Fl. Brit. India 4: 239. 1883, p.p

Malayalam Name : Kantharimulaku, Palmulaku, Vellakanthari

Distribution : Tropical America; widely cultivated

Shrubby perennials. Leaves simple, Alternate and opposite, ovate-lanceolate. Flowers usually 2-3 per node, erect. Corolla white, lobes 5, triangular-ovate, puberulous without. Fruit green or white, red on ripening, gradually tapering towards apex, erect; seeds many, compressed, circular.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal and an Exotic plant.

483.*Physalis angulata* L., Sp. Pl. 183. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 238. 1883; Gamble, Fl. Pres. Madras 939(659). 1923; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 315. 2004.*Physalis minima* L., Sp. Pl. 183. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 238. 1883; Gamble, Fl. Pres. Madras 939(659). 1923; E. Vajr., Fl. Palghat Dist. 316. 1990.

Malayalam Name : Ajodinjotta, Njodinjotta, Njottanjodian, Pottichedi

Distribution : Native of Tropical & Subtropical America, now widespread inTropical Asia, Africa and Australia

Annual herbs. Leaves simple, Alternate, ovate or elliptic-lanceolate. Flowers axillary, solitary. Corolla pale-yellow with a purple base, campanulate. Berry globose, enclosed by the inflated calyx; seeds many, discoid, minutely rugose.

Flowering & Fruiting : July-December

Notes : It is a Medicinal, an Exotic and an Edible plant.

Herbarium: Coll.No.174.CST/TVP/PTB/PKD, 12.01.2022, Praveenkumar K.(Fl).

484.*Solanum diphyllum* L., Sp. Pl. 1: 184. 1753; Sunil, Fl. Pl. Diver. Ernakulam Dist. 269. 2016.

Distribution : Native of Central America

Unarmed subshrubs. Leaves unequally paired, entire, elliptic to oblong. Cymes axillary, peduncle unbranched, later with conspicuous pedicel scars. Corolla white, lobes 5, glabrous. Stamens 5, filament glabrous,; anther glabrous. Ovary

glabrous, style glabrous. Fruit orange-yellow, glabrous,; persistent sepals curved upward; seeds yellow or tan, reniform-discoid, margins thickened.

Flowering & Fruiting : January-June

Notes : It is a Medicinal and an Exotic plant.

485.*Solanum torvum* Sw., Prodr. 47. 1788; C.B. Clarke in Hook. f., Fl. Brit. India 4: 234. 1883; Gamble, Fl. Pres. Madras 937(658). 1923; E. Vajr., Fl. Palghat Dist. 320. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 317. 2004.

Malayalam Name : Anachunda, Chunda, Chithiramchunda.

Distribution : Throughout the tropics

Shrubs; stem densely stellate-hairy when young. Leaves ovate, usually coarsely 2-3-sinulate, stellately pubescent on both sides. Inflorescence supra-axillary, many-flowered corymbose cymes;. Calyx campanulate, lobes oblong. Corolla white; ovate, pubescent outside. Berry globose, pale green turning dull orange; seeds discoid, smooth.

Flowering & Fruiting : July-March

Notes : It is a Medicinal plant.

Herbarium:Coll.No.47.PKM/CVA/OTP/PKD,17.07.2021, Praveenkumar K.(Fl).

486.*Solanum violaceum* Ortega, Nov. Pl. Descr. Dec. 56. 1798; Hepper in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 6: 378. 1987; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 318. 2004.*Solanum anguivi* auct. non Lam.: E. Vajr., Fl. Palghat Dist. 318. 1990; *Solanum indicum* C.B. Clarke in Hook. f., Fl. Brit. India 4: 234. 1883, non L. 1753; Gamble, Fl. Pres. Madras 938(658). 1923. (Plate 5 E).

Malayalam Name : Chunda, Puthirichunda

Distribution : Indo-Malesia

Armed undershrubs; branches minutely stellate-hairy on young parts. Leaves ovate or ovate-oblong, sinuately to deeply lobed, prickly on the nerves. Flowers bluish-violet in extra-axillary racemes. Calyx cupular; lobes 5, triangular,

prickly. Corolla campanulate. Stamens 5. Ovary globose; stigma acute. Berry globose; orange yellow when ripe.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.57.PKM/CVA/OTP/PKD,19.07.2020, Praveenkumar K.(Fl).

CVI. STERCULIACEAE

487.*Helicteres isora* L., Sp. Pl. 963. 1753; Mast. in Hook. f., Fl. Brit. India 1: 365. 1874; Dunn in Gamble, Fl. Pres. Madras 107(77). 1915; E. Vajr., Fl. Palghat Dist. 89. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 57. 2004. **Malvaceae** (APG).

Malayalam Name : Edampiri-Valampiri.

Distribution : Indo-Malesia, China and Australia

Large shrubs to small trees. Leaves simple, Alternate, obovate to suborbicular,. Flowers axillary, solitary or in few-flowered cymes; linear, 2 brown glands present in the axil of bracts. Calyx slightly yellow, persistent, tubular, splitting in to 5 irregular lobes; tube densely stellate hairy without. Petals 5, unequal, obovate, clawed, crimson, fading to pale blue. Follicles 5, spirally twisted, stellate-tomentose, beaked; seeds angular, black, wrinkled.

Flowering & Fruiting : September-March

Notes : It is a Medicinal plant.

488.*Melochia corchorifolia* L., Sp. Pl. 675. 1753; Mast. in Hook. f., Fl. Brit. India 1: 374. 1874; Dunn in Gamble, Fl. Pres. Madras 110(79). 1915; Sasidh., Fl. Parambikulam WLS 33. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 58. 2004. **Malvaceae**(APG).

Malayalam Name : Cheruooram, Cheruvuram

Distribution : Paleotropics

Erect branched herbs. Leaves simple, Alternate, varying in size and shape. Flowers pink in terminal, capitate cymes; linear-lanceolate, ciliate on margins..

Capsule, subglobose, 5- valved; seeds angular or plano-convex, dark brown or greyish.

Flowering & Fruiting : July-April.

Herbarium: Coll.No.28.AKV/NSY/PTB/PKD, 21.02.2020, Praveenkumar K.(Fl).

489.*Sterculia balanghas* L., Sp. Pl. 1007. 1753; Mast. in Hook. f., Fl. Brit. India 1: 358. 1874; Dunn in Gamble, Fl. Pres. Madras 106(76). 1915; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 59. 2004. **Malvaceae** (APG).

Malayalam Name : Narthondi, Pavizhathondi

Distribution : Indo-Malesia

Deciduous trees, bole buttressed.. Leaves simple, elliptic, obovate, oblong, glabrescent above, stellate hairy to velvety beneath Alternate. Flowers unisexual or polygamous, greenish-purple, in terminal or axillary panicles. Female flowers: carpels 5, free, superior; stigma recurved; as long as styles. Fruit of 4-5, woody follicles, horizontally spreading, orange-red, oblong, rusty tomentose; seeds oblong, black, shiny.

Flowering & Fruiting : June-August.

Herbarium:Coll.No.125.TKT/NSY/PTB/PKD, 11.04.2021, Praveenkumar K.(Fl).

490.*Sterculia guttata* Roxb. ex DC., Prodr. 1: 482.1824; Mast. in Hook. f., Fl. Brit. India 1: 355.1874; Dunn in Gamble, Fl. Pres. Madras 106(76). 1915; E. Vajr., Fl. Palghat Dist. 91. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 59. 2004. **Malvaceae** (APG).

Malayalam Name : Thondi, Thenpokka

Distribution : Indo-Malesia

Deciduous trees. Leaves simple, Alternate, broadly ovate-oblong, ovate or broadly obovate-oblong. Flowers polygamous, white, dotted with pink, arranged in simple cymes of 3, also on peduncle of short rusty-pubescent axillary racemes; bracts lanceolate. Calyx greenish out side, reddish inside,

campanulate. Fruit an aggregate of 1-5 radiating follicles; seeds ovoid, black, smooth, shining.

Flowering & Fruiting : September-March

Notes : It is a Medicinal plant .Seeds eaten.

491.Sterculia urens Roxb., Pl. Corom. t. 24. 1795; Mast. in Hook. f., Fl. Brit. India 1: 355. 1874; Dunn in Gamble, Fl. Pres. Madras 106(75). 1915; E. Vajr., Fl. Palghat Dist. 91. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 59. 2004. **Malvaceae** (APG).

Malayalam Name : Annanvazhukki, Kithondi, Paravakka.

Distribution : Indo-Malesia

Deciduous trees. Leaves simple, palmately 3-5 lobed, Alternate, clustered at the tips of branchlets, orbicular, glabrous above, velvety pubescent beneath. Flowers polygamous, greenish-yellow, in axillary panicles, sticky tomentose of glandular, stellate hairs. Fruit an aggregate of 4-6 follicles, red, densely pubescent, mixed with stinging hairs; seeds 3-6, brown or black, oblong.

Flowering & Fruiting : October-April

Notes : It is a Medicinal plant.

CVII. THYMELAEACEAE

492.*Aquilaria malaccensis* Lam., Encycl. 1: 49. 1783; Hook. f., Fl. Brit. India 5: 200. 1886.*Aquilaria agallocha* Roxb., Hort. Bengal. 33. 1814; Hook. f., Fl. Brit. India 5: 199. 1886.

Malayalam Name : Outh, Ooth

Distribution : South East Asia

Evergreen trees. Leaves simple, Alternate, elliptic-oblong to oblong-lanceolate,. Flowers white-yellow; tube 10-ribbed, densely puberulous within, lobes reflexed; Fruit a dehiscent capsule,greenish.

Flowering & Fruiting : April-September

Notes : It is a Medicinal, an Exotic and a Garden plant.

CVIII. TILIACEAE

493.*Corchorus aestuans* L., Syst. Nat. (ed. 10) 1079. 1759; E. Vajr., Fl. Palghat Dist. 92. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 60. 2004.*Corchorus acutangulus* Lam., Encycl. 2: 104. 1786 non Forssk. 1775; Mast. in Hook. f., Fl. Brit. India 1: 398. 1874; Dunn in Gamble, Fl. Pres. Madras 121(86). 1915. **Malvaceae** (APG).

Distribution : Pantropical

Annual, much branched, spreading herbs. Leaves simple, Alternate, ovate to elliptic-lanceolate. Flowers 2-3 in leaf-opposed, shortly pedunculate cymes. Petals 5, yellow, obovate, obtuse. Capsules 3-loculed. Seeds numerous, dark brown.

Flowering & Fruiting : August-February.

Herbarium: Coll.No. 41.MVK/PTR/PTB/PKD,13.04.2020, Praveenkumar K.(Fl).

494.*Grewia abutilifolia* Vent. ex Juss., Ann. Mus. Natl. Hist. Nat. Paris 4: 92. 1804; Mast. in Hook. f., Fl. Brit. India 1: 390. 1874; E. Vajr., Fl. Palghat Dist. 93. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 61. 2004.*Grewia aspera* Roxb., Fl. Ind. 2: 591. 1832; Dunn in Gamble, Fl. Pres. Madras 119(85). 1915. **Malvaceae** (APG).

Malayalam Name : Pampukonta

Distribution : Tropical & Subtropical Asia

Large shrubs. Leaves Alternate, broadly ovate to rounded, scabrous above, densely ferruginous, tomentose below. Flowers many, white, turns to yellow. Drupes fleshy, minutely stellate hairy, obscurely 4-lobed, wrinkled.

Flowering & Fruiting : Throughout the year.

Herbarium: Coll.No.66.GVK/VPZ/PTB/PKD, 03.12.2020, Praveenkumar K.(Fl).

495.*Grewia tiliifolia* Vahl, Symb. Bot. 1: 35. 1790; Mast. in Hook. f., Fl. Brit. India 1: 386. 1874, "tiliaefolia"; Drumm. in Gamble, Fl. Pres. Madras 118(84). 1915; E. Vajr., Fl. Palghat Dist. 94. 1990; Sasidh., Fl. Parambikulam WLS 37. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 63. 2004.*Grewia tiliifolia* Vahl var. *leptopetala* (Brandis) Cooke, Fl. Pres. Bombay 142. 1901.*Grewia tiliifolia* Vahl var. *argentea*

Burrett, Notizbl. Bot. Gart. Berlin-Dahlem. 9: 659. 1926.*Grewia damine* Gaertn., Fruct. 2. 1791; Dunn in Gamble, Fl. Pres. Madras 118(84). 1915; Sasidh., Fl. Chinnar WLS 45. 1999. *Grewia salvifolia* Heyne ex Roth, Nov. Pl. Sp. 329.1821; Mast. in Hook. f., Fl. Brit. India 1: 386.1874, p.p. **Malvaceae** (APG). (Plate 3 D).

Malayalam Name : Chadachi, Dhanauna-vriksham, Unnam

Distribution : India to Indo-China and Malaysia

Large trees. Leaves simple, Alternate, broadly ovate or obliquely ovate to round. Flowers bisexual, yellow, in axillary umbels. Sepals 5, pubescent. Petals 5, yellow, half the length of sepals, entire or notched, densely tomentose outside. Fruit a drupe, globose to subglobose, reddish-purple, 2-lobed, sparsely hairy.

Flowering & Fruiting : February-June

Notes : It is a Medicinal & an Edible plant. Ripe fruits eaten.

Herbarium: Coll.No.194.GVK/VPZ/PTB/PKD,15.03.2022,Praveenkumar K.(Fl).

496.*Microcos paniculata* L., Sp. Pl. 514. 1753.*Grewia microcos* L., Syst. Nat. (ed. 12) 2: 602. 1766; Mast. in Hook. f., Fl. Brit. India 1: 392. 1874; Dunn in Gamble, Fl. Pres. Madras 116(83). 1915.*Grewia ulmifolia* Roxb., Fl. Ind. 2: 591.1832.*Grewia nervosa* (Lour.) Panigrahi, Taxon 34: 702. 1985; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 62. 2004.*Fallopia nervosa* Lour., Fl. Cochinch. 336. 1790 **Malvaceae** (APG).

Malayalam Name : Cherikkotta, Kotta, Kottakka, Pottanga

Distribution : Tropical Asia

Erect bushy shrubs to small tree. Leaves simple, Alternate, elliptic-oblong or ovate-lanceolate, glabrous on ageing except the nerve on both sides. Flowers in axillary and terminal panicles; bracts linear-lanceolate. Petals 5, yellow, ovate. Stamens many. Ovary globose, 2-4-celled; ovules 2 in each cell. Drupe,globose, purple on ripening; seeds 1 or 2.

Flowering & Fruiting : August-April

Notes : It is a Medicinal plant.

497.*Triumfetta rhomboidea* Jacq., Enum. Syst. Pl. 22. 1760; Mast. in Hook. f., Fl. Brit. India 1: 395. 1874; Dunn in Gamble, Fl. Pres. Madras 120(86). 1915; E. Vajr., Fl. Palghat Dist. 95. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 64. 2004.*Triumfetta angulata* Lam., Encycl. 3: 421. 1789.*Triumfetta trilocularis* Roxb., Fl. Ind. 2: 462. 1832.*Triumfetta tungarensis* Billore, J. Econ. Tax. Bot. 3: 621. 1982. **Malvaceae**(APG)

Malayalam Name : Oorpam, Ottukayal

Distribution : Paleotropics

Erect, much-branched undershrubs with hairy stem. Leaves simple, Alternate, generally rhomboid-ovate. Flowers in terminal or leaf-opposed cymes, yellow in colour. Capsules subglobose, stellate hairy outside, setose; hooked at tip.

Flowering & Fruiting : August-January

Notes : It is a Medicinal and a Weed plant.

Herbarium:Coll.No.190.PBK/KVS/ALT/PKD,21.02.2022, Praveenkumar K.(Fl).

CIX. TRAPACEAE

498.*Trapa natans* L., Sp. Pl. 120. 1753; Vajr., Fl. Palghat Dist. 209. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 192. 2004. *Trapa natans* L. var. *bispinosa* (Roxb.) Makino, Iinuma Somoku-Dzusezii (ed.3) 1: 137. 1907.*Trapa bispinosa* Roxb., Pl. Corom. t. 234. 1815; C.B. Clarke in Hook. f., Fl. Brit. India 2: 590. 1879; Gamble, Fl. Pres. Madras 518(366). 1919. **Lythraceae** (APG).

Malayalam Name : Karimbolam, Karimpolam, Kakkamullu.

Distribution : Cosmopolitan

Aquatic herbs. Floating leaves Alternate, crowded on the upper part of the stem. Flowers few, axillary, solitary; white. Fruit obovoid, angular, excluding spines; spines 4, 2 of which are shorter.

Flowering & Fruiting : September-May

Notes : It is a Medicinal and a Weed plant.

CX. ULMACEAE

499.*Holoptelea integrifolia* (Roxb.) Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 259. 1848; Hook. f., Fl. Brit. India 5: 481. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1348(943). 1928; E. Vajr., Fl. Palghat Dist. 441. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 436. 2004. *Ulmus integrifolius* Roxb., Pl. Corom. t. 78. 1798.

Malayalam Name : Aavel, Aavil, Avelkurunnu, Njettaval, Njetavil

Distribution : South and South East Asia

Large deciduous trees. Leaves simple, Alternate, ovate-oblong, ovate or elliptic-ovate, glabrous above. Flowers polygamous, appear before leaves, greenish-purple, in axillary fascicles. Fruit a samara, orbicular, wings nerved, glabrous, seed one.

Flowering & Fruiting : December-March

Notes : It is a Medicinal plant

500.*Trema orientale* (L.) Blume, Mus. Bot. Lugd.-Bat. 2: 62. 1856 'orientalis'; Hook. f., Fl. Brit. India 5: 484. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1350(944). 1928; E. Vajr., Fl. Palghat Dist. 442. 1990: SSasidh., Biodiv. Doc. Kerala-Fl. Pl. 436. 2004. *Celtis orientalis* L., Sp. Pl. 1044. 1753.Sponia wightii Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 322. 1848. **Cannabaceae** (APG).

Distribution : Tropical Africa, Asia and Australia

Malayalam Name : Aamathali, Aarni, Amapotti, Amarathi, Ami.

Dioecious trees; branchlets scabrous to adpressed pubescent. Leaves simple, Alternate, ovate-lanceolate,. Flowers unisexual, greenish, in axillary fascicles or cymes; male flowers usually sessile. Female flowers: tepals unequal, ciliate. Fruit a drupe, globose, black; stylar tip persistent; seed globose.

Flowering & Fruiting : September-December.

Herbarium: Coll.No.108.PMK/NSY/PTB/PKD,25.02.2021,Praveenkumar K.(Fl).

CXI. URTICACEAE

501.*Laportea interrupta* (L.) Chew, Gard. Bull. Singapore 21: 200. 1965; E. Vajr., Fl. Palghat Dist. 453. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 433. 2004.*Urtica interrupta* L., Sp. Pl. 985. 1753.*Fleurya interrupta* (L.) Gaud., Voy. Uranie 12: 497. t. 8. 1830; Hook. f., Fl. Brit. India 5: 548. 1888; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1372(959). 1928.

Malayalam Name : Anachorian, Choriyanam, Chenthotti.

Distribution : Tropical & Subtropical Africa, Asia to NW. Pacific

Erect monoecious annual herbs with stinging hairs. Leaves simple, Alternate, broadly ovate. Flowers in short, cymose clusters aggregated in slender lax, axillary spikes. Male flowers: tepals 4, ovate, concave; stamens 4, filaments unequal; pistillode linear, clavate. Female flowers: tepals 4, unequal, basally connate into a cup; ovary obliquely attached, ovoid, style lateral, filiform. Achenes, ovoid.

Flowering & Fruiting : August-September

Notes : It is a Medicinal plant.

502.*Pilea microphylla* (L.) Liebm., Vidensk. Selsk. Skr. 5: 296. 1851; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1379(965). 1928; Sasidh., Fl. Parambikulam WLS 304. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 434. 2004.*Parietaria microphylla* L., Syst. Nat. (ed.10): 1308. 1759.*Pilea muscosa* Lindl., Coll. Bot. t. 4. 1821; Hook. f., Fl. Brit. India 5: 551. 1888.

Distribution : South America; now introduced into other tropical regions

Slender succulent herbs. Leaves simple, opposite, ovate-orbicular. Flowers monoecious in small umbellate clusters. Male flowers: tepals 4, free, concave, obtuse; stamens 4. Female flowers: tepals connate, 2-4-toothed; ovary ovoid, 1-celled; ovule 1. Achene ellipsoid.

Flowering & Fruiting : August-November

Notes : It is an Exotic and a Weed plant.

Herbarium:Coll.No.15.ABK/AKR/PTB/PKD, 04.02.2020., Praveenkumar K.(Fl).

503.*Pouzolzia zeylanica* (L.) Bennett, Pl. Jav. Rar. 1: 67. 1838; E. Vajr., Fl. Palghat Dist. 457. 1990; *Parietaria zeylanica* L., Sp. Pl. 1052. 1753.*Parietaria indica* L., Mant. Pl. 1: 128. 1767.*Pouzolzia indica* (L.) Gaud., Voy. Uranie 12: 503. 1830; Hook. f., Fl. Brit. India 5: 581. 1888; Gamble, Fl. Pres. Madras 1382(967). 1928.

Malayalam Name : Kallurukki, Neicheera

Distribution : Tropical Asia

Slender procumbent herbs. Leaves simple, Alternate, ovate-ellipticsparsely strigose, membranous. Flowers in axillary, subsessile clusters. Male flowers: tepals 4, ovate-lanceolate, sparsely villous; stamens 4. Female flowers: tepals connate; style linear thinly pubescent. Achenes 2-winged.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant.

Herbarium:Coll.No.208.KNK/PTR/PTB/PKD,21.11.2022.,Praveenkumar K.(Fl).

CXII. VERBENACEAE

504.*Citharexylum spinosum* L., Sp. Pl.: 625. 1753; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 357. 2004. *Citharexylum fruticosum* L., Syst. Nat. ed. 10, 2: 1115. 1759.*Citharexylum cinereum* L., Sp. Pl. ed. 2: 872. 1763.*Citharexylum subserratum* Sw., Nov. Gen. Pl. 91. 1788.*Citharexylum fruticosum* L. var. *subserratum* (Sw.) Moldenke, Phytologia 1: 17. 1933; E. Vajr., Fl. Palghat Dist. 370. 1990.*Citharexylum fruticosum* f. *subserratum* (Sw.) Moldenke, Phytologia 36: 164. 1977. **Lamiaceae** (APG). (Plate 14 G).

Malayalam Name : Parijatham

Distribution : Native of West Indies; introduced and naturalised in many other countries

Shrubs or trees. Leaves decussate-opposite, Alternate or subopposite, ternate or verticillate. Inflorescence axillary and terminal, racemiform or spicate, simple or branched, erect or drooping; flowers numerous. Corolla white, infundibular or

hypocrateriform. Fruit a drupe, partly enclosed by the enlarged calyx; pyrenes 2-loculed and 2 -seeded.

Flowering & Fruiting : April-September

Notes : It is an Exotic plant

505.*Clerodendrum infortunatum* L., Sp. Pl. 637. 1753, non L. 1771; C.B. Clarke in Hook. f., Fl. Brit. India 4: 594. 1885; Gamble, Fl. Pres. Madras 1100(770). 1924.*Clerodendrum viscosum* auct. non Vent. 1804: E. Vajr., Fl. Palghat Dist. 365. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 359. 2004. **Lamiaceae** (APG).

Malayalam Name : Peruku, Peruvu.

Distribution : Indo-Malesia and China

Stoloniferous shrubs. Leaves simple, opposite, ovate or orbicular. Panicle terminal, villous; bracts foliaceous. Corolla white, tubular; villous without; oblong, hairy without. Drupe globose, bluish-black on ripening; fruiting calyx enlarged, pink; seeds 2-4, globose.

Flowering & Fruiting : December-February

Notes : It is a Medicinal plant. Juice of young leaves given after child birth for removal of placenta. Also used against fever.

Herbarium:Coll.No.158.MNK/CVA/OTP/PKD,12.12.2021,PraveenkumarK.(Fl)

506.*Clerodendrum paniculatum* L., Mant. Pl. 1: 90. 1767, "paniculata"; C.B. Clarke in Hook. f., Fl. Brit. India 4: 593. 1885; Vivek., Bull. Bot. Surv. India 10: 240. 1969; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 358. 2004. **Lamiaceae** (APG).

Malayalam Name : Krishnakireedam, Hanumankireedam

Distribution : Indo-Malesia

Erect subshrubs, stoloniferous; stem scarcely branched. Leaves simple, opposite, margin faintly lobed, denticulate. Flowers in terminal panicles of dichotomous cymes; pedicels reddish. Calyx deeply 5-lobed, red, campanulate. Corolla red, hypocrateriform; tube slender. Fruit setting not common.

Flowering & Fruiting : July-December

Notes : It is an Exotic and a Garden plant.

Herbarium:Coll.No.120.MNK/CVA/OTP/PKD,25.03.2021,PraveenkumarK.(Fl)

507.*Gmelina arborea* Roxb., Pl. Corom. t. 246. 1815; C.B. Clarke in Hook. f., Fl. Brit. India 4: 581. 1885; Gamble, Fl. Pres. Madras 1097(768). 1924; E. Vajr., Fl. Palghat Dist. 365. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 359. 2004. **Lamiaceae** (APG).

Malayalam Name : Kumbil, Kumizhanpazham, Kumizhu, Sevana

Distribution : Indo-Malesia, Introduced elsewhere

Deciduous trees. Leaves simple, opposite, broadly ovate or ovate. Flowers bisexual, yellow with orange-pink shade, in terminal panicles. Calyx campanulate. Corolla bilabiate. Stamens 4, didynamous; Ovary superior, syncarpous, glabrous, ovules 4; style slender, glabrous, unequally bifid. Fruit a drupe ovoid, pulpy, pyrene bonny, ovoid with a deep depression, yellow; seeds 2-4, elliptic.

Flowering & Fruiting : January-June

Notes : It is a Medicinal plant

508.*Gmelina asiatica* L., Sp. Pl. 626. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 582. 1885; Gamble, Fl. Pres. Madras 1098(768). 1924; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 359. 2004. **Lamiaceae** (APG).

Malayalam Name : Cherukumuzhu, Chulungu.

Distribution : India to South East Asia

Large shrubs to small trees. Leaves simple, opposite, ovate,. Racemes terminal or axillary, pubescent; flowers golden yellow. Calyx tube campanulate, with large glands, tomentose. Corolla tube ventricose, lobes pubescent. Longest stamens. Drupe.

Flowering & Fruiting : November-December

Notes : It is a Medicinal plant.

509.*Lantana camara* L., Sp. Pl. 627.1757. *Lantana aculeata* L., Sp. Pl. 627. 1753; Gamble, Fl. Pres. Madras 1087(761). 1924.*Lantana camara* L. var. *aculeata* (L.) Moldenke, Torreya 34: 9. 1934; C.B. Clarke in Hook. f., Fl. Brit. India 4: 562. 1885; E. Vajr., Fl. Palghat Dist. 366. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 360. 2004.*Lantana camara* L. var. nana Moldenke, Phytologia 28: 402. 1974. **Lamiaceae** (APG). (Plate 13 C).

Malayalam Name : Arippoochedi, Poochedi.

Distribution : Native of Tropical America, widely naturalised in the tropics and subtropics

Much branched scandent shrubs. Leaves simple, opposite, ovate or elliptic-ovate, margin creneate-serrate. Flowers sessile, orangish-red, changing to deep red on ageing. Drupe, globose, purple on ripening; seeds reticulate.

Flowering & Fruiting : April-June

Notes : It is an Exotic, a Garden and a Weed plant.

Herbarium:Coll.No.120.PKM/CVA/OTP/PKD,16.02.2021,PraveenkumarK.(Fl).

510.*Lantana splendens* Medic., Hist. & Commentat, Acad. Elect. Sci. Theod.-Palat. 3: 226. 1756.*Lantana camara* L., Sp. Pl. 627. 1753, var. *splendens* (Medic.) Moldenke, Phytologia 33: 130. 1976Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 360. 2004. **Lamiaceae** (APG).

Distribution : Native of Tropical and subtropical America

Much branched shrubs. Leaves opposite or ternate, crenate, ovate, acute. Flowers in capitate spikes; bracts ovate- lanceolate, closely imbricate, persistent. yellow changes to orange-yellow.Drupe bluish-black, globose, fleshy, enclosing two 1-seeded pyrenes; seeds reticulate.

Flowering & Fruiting : Throughout the year

Notes : It is an Exotic, a Garden and a Weed plant

511.*Phyla nodiflora* (L.) Greene, Pittonia 4: 46. 1899; E. Vajr., Fl. Palghat Dist. 367. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 361. 2004. *Verbena nodiflora* L., Sp.

Pl. 20.1753.*Lippia nodiflora* (L.) A. Rich. in Michx., Fl. Bor. Amer. 2: 15. 1803; C.B. Clarke in Hook. f., Fl. Brit. India 4: 563. 1885; Gamble, Fl. Pres. Madras 1088(762). 1924. **Lamiaceae** (APG).

Malayalam Name : Kattuthippali, Neerthippali

Distribution : Tropics and subtropics

Prostrate herbs. Leaves simple, opposite, obovate-spathulate or oblanceolate. Flowers sessile, aggregated in axillary, globose-capitate or elongate, cylindric, stalked spikes; peduncle solitary in each axil; bracts small, closely imbricate, obovate. Corolla pink to white, salver-form, 2-lipped, upper lip 2-lobed, emarginate, lower 3-lobed. Stamens 4, included. Drupe enclosing two, 1-celled pyrenes.

Flowering & Fruiting : November-December

Notes : It is a Medicinal plant

512.*Rotheca serrata* (L.) Steane & Mabb., Novon 8: 206. 1998.*Volkameria serrata* L., Mant. Pl. 1: 90. 1767.*Clerodendrum serratum* (L.) Moon, Cat. Pl. Ceylon 46. n.382. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 4: 592.1885; Gamble, Fl. Pres. Madras 1100(770). 1924; E. Vajr., Fl. Palghat Dist. 365. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 359. 2004.*Cyclonema serratum* (L.) Hochst., Flora 25: 227. 1842. **Lamiaceae**(APG).

Malayalam Name : Cheruthekku, Kankabharnni, Kantani.

Distribution : India, Nepal, Myanmar and Sri Lanka

Shrubs; stems and branches purplish. Leaves simple, opposite, or ternate. Inflorescence elongate, terminal cymose panicles, pubescent. Drupe 4-lobed, subglobose, dark-purple; seeds 2-4, globose.

Flowering & Fruiting : August-December

Notes : It is a Medicinal plant

513.*Tectona grandis* L. f., Suppl. Pl. 151. 1781; C.B. Clarke in Hook. f., Fl. Brit. India 4: 570. 1885; Gamble, Fl. Pres. Madras 1092(765). 1924; E. Vajr., Fl. Palghat Dist. 369. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 363. 2004. **Lamiaceae**(APG).

Malayalam Name : Thekku

Distribution : South and South East Asia, introduced and cultivated elsewhere

Deciduous trees, bark, yellowish-brown, rough. Leaves simple, opposite, , ovate, obovate. Flowers bisexual, white, in terminal cymose panicles. Fruit a drupe, globose, brown, densely floccose hairy, covered by the inflated calyx, epicarp spongy, endocarp stony; seeds 1-4, oblong.

Flowering & Fruiting : May-January

Notes : It is a Medicinal plant.

Herbarium:Coll.No.164.PBK/KVS/ALT/PKD,21.12.2021.,Praveenkumar K.(Fl).

514.*Vitex altissima* L. f., Suppl. Pl. 294. 1781; C.B. Clarke in Hook. f., Fl. Brit. India 4: 584. 1885; Gamble, Fl. Pres. Madras 1102(772). 1924; E. Vajr., Fl. Palghat Dist. 370. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 363. 2004.*Vitex alata* Willd., Gen. Naturf. Fr. New Schr. 4: 203. 1803, non Heyne ex Roth 1821; C.B. Clarke in Hook. f., Fl. Brit. India 4: 584. 1885; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 363. 2004. *Vitex altissima* L. f. var. *alata* (Willd.) Trimen, Handb. Fl. Ceylon 3: 358. 1895. **Lamiaceae**(APG).

Malayalam Name : Myila, Mylellu

Distribution : India, Indo-China, Malesia and Sri Lanka

Trees, bark greyish-yellow. Leaves compound, opposite. Flowers bisexual, white, tinged with blue, in terminal panicles. Fruit a drupe, smooth, globose, glabrous, blue, supported by enlarged calyx; seeds 4, obovate.

Flowering & Fruiting : March-July

515.*Vitex negundo* L., Sp. Pl. 638. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 583. 1885; Gamble, Fl. Pres. Madras 1102(771). 1924; E. Vajr., Fl. Palghat Dist.

370. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 363. 2004.*Vitex negundo* L. var. *purpurascens* Sivar. & Moldenke, Phytologia 28: 404. 1974; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 363. 2004.*Vitex negundo* L. f. albiflora H.W.Jen & Y.J.Chang,J. Beijing Forest. Univ. 13(3): 2. 1991. **Lamiaceae** (APG). (Plate 5 H).

Malayalam Name : Indrani, Karinochi, Nochi, Vellanocchi, Vennochi

Distribution : Indo-Malesia and China, cultivated throughout the tropics

Shrubs or small trees; purple or pale white pubescent all over, aromatic. Leaves opposite, leaflets narrowly oblong or elliptic to lanceolate. Panicles terminal. flowers pale purple to violet, hypocrateriform. Drupe globose, purple or black.

Flowering & Fruiting : February-July

Notes : It is a Medicinal and an Exotic plant. Leaves are boiled in water and the water is used in bathing fot paralysis. Juice of leaves given to the children for eradication of worms.

Herbarium:Coll.No.18.TVK/PTK/ALT/PKD, 09.02.2020., Praveenkumar K.(Fr).

CXIII. VIOLACEAE

516.*Pigea enneasperma* (L.) P.I. Forst., Austrobaileya 11: 29. 2021.*Afrohybanthus enneaspermus* (L.) Flicker, Phytotaxa 230 (1): 47. 2015.*Viola enneasperma* L., Sp. Pl. 937. 1753.*Viola suffruticosa* L., Sp. Pl. 937. 1753. *Ionidium enneaspermum* (L.) Vent., Jard. Malm. Sub. t. 27. 1803. *Ionidium suffruticosum* (L.) Ging. in DC., Prodr. 1: 311. 1824; Hook.f. & Thoms. in Hook. f., Fl. Brit. India 1: 185. 1872; Dunn in Gamble, Fl. Pres. Madras 49(35). 1915.*Hybanthus enneaspermus* (L.) F.v. Muell., Fragm. Phyt. Austr. 10: 81. 1876; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 29. 2004.

Malayalam Name : Orithalthamara

Distribution : Sri Lanka, India, China, Madagascar, Africa and Tropical Australia

Annual herbs. Leaves simple, Alternate, subsessile, linear-lanceolate or elliptic-lanceolate. Flowers axillary, solitary; pedicel, slender. Sepals 5, subequal, lanceolate, acute, ciliate. Petals 5, pinkish, unequal; lower one, suborbicular,

clawed, other 4 smaller, elliptic or triangular-oblong. Stamens. Capsules, ovoid; seeds many, ovoid.

Flowering & Fruiting : July-November

Notes : It is a Medicinal plant.

Herbarium:Coll.No.202.PBK/KVS/ALT/PKD,13.04.2022.,Praveenkumar K.(Fl).

CXIV. VITACEAE

517.*Ampelocissus indica* (L.) Planch., Vigne Amer. Eur. 8: 375. 1884; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 101. 2004. *Vitis indica* L., Sp. Pl. 202. 1753; Lawson in Hook. f., Fl. Brit. India 1: 653. 1875.*Ampelocissus arnottiana* Planch. in A. & C.DC., Monogr. Phan. 5: 379. 1887; Gamble, Fl. Pres. Madras 231(165). 1918. (Plate 6 C).

Malayalam Name : Chemparavalli, Semparavalli

Distribution : Peninsular India and Sri Lanka

Scandent shrubs. Leaves simple, Alternate, broadly ovate, sometimes angled. Inflorescences dense racemes of umbels. Flowers reddish brown. Berries globose; seeds suborbicular in outline, mucronate at base, with a longitudinal ridge and a broad groove on either side on adaxial surface and an elliptic chalazal knot and very fine fissures radiating towards margin on abaxial surface.

Flowering & Fruiting : March-September

Notes : It is a Medicinal plant

518.*Causonis trifolia* (L.) Mabb. & J. Wen, Mabberley's Pl.-Book 110. 2017.*Vitis trifolia* L., Sp. Pl. 203. 1753. *Cayratia trifolia* (L.) Domin, Biblioth. Bot. 89: 370. 1927; E. Vajr., Fl. Palghat Dist. 124. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 102. 2004. *Vitis carnosa* (Lam.) Wall. ex Wight & Arn., Prodr. 127. 1834; Lawson in Hook. f., Fl. Brit. India 1: 654. 1875.*Cissus carnosa* Lam., Encycl. 1: 31. 1789.*Cayratia carnosa* (Lam.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 347. 1911; Gamble, Fl. Pres. Madras 237(169). 1918.

Malayalam Name : Amarchakkodi, Kattuperanda, Kadalmunthiri,

Distribution : Indo-Malesia, S. China, Australia and Western Pacific Islands

Glabrous tendril climbers. Leaves 3-foliolate; terminal leaflets ovate or elliptic. Cymes umbellate or corymbose, axillary. Petals 4, greenish-white, Disk white. 4-lobed. Stamens 4; filaments Ovary 2-celled; ovules 2 per cell. Berry depressed globose, dark purplish-black; seeds 1-4, pyriform, adaxial surface with a longitudinal ridge and a pit on either side.

Flowering & Fruiting : Throughout the year

Notes : It is a Medicinal plant

Herbarium: Coll. No.02.PBK/KVS/ALT/PKD,08.01.2020,Praveenkumar K. (Fl).

519.*Cayratia pedata* (Lam.) A. Juss. ex Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 346. 1911; Gamble, Fl. Pres. Madras 236(169). 1915; E. Vajr., Fl. Palghat Dist. 123. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 102. 2004.*Cissus pedata* Lam., Encycl. 1: 31. 1783.Vitis pedata (Lam.) Wall. ex Wight & Arn., Prodr. 128. 1834; Lawson in Hook. f., Fl. Brit. India 1: 661. 1875.*Vitis canarensis* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 123. 1851.Cayratia pedata (Lam.) A. Juss. ex Gagnep. var. glabra Gamble, Fl. Pres. Madras 236(169). 1918.

Malayalam Name : Corivalli, Odiyankurunnu, Tripadi

Distribution : Indo-Malesia

Climbing shrubs. Leaves pedately; leaflets ovate, acuminate, serrate, hispid. Cymes axillary, hispid; peduncle pubescent. Flowers greenish. Berry subglobose, 2-4 lobed, rusty tomentose; seeds 2-4, ellipsoid, faces rugose; endosperm crescent-shaped in cross section.

Flowering & Fruiting : June-July

Notes : It is a Medicinal plant

Herbarium:Coll.No.92.EPN/KVR/CTR/PKD, 07.02.2021., Praveenkumar K.(Fl).

520.*Cissus arnottiana* B.V. Shetty & P. Singh, Kew Bull. 44: 473. 1989; Sasidh., Fl. Parambikulam WLS 70. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 103. 2004.

Vitis pallida sensu Lawson in Hook. f., Fl. Brit. India 1: 647.1875,p.p., non Wight & Arn. 1834.*Cissus pallida* sensu Planch. in A. & C. DC., Monogr. Phan. 5: 477. 1887,p.p., non Salisb. 1796; Gamble, Fl. Pres. Madras 234(167). 1918.

Distribution : India and Sri Lanka

Shrubs; tendrils simple. Leaves simple, Alternate, broadly ovate. Cymes axillary, leaf opposed; puberulus; bracts ovate. Calyx truncate, Petals hooded, brown outside, white inside Stamens 4, disc prominent, 4-lobed. Ovary embedded, style stout.

Flowering & Fruiting : April-June

521.*Cissus heyneana* Steud., Nomencl. Bot. ed. 2, 1: 372. 1840; Gamble, Fl. Pres. Madras 234(167). 1918; Sasidh., Fl. Parambikulam WLS 71. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 103. 2004.*Vitis heyneana* sensu Wall. ex Wight & Arn., Prodr. 125. 1834; Lawson in Hook. f., Fl. Brit. India 1: 647.1875, non Roemer & Schultes (1819).

Malayalam Name : Kalnjarala

Distribution : India, Sri Lanka and Indo-China

Weak climbers. Leaves simple, ovate, acuminate, cordate at base, glabrous, margins distantly serrate; petiole. Cymes, axillary, thinly hairy; peduncle, dichotomous. Flowers greenish. Calyx tube obscurely 4-lobed. Petals oblong-ovate acute, hooded. Berry obovoid, white, smooth; seed 1, obovoid, smooth.

Flowering & Fruiting : April-June

Herbarium:Coll.No.69.EPN/KVR/CTR/PKD, 14.12.2020., Praveenkumar K.(Fl).

522.*Cissus latifolia* Lam. *Ampelocissus latifolia* (Roxb.) Planch., Vigne Aner. Europe 8: 374. 1884 & in A. & C. DC., Monogr. Phan. 5: 370. 1887; Gamble, Fl. Pres. Madras 230(165). 1918; E. Vajr., Fl. Palghat Dist. 122. 1990; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 101. 2004.*Vitis latifolia* Roxb., Fl. Ind. 1: 661. 1820; Lawson in Hook. f., Fl. Brit. India 1: 652. 1875.

Malayalam Name : Chembravalli, Karantavalli, Valiyapirappitikha

Distribution : South Asia to Thaliland

Scandent shrubs. Leaves simple, sometimes 3-5 lobed, glabrous. Inflorescences pyramidal-thyrsoid. Flowers reddish brown; pedicels puberulous. Berries globose, black when ripe, 2-4 seeded. Seeds elliptic-oblong in outline.

Flowering & Fruiting : May-June

Herbarium:Coll.No.139.ANK/TCK/MKD/PKD, 24.05.2021., Praveenkumar K.(Fl).

523.*Tetrastigma leucostaphylum* (Dennst.) Alston ex Mabb., Taxon 26: 539. 1977; Manilal, Fl. Silent Valley 60. 1988; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 105. 2004.*Cissus leucostaphyla* Dennst. Schluss. Hort. Malab. 17,19,33. 1818.*Tetrastigma muricatum* (Wall. ex Wight & Arn.) Gamble, Fl. Pres. Madras 229(164). 1918.*Tetrastigma lanceolarium* (Roxb.) Planch. in A. & C.DC., Monogr. Phan. 5: 423. 1887; Gamble, Fl. Pres. Madras 228(164). 1918; E. Vajr., Fl. Palghat Dist. 126. 1990.*Vitis muricata* Wall. ex Wight & Arn., Prodr. 128. 1834.*Vitis lanceolaria* sensu Lawson in Hook. f., Fl. Brit. India 1: 660. 1875,p.p., non Wall. 1831-32.

Malayalam Name : Seenkaikkodi

Distribution : Indo-Malesia

Woody scandent shrubs. Leaves pedately 5-foliolate, trifoliolate or simple, sometimes all three types found on same plant; leaflets oblong-lanceolate,. Flowers in short axillary cymes. Berry subglobose, creamy white; seeds oblong, transversely rugose.

Flowering & Fruiting : May-August.

Herbarium:Coll.No.159.TBK/TCK/MKD/PKD,24.05.2021,PraveenkumarK.(Fl).

CXV. ZINGIBERACEAE

524.*Hellenia speciosa* (Koenig) S.R. Dutta, Pleione 7: 228. 2013.*Banksea speciosa* Koenig in Retz., Obs. Bot. 3: 75. 1783.*Costus speciosus* (Koenig) J.E. Smith, Trans. Linn. Soc. London 1: 249. 1791; Baker in Hook. f., Fl. Brit. India 6: 249. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1490(1041). 1928; E. Vajr., Fl. Palghat

Dist. 498. 1990; Sasidh., Biodiv. Doc. Kerala-Fl. Pl. 481. 2004.*Cheilocostus speciosus* (Koenig) C.D. Specht, Trans. Linn. Soc. London 1: 249. 1791. **Costaceae** (APG).

Malayalam Name : Channa, Channakoova,

Distribution : Indo-Malesia

Herbs, rhizome tuberous. Leaves spirally arranged, oblong or oblanceolate-oblong. Spikes terminal, more or less globose. Corolla white; lobes elliptic-oblong, acuminate. Capsule bright red, dehiscing loculicidally; seeds black with fleshy white aril.

Flowering & Fruiting : July-October

Notes : It is a Medicinal plant. The variety *marginatus* with variegated leaves is grown as garden plant.

Herbarium:Coll.No.29.PKM/CVA/OTP/PKD,22.02.2020.,Praveenkumar K.(Fl).

525.*Curcuma aeruginosa* Roxb., Asiat. Res. 11: 335. 1810; Baker in Hook. f., Fl. Brit. India 6: 212.1890; M. Sabu, Zingiberaceae and Costaceae of South India 132. 2006.*Curcuma caesia* auct. non Roxb; Mangaly & M. Sabu, Rheedea 3: 147. 1993.*Curcuma malabarica* Velayu. *et al.*, J. Econ. Tax. Bot. 14: 189. 1990.

Malayalam Name : Karimanjal, Neelakua

Distribution : India and Myanmar

Rhizomatous herbs. Leafy stem; Leaves oblong-lanceolate, glabrous, purple or reddish-brown patch along the sides of the distal half of the mid rib. Inflorescence lateral; coma bracts, pink to violet. Flowers ; Corolla tube pink, lobes unequal; dorsal lobes concave; lateral lobes tip rounded, pink.

Flowering & Fruiting : April-May

Notes : It is a Medicinal plant

526.*Curcuma aurantiaca* Zijp, Recueil Trav. Bot. Néerl. 12: 345 1915. *Curcuma ecalcarata* Sivar. & Indu, Notes Roy. Bot. Gard. Edinb. 41: 321. 1983; Sasidh., Fl. Parambikulam WLS 343. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 481. 2004. (Plate 9 A).

Distribution : Southeast Asia

Herbs. Leafy stems. Leaves broadly ovate, acuminate pubescent. Inflorescens central; bright pink in those with sterile bracts and greenish-white in those with fertile bracts; fertile bracts broadly rounded, tip recurved, green or rose. Corolla tube lobes unequal; dorsal lobe oblong, concave, hooded and apiculate at tip. Epigynous glands two, cylindrical. Ovary pubescent, style long, filiform; stigma cup-like, hairy.

Flowering & Fruiting : August-November

527.*Curcuma longa* L., Sp. Pl. 2. 1753; Baker in Hook. f., Fl. Brit. India 6: 214. 1890; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1483(1036). 1928; Sasidh., Fl. Parambikulam WLS 343. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 482. 2004. (Plate 4 F).

Malayalam Name : Manjal

Distribution : Cultivated throughout the tropics

Rhizomatous herbs. Leafy shoot pseudostem. Leaves 4-6, distichous; lamina oblong-lanceolate, tapering at both ends, margins wavy. Inflorescence central. Flowers equal to the bracts; outer bracteoles ovate-oblong. Corolla tube white, glabrous; lobes unequal; dorsal lobe concave, white, hooded, hood hairy. Style long, filiform; stigma blipped.

Flowering & Fruiting : September-October

Notes : It is a Medicinal plant. *Curcuma longa* L. is the most widely cultivated species. About 60 cultivars are recognised, among these cultivars, Prabha, Prathibha, Ranga, Rasmi, Roma, Suganthan, Suguna, Suvarna, Sudharsana and Suroma are improved varieties. Wayanadan variety of turmeric is remarkable for their bright yellow colour of the rhizome.

528.*Zingiber officinale* Rosc., Trans. Linn. Soc. London 8: 348. 1807; Baker in Hook. f., Fl. Brit. India 6: 246. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1489(1040). 1928; Sasidh., Fl. Parambikulam WLS 346. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 484. 2004.

Malayalam Name : Andrakam, Chukku, Erukizhangu, Inchi

Distribution : Cultivated in Tropical countries

Rhizomatous herbs. Leafy stem. Leaves elliptic-oblong, acuminate. Inflorescence arises direct from the rhizome. Flowers few yellow with purplish spots. Labellum white, obovate. Staminal filament short, anther cells contiguous, connective produced into a beak. Style filiform; stigma subglobose.

Flowering & Fruiting : September-December

Notes : It is a Medicinal plant

Herbarium:Coll.No.148.ANK/TCK/MKD/PKD,22.07.2021,PraveenkumarK.(Fl)

Zingiber zerumbet (L.) J.E. Smith, Exot. Bot. 2: 105, t.112.1804; Baker in Hook. f., Fl. Brit. India 6: 247. 1892; C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1490(1040). 1928; Sasidh., Fl. Parambikulam WLS 347. 2002; Sasidh., Biodiv. Doc. Kerala- Fl. Pl. 485. 2004.*Amomum zerumbet* L., Sp. Pl. 1. 1753.

Malayalam Name : Kattinchi, Kattukolinchi, Narikarimbu

Distribution **:** India, Sri Lanka and Malesia

Rhizomatous herbs; leafy stem. Leaves oblong or oblong-lanceolate. Flowers white. Calyx tube 3-lobed. Corolla dorsal lobe ovate-acuminate. Labellum 3-lobed, mid-lobe suborbicular, lateral lobes ovate, creamy white. Capsule oblong; seeds globose.

Flowering & Fruiting : July-November

Notes : It is a Medicinal plant.

Herbarium: Coll.No. 199. EPN/KVR/CTR/PKD, 03.04.2022., Praveenkumar K.(Fl).

5.1. 3. Sacred groves in Alathur taluk

The investigation was conducted in seven sacred groves of Alathur taluk which incorporates Thiruvadi kunnath Tharavadu, Koramparambu Sarpakkavu, Parakkattukavu Bhagavathi Kshethram, Peringottukurissi Nagakshethram, Nottathe Tharavadu Nagakavu, Tholanur Valiyathodi Kavu and Kariyamkodu

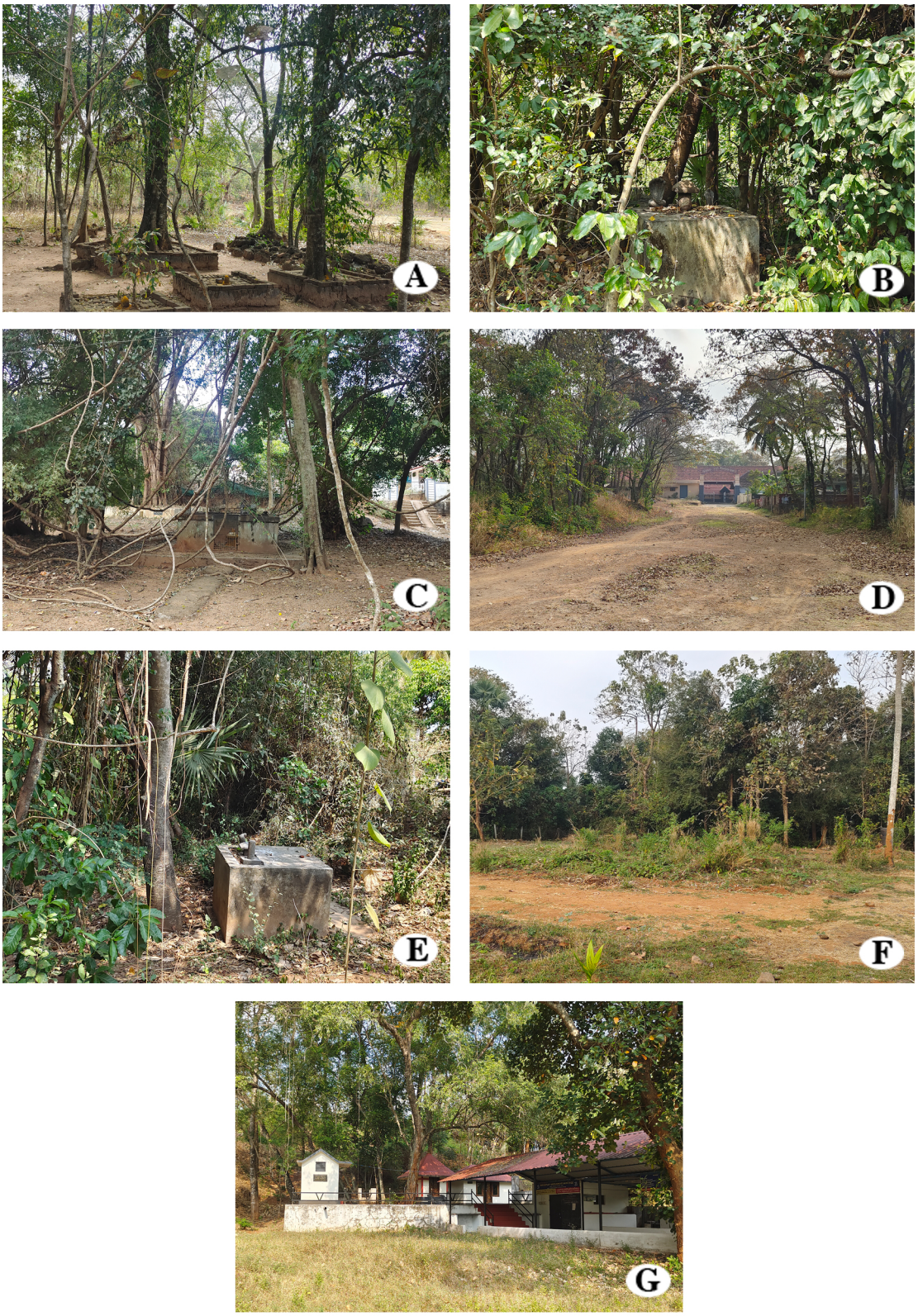

Plate 18. Sacred groves in Alathur taluk

A. *Kariyamkodu Vatukasamudayam* **B.** *Koramparambu Sarpakkavu*
C. *Nottathe Tharavadu Nagakavu* **D.** *Parakkattukavu Bhagavathi Kshethram*
E. *Peringottukurussy Nagakshethram* **F.** *Thiruvadi Kunnath Tharavadu*
G. *Tholanur valiyaathody Kavu*

Vatukasamudayam (Plate 8). Parakkattukavu Bhagavathi Kshethram is under Malabar devaswom board all others are private properties. Dieties includes Nagam, Bhuvaneswary, Ayyappan, Bhagavathi, Sasthavu and Vettekkorumakan. In which Parakkattukavu Bhagavathi Kshethram sacred grove is the largest one having about 10.12 ha and Kariyamkodu Vatukasamudayam is the smallest covering only 0.03 ha. All of them are well protected because of the presence of diety.

Complete of 398 plant species are revealed from seven sacred groves of Alathur taluk. List includes 136 herbs (36.54%), 62 climbers (20.30%), 71 shrubs (15.73%) and 129 trees(27.41%). *Cassia fistula* L., *Pothos scandens* L. are reported from all the above sacred groves.

Jasminum coarctatum Roxb., Tabernaemontana alternifolia L. , *Helicteres isora L.* are found in three sacred groves. *Borassus flabellifer* L., *Caryota urens* L. and *Cocos nucifera* L. are the three common palms found in the groves.

Glycosmis pentaphylla (Retz.) DC., *Cassia fistula* L., *Aphanamixis polystachya* (Wall.) R. Parker, *Clerodendrum infortunatum* L., *Briedelia retusa* (L.) A. Juss., *Asparagus racemosus* Willd., are the native plant species found in four sacred groves.Invasive plants like *Lantana camara* L., *Chromolaena odorata* (L.) King & H. Rob., *Mikania micrantha* Kunth, *Centrosema molle* Benth. etc. are also present in these groves.

Members from 81 plant families documented from sacred groves of Alathur taluk. Fabaceae is the dominant plant family. Euphorbiaceae and Asteraceae are in second and third position respectively. Greatest species diversity documented from Parakkattukavu Bhagavathi Kshethram. Least species diversity observed in Kariyamkodu Vatukasamudayam, Kottayi. Number of plant species, Genus, Family..etc. recorded in table 6 with a special focus on Endemic plants of sacred groves of Alathur taluk.

Table. 6. Species composition in seven sacred groves of Alathur Taluk

Sl. No.	Sacred groves	Total No. Family	Total No. of Genera	Total No. of Species
1	Kariyamkodu Vatukasamudayam	18	29	42
2	Koramparambu Sarpakkavu	28	22	35
3	Nagakshethram Peringottukurussy	21	27	39
4	Nottathe Tharavadu Nagakavu	13	18	25
5	Parakkattu Bhagavathi Kshethram	61	82	176
6	Thiruvadikkunnath, Tharavadu	22	18	28
7	Tholanur Valiyathodi kavu	21	26	53

Almost all plants reported from sacred groves of Alathur taluk are medicinally important. All these plants are used in various systems like Folk, Ayurveda, Homeopathy, Unani, etc.

Endemic plants such as *Memecylon talbotianum* Brandis, *Tabernaemontana alternifolia* L., *Bridelia stipularis* (L.) Blume, *Artocarpus hirsutus* Lam., *Holigarna arnottiana* Hook.f., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Piper nigrum* L. and *Tetrapilus dioicus* (Roxb.) L.A.S. Johnson.. are reported from the groves of Alathur taluk.

398 angiosperm plant species reported from the above mentioned sacred groves belongs to 158 genera and 78 families. one endangered, five vulnerable, two near threatened and one least concern species. *Saraca asoca* (Roxb.) de Wilde (Endangered), *Artocarpus hirsutus* Lam., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Gloriosa superba* L., *Aphanamixis polystachya* (Wall.) R. Parker and *Smilax zeylanica* L. (Vulnerable), *Tinospora sinensis* (Lour.) Merr. and *Garcinia gummi-gutta* (L.) Roxb. (Near threatened) and *Piper nigrum* (Least concern species) were accounted for from sacred groves of Alathur taluk.

Parakkattukavu Bhagavathi Kshethram, kavassery needs better protective methods like compound wall. Parakkattu kavu temple is under Malabar

devaswom board. Bio fence or mud fence (Mannukayyala) is better for this place. *Mikania micrantha* Kunth and *Chromolaena odorata* (L.) King & Robins are the common invasive weeds observed in all groves.

Local peoples are permitted for worship in four groves hence they are protected by the involvement of local community. Nottathe tharavattu kavu is unprotected and road fragmenting the grove.

5.1.4. Sacred groves in Chittur taluk

The investigation was directed in seven sacred groves of Chittur taluk. Namely Nagakanikagostam Nagakavu, Kizhakkemundarathu Nagakavu, Ekalavyasramam Karuppaswamikshethram, Pilappully Nagakavu, Punnakkodu Nagakshethram, Ethanur Pandalangatt Nagakavu and Thuppala Tharavadu Nagakavu (Plate 19). Dieties are Nagam, Nagarajavu, Bhadrakali, Durga devi, Shivaparvathi and Karuppa swami. Here Karuppaswami is quite different diety which is different from other localities. Ekalavyasramam Karuppaswamikshethram is the largest one having 1.92 ha in area and Thuppala Tharavadu Nagakavu is the smallest one covering an area of 0.04 ha.

During this investigation 94 plant species are documented from sacred groves of chittur taluk, which incorporates economically significant, food and red listed plants and medicinally important plants. The listed 94 species coming under 76 genera and 48 families. Asteraceae was the dominant followed by fabaceae and Euphorbiaceae. Ethanur Pandalalangatt is the largest one having 72 species and Punnakkodu Nagakavu is the smallest one only having 11species.

Antiaris toxicaria Lesch., *Alstonia scholaris* (L.) R. Br., *Macaranga peltata* (Roxb.) Muell.-Arg., *Aglaia elaeagnoidea* (A. Juss.) Benth., *Albizia lebbeck (L.) Benth., Holigarna arnottiana* Hook.f.,etc. are the major tree species documented from these sacred groves of Chittur taluk.

A gymnosperm coming under family Gnetaceae, *Gnetum edule* (Willd.) Blume reported from Ethanur pandalangatt kavu. Which is a climber in nature. *Chionanthus mala-elengi* (Dennst.) P. S. Green, *Hydnocarpus pentandra* (Buch.-

Ham.) Oken, *Artocarpus hirsutus* Lam., *Dipteracanthus prostratus* (Poir.) Nees, *Holigarna arnottiana* Hook. f., *Memecylon talbotianum* Brandis, *Tabernaemontana alternifolia* L., *Bridelia stipularis* (L.) Blume, *Mussaenda frondosa* L., *Olea dioica* Roxb. and *Memecylon talbotianum* Brandis are the 11 endemic plants documented from the sacred groves of Chittur taluk. All over species composition described in table 7.

Ichnocarpus frutescens (L.) R.Br., *Anamirta cocculus* (L.) Wight & Arn., *Tetrastigma leucostaphylum* (Dennst.) Alston ex Mabb., *Cayratia pedata* (Lam.) A. Juss. ex Gagnep., *Sarcostigma kleinii* Wight & Arn., *Cissus latifolia* Lam.,etc. are the climbers documented from these groves.

Table. 7. Species composition in seven sacred groves of Chittur taluk

Sl. No.	Sacred groves	Total No. of Family	Total No. of Genera	Total No. of Species
1	Ekalavyasramam Karuppaswamikshethram	31	42	51
2	Ethanur Pandalangat Nagakavu	34	46	72
3	Kizhakkemundarathu Nagakavu	26	34	39
4	Nagakanikagostam Nagakavu	12	19	23
5	Pilappully Nagakavu	8	11	19
6	Punnakkodu Nagakshethram	6	8	11
7	Thuppala Tharavadu Nagakavu	22	24	28

87 plants (92.55%) documented from the above mentioned seven sacred groves of Chittur taluk are medicinally significant and used in different systems like Ayurveda, Folk, Sidha, Unani, Homeopathy. etc. *Strychnos nux-vomica* L., *Couroupita guianensis* Aubl., *Phyllanthus emblica* L., *Azadirachta indica* A. Juss., *Ixora coccinea* L., are the significant medicinal plants reported from the groves.

Incase of plant diversity, 94 plants are documented including one climbing gymnosperm *Gnetum edule* (Willd.) Blume. 31 trees (32.97%) , 17 shrubs



Plate 19. Sacred groves in Chittur taluk

A. *Ekalavyasramam Karuppaswami Kshethram* **B.** *Ethanur Pandalangat Nagakavu*
C. *Kizhakkemundarathu Nagakavu* **D.** *Nagakanikagostam Nagakavu*
E. *Pilappully Nagakavu* **F.** *Punnakkodu Nagakshethram*
G. *Thuppala Tharavadu Nagakavu*

(18.08%), 26 climbers (27.65%) and 20 herbs (21.27%). Trees are most abundant in these groves followed by climbers.

Alstonia scholaris (L.) R. Br., *Ficus benghalensis* L., *Pothos scandens* L., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Caryota urens* L., *Holigarna arnottiana* Hook. f. are present in all sacred groves. Documented *Mimusops elengi* L. and *Borassus flabellifer* L from 6 groves.

Out of these 94 plant species *Mangifera indica* L., *Grewia tiliifolia* Vahl, *Aphanamixis polystachya* (Wall.) R. Parker, *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Piper nigrum* L., *Artocarpus hirsutus* Lam., *Olea dioica* Roxb., *Artocarpus hirsutus* Lam., *Tectona grandis* L. etc. are economically valuble members documented from these groves.

The three Endangered species (*Chionanthus mala-elengi* (Dennst.) P. S. Green, *Santalum album* L. and *Saraca asoca* (Roxb.) de Wilde), five Vulnerable species (*Aphanamixis polystachya* (Wall.) R. Parker, *Artocarpus hirsutus* Lam., *Gloriosa superba* L., *Hydnocarpus pentandra* (Buch.-Ham.) Oken and *Smilax zeylanica* L.), three Near threatened species (*Garcinia gummi-gutta* (L.) Roxb., *Piper longum* L. and *Tinospora sinensis* (Lour.) Merr.) and one Least concern species (*Piper nigrum* L.) were reported from seven sacred groves of Chittur taluk.

Invasive plants like *Mikania micrantha* Kunth., *Chromolaena odorata* (L.) King & H. Rob., *Lantana camara* L., *Mimosa pudica* L.,etc. are flourished well on these groves. Which will adversely affect the native flora.

Most of the groves in Chittur taluk located in dry areas. Ekalavyasramam Karuppaswami Kshethram is the largest one covering an area of 1.92 ha followed by Kizhakkemundarathu Nagakavu (0.20 ha) and Ethanur Pandalangatt Kavu (0.10 ha). The same grove is permits worships to the local people and which is characterised by the largest ficus tree (*Ficus benghalensis* L.). Many birds and smaller animals depending these trees for food and shelter. Protection of these groves must need immediate attention. Ethanur pandalangattu kavu, Thuppala tharavattu kavu, Punnakkottu kavu,

Kizhakkemundarath kavu, Nagakanighoshtam are well protected all others are unprotected. Pollution rate increases due to increases pilgrims in Ekalavyasramam Karuppaswami Kshethram while the management try to implement new methods.

5.1. 5. Sacred groves in Palakkad taluk

The investigation was conducted in eight sacred groves of Palakkad taluk. The list includes Kannadi Variyam Pambumkavu, Kariyattin Sarpakkavu, Kizhakkekkara Tharavadu Nagakavu, Pattiparambu Tharavattukavu, Cherukadu Sarpakkavu, Cholayil thazhathu veluthankavu, Puthanpurakkal Tharavadu Veluthankavu and Thiruvalathur Ayyappankavu (Plate 20). Common dieties are Nagam, Bhagavathi, Chithrakoodam, Gurunathan and Kuttichathan. Thiruvalathur Ayyppankavu is the largest one having an area of 0.10 ha. controlled by Malabar devasom board.

Endemic plants like *Bridelia stipularis* (L.) Blume, *Holigarna arnottiana* Hook.f., *Canthium rheedei* DC., *Memecylon randerianum* S.M. Almeida & M.R. Almeida , *Artocarpus hirsutus* Lam., *Hopea ponga* (Dennst.) Mabb., *Olea dioica* Roxb., *Pandanus kaida* Kurz, *Sida rhomboidea* Roxb. ex Fleming, *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Memecylon talbotianum* Brandis, *Mussaenda frondosa* L., *Osbeckia muralis.* Naud., *Torenia bicolor* Dalz. and *Tabernaemontana alternifolia* L. are reported rom here besides redlisted plant species by IUCN.

The present investigation was conducted in eight sacred groves of Palakkd taluk. Reported 72 species falling beneath 51 genera and 48 families. 22 trees (30.55%), 13 shrubs (18.05%), 25 climbers (34.73%) and 12 herbs (16.67%). Comparatevely less species diversity with respect to other groves of remaining taluks. Rubiaceae is the dominant one followed by fabaceae and verbenaceae.

In eight sacred groves of Palakkad taluk one plant species *Saraca asoca* (Roxb.) de Wilde was considered as Endangered, six species *Aphanamixis polystachya* (Wall.) R. Parker, *Artocarpus hirsutus* Lam., *Gloriosa superba* L., *Hopea ponga* (Dennst.) Mabb., *Hydnocarpus pentandra* (Buch.-Ham.) Oken and *Smilax zeylanica*



Plate 20. Sacred groves in Palakkad taluk

A. *Cherukadu Sarpakkavu* **B.** *Cholayil thazhathu Veluthankavu*
C. *Kannadi Variyam Pambumkavu* **D.** *Kariyattin Sarpakkavu*
E. *Kizhakkekkara Tharavadu Nagakavu* **F.** *Pattiparambu Tharavattukavu*
G. *Puthanpurakkal Tharavadu Veluthankavu* **H.** *Thiruvalathur Ayyappan Kavu*

L. were Vulnerable, one species *Garcinia gummi-gutta* (L.) Roxb. was near threatened and one species *Piper nigrum* L. was Least concern categories.

Among these groves Thiruvalathur Ayyappan kavu shows huge number of species (51), genus (38) and family (28). Most minimal number of species is reported from Kannadi Variyam Pambumkavu of Kannadi. Absolute number of Family, Genus and Species in various sacred groves of Palakkad taluk are described in table 8.

Sacred groves of Palakkad taluk contain huge number of economically significant, redlisted and medicinal plants. Complete of 72 species, 69 (95.83%) plant species are medicinally important. *Phyllanthus urinaria* L., *Clitoria ternatea* L., *Asparagus racemosus*, Willd., etc. are used in different ractices of medicines such as Folk, Ayurveda, Sidha, Unani etc.

Table. 8. Species composition in 8 sacred groves of Palakkad taluk

Sl. No.	Name	Total No. of Family	Total No. of Genera	Total No. of Species
1	Cherukadu Sarpakkavu	18	26	32
2	Cholayil thazhathu veluthankavu	21	31	37
3	Kannadi Variyam Pambumkavu	9	16	24
4	Kariyattin Sarpakkavu	12	14	18
5	Kizhakkekkara Tharavadu Nagakavu	17	16	23
6	Pattiparambu Tharavattukavu	11	16	22
7	Puthanpurakkal Tharavadu Veluthankavu	13	19	24
8	Thiruvalathur Ayyappankavu	28	38	51

Only Cholayil thazhathu veluthankavu and Kariyattin sarpakkavu are well protected with compound walls. In majority of groves the diety is well

protected but the surrounding flora remains unprotected. External disturbance is maximum in unprotected groves. Some groves fragmented by roads and electric lines. A number of groves are situated near rubber plantations which is a main cause of distruction of natural flora ie. Agroforestry related disturbance. Unproted groves polluted with solid wastes like plastic. This has a negative impact on biodiversity. Plastics are harmful to plant growth and do not biodegrade.

5.1. 6. Sacred groves in Mannarkkad taluk

Investigation was done in 14 sacred groves of Mannarkkad taluk. They are Kothelamuthappan Kavu, Pothirathu Tharavattukavu, Kallingal Tharavattukavu, Athippattamana Nagakanyaka Kshethram, Karippaman Tharavattukavu, Panankurussy Shivashyleswara Kshethram, Karippadathu Tharavattukavu, Azhchathu Tharavattukavu, Ambalathu Sarpakavu, Musaliyathu Melengadi Tharavattukavu, Erattukoothan Tharavattukavu, Kavuvattom Pothirath Kavu, Thiruthinmel Bhagavathi Kshethram and Kundupalliyalil Sarpakavu (Plate 21 & 22). Observed dieties are Nagam, Nagakanyaka, Nagarajavu, Nagayakshi, Brahmarakshassu, Mahavishnu, Bhuvaneswary and Moothaar. Here Moothar is a different concept. Athippattamana Nagakanya Kshethram is the largest one covering 0.20 ha.

A sum of 143 plant species are documented from 14 sacred groves of Mannarkkad taluk. Contains 129 genera and 67 families. Fabaceae is the largest plant family observed from these groves followed by Asteraceae. Total flora includes 52 trees (36.36%), 23 Shrubs (12.58%), 39 Climbers (27.27%) and 29 Herbs (20.27%). Athippattamana Nagakanya Kshethram shows huge number of species having 91 species, 80 geneus and 72 families, followed by Ambalath Sarpakkavu. Lowest species composition reported from Kundupalliyalil Sarpakavu. (Table. 9).

11 plants reported from these groves are coming under endemic plants. *Vateria indica* L., *Chionanthus mala-elengi* (Dennst.) P. S. Green, *Artocarpus hirsutus* Lam., *Ixora lanceolaria* Colebr. in Roxb., etc. are the endemic plant species noticed.



Plate 21. Sacred groves in Mannarkkad taluk
A. *Ambalathu Sarpakavu* **B.** *Athippattamana Nagakanya Kshethram*
C. *Azhchathu Tharavattukavu* **D.** *Erattukoothan Tharavattukavu*
E. *Kallingal Tharavattukavu* **F.** *Karippadathu Tharavattukavu*
G. *Karippuman Tharavattukavu*



Plate 22. Sacred groves in Mannarkkad taluk

A. *Kothelamuthappan Kavu* **B.** *Kundupalliyalil Sarpakavu*
C. *Musaliyathu Melengadi Tharavattukavu* **D.** *Panankurussy Shivashyleswara Kshethram*
E. *Pothirathu Tharavattukavu* **F.** *Pothirath Kavu Kavuvattam*
G. *Thiruthinmel Bhagavathi Kshethram*

Nine among these are reported from Athippattamana Nagakanya Kshethram of Thachanattukara villege.

IUCN red listed plants consists of one Critically endangered (*Vateria indica* L.), one Endangered (*Chionanthus mala-elengi* (Dennst.) P. S. Green), three Vulnerable (*Artocarpus hirsutus* Lam., *Hydnocarpus pentandra* (Buch.-Ham.) Oken and *Pseudarthria viscida* (L.) Wight & Arn.), one Near threatened (*Garcinia gummi-gutta* (L.) Roxb. and one Least concern (*Piper nigrum* L.) categories.

Table. 9. Species composition in 14 sacred groves of Mannarkkad taluk

Sl. No.	Name	Total No. of Family	Total No. of Genera	Total No. of Species
1	Ambalathu Sarpakavu	29	37	49
2	Athippattamana Nagakanyaka Kshethram	59	72	96
3	Azhchathu Tharavattukavu	26	33	42
4	Erattukoothan Tharavattukavu	22	35	43
5	Kallingal Tharavattukavu	24	36	49
6	Karippadathu Tharavattukavu	18	24	31
7	Karippuman Tharavattukavu	22	27	32
8	Kavuvattam Pothirathu Kavu	18	36	47
9	Kothelamuthappan Kavu	7	16	23
10	Kundupalliyalil Sarpakavu	31	48	58
11	Musaliyathu Melengadi Tharavattukavu	28	34	41
12	Panankurussy Shivashyleswara Kshethram	21	28	36
13	Pothirathu Tharavattukavu	25	32	42
14	Thiruthummel Bhagavathi Kshethram	33	42	59

All groves except Kallingal sarpakkavu are well protected. No compound walls present in Kallingal. The festival "Thypooyam" is celebrating instead of Naga festival in the sacred grove of Athipattamana, when compare to other

scared groves. Local people are allowed to worship in majority of groves.While other activities like photography and collection are strictly prohibited.

Invasive species such as *Chromolaena odorata* (L.) King & H. Rob., and *Mikania micrantha* Kunth are documented from all groves. *Mimosa pudica* L., *Centrosema molle* Benth., *Lantana camara* L., etc. are the plants reported under exotic category from here.

Cassia fistula L., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Bombax ceiba* L., *Streblus asper* Lour., *Chassalia curviflora* (Wall. ex Kurz) Thwaites, *Holigarna arnottiana* Hook.f., *Pothos scandens* L., *Piper nigrum* L. *etc* are the native plants observed from these groves. Gymnosperm Cycas circinalis L. was noted from Athippattamana Nagakanya Kshethram.

5.1. 7. Sacred groves in Ottapalam taluk

The study was performed in 14 sacred groves of Ottapalam taluk. The list includes Kunnathu Tharavattukavu, Parappur Tharavattukavu, Pathirakunnathu Mana, Madathody Nagakavu, Katambazhipuram Veluthankavu, Pacheerikkavu, Chingath Sarpakavu, Poovakkottil Kavu, Vengalil Kavu, Kandayilkavu, Thavalakkottil Kavu, Azhakappathukavu, Thekkekara Tharavattukavu and Pullapallimanakavu (Plate 23 & 24). Naga, Anjanamaninagam, Ananthamaninagam, Karinagam, Maninagam and Nagarajavu are the dieties. Pathirakunnathu Mana is the largest one covering 1.62 ha of land.

A total of 112 plant species documented from the 14 sacred groves under 93 genera and 82 families. Euphorbiaceae is the dominant family followed by fabaceae. Most extreme number of plant species recorded from Pathirakunnath Mana with 79 species, 62 genera and 49 families. Comparatively least number of species composition reported from Thavalakkottil kavu. Total number of Species, Genus and Families in different sacred groves of Ottapalam taluk are listed in table. 10.

14 herbs (12.5%), 32 climbers (28.57%), 22 shrubs (19.64%) and 44 trees (39.28%) were reported from these groves. Out of these 112 plants are medicinally



Plate 23. Sacred groves in Ottapalam taluk
A. *Azhakappathukavu* **B.** *Chingath Sarpakavu*
C. *Kandayil Kavu* **D.** *Kunnathu Tharavattukavu*
E. *Madathody Nagakavu* **F.** *Pacheerikkavu*
G. *Parappur Tharavattukavu*



Plate 24. Sacred groves in Ottapalam taluk
A. *Pathirakunnathu Mana* **B.** *Poovakkottil Kavu*
C. *Pullapallimana Kavu* **D.** *Thavalakkottil Kavu*
E. *Thekkekara Tharavattukavu* **F.** *Veluthankavu Katambazhippuram* **G.** *Vengalil Kavu*

significant, *Ocimum tenuiiflorum* L., *Phyllanthus urinaria* L., *Boerhavia diffusa* L., *Naravelia zeylanica* (L.), *Cardiospermum halicacabum* L., *Phyllanthus amarus* Schum. & Thonn, *Hemidesmus indicus* (L) R.Br., DC.,etc. are used in various systems of medicine.

A gymnosperm *Cycas circinalis* L. documented from Pathirakkunnathu Mana sacred grove. *Cassia fistula* L., *Calycopteris floribunda* Lam., *Butea monosperma* (Lam.) Taub., *Gloriosa superba* L., *Putranjiva roxburghii* Wall., *etc*. are the native plant species well protected in the sacred groves Ottapalam taluk.

Table. 10. Species composition in 14 sacred groves of Ottapalam taluk

Sl. No.	Name	Total No. of Family	Total No. of Genera	Total No. of Species
1	Azhakappathukavu	12	23	36
2	Chingath Sarpakavu	22	38	46
3	Kandayilkavu	18	22	34
4	Kunnathu Tharavattukavu	12	18	29
5	Madathody Nagakavu	39	48	57
6	Pacheerikkavu	33	47	52
7	Parappur Tharavattukavu	21	36	42
8	Pathirakunnathu Mana	69	96	112
9	Poovakkottil Kavu	9	14	19
10	Pullapallimanakavu	25	34	48
11	Thavalakkottil Kavu	11	19	27
12	Thekkekara Tharavattukavu	21	29	37
13	Veluthankavu	26	39	48
14	Vengalil Kavu	23	29	37

Investigation was conducted on 14 sacred groves in Ottapalam taluk, and 112 flowering plants were found. Two Endangered species (*Saraca asoca* (Roxb.) de Wilde *Santalum album* L. and), seven Vulnerable species (*Artocarpus hirsutus* Lam., *Aphanamixis polystachya* (Wall.) R. Parker, ., *Gloriosa superba* L., *Dalbergia latifolia* Roxb., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Smilax zeylanica* L. and

Pseudarthria viscida (L.) Wight & Arn.), five Near threatened species (*Magnolia champaca* (L.) Baill. ex Pierre, *Amorphophallus paeoniifolius* (Dennst.), *Piper longum* L., *Tinospora sinensis* (Lour.) Merr.and *Terminalia cuneata* Roth) one Least concern species *Piper nigrum* L.and one Data Deficient species *Corypha umbraculifera* L.were also recorded from Ottapalam Taluk's sacred groves.

13 endemic plants from 14 sacred groves in this study were identified from Ottapalam taluk *viz*. *Bridelia stipularis* (L.) Blume, *Artocarpus hirsutus* Lam., *Dendrophthoe falcata* (L. f.) Ettingsh., *Canthium rheedei* DC., *Holigarna arnottiana* Hook.f., *Dipteracanthus prostratus* (Poir.) Nees, *Memecylon talbotianum* Brandis, *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Naregamia alata* Wight & Arn., *Mussaenda frondosa* L., *Tabernaemontana alternifolia* L. , *Terminalia paniculata* Roth. and *Tetrapilus dioicus (*Roxb.) L.A.S. Johnson.

Pathirakunnath Mana, Chingath sarpakkavu are well protected with compound walls. Local people can visit this grove throughout the year. No compound walls observed in all other groves.

5.1. 8. Sacred groves n Pattambi taluk

The investigation was conducted in 21 sacred gorves of Pattambi taluk. They are Perumarathinkavu, Thozhukkattukizhakkekara Tharavattukavu, Aachath Kavu Vavanoor, Mandakathinkal Kudumbakavu, Shrivalsamkavu, Kundinvadakkethil Kavu, Meluveettil Kavu, Aakkaparambil Sree Bhagavathi Kshethram, Parathekkattil Tharavattukavu, Poolakkal Kavu, Pullanikkulangara Kutumbakavu, Sreedharanchumarath Mana, Cholakkavu Shivakshethram, Pallipuram Pampinkavu, Sree Hariharakunnu Kavu, Punnara Shiva Kshethram, Sree Durgadevi Kshethram, Charakumalayil Tharavattukavu, Charakumalayil Kavu and Govindhapuram Vishnu Kshethram (Plate 25,26&27). Observed dieties are Maninagam, Anjanamaninagam, Nagarajavu, Nagayakshi, Karinagam, chithrakoodam and Nagakanyaka. Cholakkavu Sivakshethram is the largest one (0.80 ha) followed by Punnara Shiva Kshethram. Cholakkavu Sivakshethram owned by Malabar devaswom board. Sree Hariharakunnu



Plate 25. Sacred groves in Pattambi taluk

A. *Aachath kavu Vavanoor* **B.** *Aakkaparambil Sree Bhagavathi Kshethram*
C. *Charakumalayil Kavu* **D.** *Charakumalayil Tharavattukavu*
E. *Cholakkavu Shivakshethram* **F.** *Govindhapuram Vishnu Kshethram*
G. *Kundinvadakkethil Kavu* **H.** *Mandakathinkal Kudumbakavu*



Plate 26. Sacred groves in Pattambi taluk

A. *Meluveettil Kavu* **B.** *Pallipuram Pampinkavu*
C. *Parathekkattil Tharavattukavu* **D.** *Perumarathinkavu*
E. *Poolakkal Kavu* **F.** *Pullanikkulangara Kutumbakavu*
G. *Punnara Shiva Kshethram* **H.** *Shrivalsam Kavu*



Plate 27. Sacred groves in Pattambi taluk

A. *Sree Durgadevi Kshethram* **B.** *Sree Hariharakunnu Kavu*

C. *Sreedharanchumarath Mana* **D.** *Thozhukkattukizhakkekara Tharavattukavu*

Kavu, Punnara Shiva Kshethram and Govindhapuram Vishnu Kshethram are ruled by local trusts.

153 plant species reported from 21 sacred groves of Pattambi taluk belonging to 134 genera and 68 families. List includes 60 trees (39.21%), 32 shrubs (20.91%), 32 climbers (20.91%) and 29 herbs (18.95%). Out of these 149 plants are used in various branches of medicine. Total numbers of plant species in different sacred groves of Pattambi taluk are listed in the table. 11.

Table. 11. Species composition in 20 sacred groves of Pattambi taluk

Sl. No.	Name	Total No. of Family	Total No. of Genera	Total No. of Species
1	Aakkaparambil Sree Bhagavathi Kshethram	11	19	31
2	Achath kavu Vavanoor	28	42	57
3	Charakumalayil Tharavattukavu	26	33	49
4	Charakumalayil Kavu	12	19	21
5	Cholakkavu Shivakshethram	69	83	99
6	Govindhapuram Vishnu Kshethram	18	21	29
7	Kundinvadakkethil Kavu	52	63	86
8	Mandakathinkal Kudumbakavu	26	43	59
9	Meluveettil Kavu	12	18	29
10	Pallipuram Pampinkavu	14	21	29
11	Parathakkattil Tharavattukavu	10	18	21
12	Perumarathinkavu	12	18	26
13	Poolakkal kavu	33	46	57
14	Pullanikkulangara Kutumbakavu	38	42	58
15	Punnara Shiva Kshethram	55	68	73
16	Shrivalsamkavu	32	48	54
17	Sree Durgadevi Kshethram	13	22	29
18	Sree Hariharakunnu Kavu	48	56	71
19	Sreedharanchumarath Mana	58	76	98
20	Thozhukkattukizhakkekara Tharavattukavu	29	38	59

A sum of 153 species are documented from 20 sacred groves of Pattambi taluk. Maximum number of species reported from Cholakkavu Sivakshethram followed by Hariharakkunnu temple and Govindhapuram Vishnu Kshethram. Most minimal number of species composition noted from Charakumalayil Kavu.

Bridelia stipularis (L.) Blume, *Artocarpus hirsutus* Lam., *Dendrophthoe falcata* (L. f.) Ettingsh., *Hydnocarpus pentandra* (Buch.-Ham.) Oken, *Holigarna arnottiana* Hook.f., *Mussaenda frondosa* L., *Tabernaemontana alternifolia* L. and *Tetrapilus dioicus (*Roxb.) L.A.S. Johnson. are documented as endemic plants from above mentioned 20 sacred groves of Pattambi taluk.

Economically significant plants such as *Briedelia retusa* (L.) A. Juss., *Bombax ceiba* L., *Artocarpus heterophyllus* Lam., *Anacardium occidentale* L., *Piper nigrum* L., *Artocarpus hirsutus* Lam., *Mangifera indica* L., and *Zingiber officinale* Roscoe etc. are documented from these groves.

Among the plant species included by IUCN red lists are three Near threatened species (*Piper longum* L. *Tinospora sinensis* (Lour.) Merr. and *Amorphophallus paeoniifolius* (Dennst.)) one Least concern species (*Piper nigrum* L.) and four Vulnerable species (*Gloriosa superba* L., *Artocarpus hirsutus* Lam., *Smilax zeylanica* L. and *Hydnocarpus pentandra* (Buch.-Ham.) Oken).

Hariharakunnu temple and Cholakavu Sivakshethram are well protected with compound walls. Majority of the groves allow local people for worship to the diety.

527 angiosperms and 2 gymnospems (*Gnetum edule* (Willd.) Blume and *Cycas circinalis* L.) are documented from 70 sacred groves of Palakkad district. Well maintained sacred groves are Athippatta Mana (Thachanattukara, Mannarkkad taluk), Pathirakunnath Mana (Chalavara, Ottapalam taluk), Ethanur Pandalangatt Kavu (Koduvayur, Chittur), Parakkattukavu Bhagavathi Kshethram (Kavassery, Alathur) Thiruvalathur Ayyappan Kavu (Kodumbu, Palakkad) and Cholakkavu Sivakshetram (Pattambi taluk).The 70 sacred groves

of this district is protected mainly on the basis of diety worship and religious backgrounds. These sacred groves of Palakkad district needs an immediate attention for the conservation. Most of the groves are under private property and there is a chance to convert groves for other purposes.

5.2. Ecological significance of sacred groves

The present investigation was done on 70 sacred groves in 32 villages and six taluks of Palakkad district. The groves shows difference in vegetation moving from west to east of the district.

Sacred groves are significant *in situ* conservation sites and they are ecologically important. Sacred groves are act as biodiversity hotspots. The groves promote the growth of plants in their natural habitat without any disturbance. Both aquatic and terrestrial ecosystems are documented inside the groves.

Majority of the groves are associated with any kind of water bodies like river, pond or wells and hence promotes the associated flora and fauna. The groves enhances water holding capacity of water as well as absorption and helps to rise ground water level. Richness of flora and fauna flourishes food web well.

A number of various organisms are present in the groves, includes insects, birds, reptiles, fishes, rodents, aquatic organisms and mammals. All these organisms depends on the flora inside the groves for their survival. All seasonal and periodical events associated with the flora have an influence on biodiversity. These organisms and their connections to the biotic, abiotic environment and helps to stabilize the ecosystem.

Most of the organisms are noted depending on flowering and fruiting seasons of the flora whereas some others are permanently seen associated with the flora. The groves are also act as a migratory spot for some organisms. Migrating organisms are generally birds and mammals. Some birds make permanent nest on the branches of trees in sacred groves. When protect the sacred groves in good condition, then the number of organisms inside the groves also increases.

Civets and bats are most common among the 70 sacred groves of Palakkad district. A groups of bats noted on Large *Ficus benghalensis* L. and *Ficus religiosa* L. of Ekalavyasramam Karuppaswami Kshethram. A pair of Civets reported from black palms (*Borassus flabellifer* L.) of Pathiraunnath Mana and Athippatta Mana Nagakanya Kshethram. *Ficus benghalensis* L., *Ficus religiosa* L. and *Artocarpus hirsutus* Lam. are act as Keystone species. They provide food and shelter for a large number of organisms and thereby control the entire ecosystem. If the tree may destroy then the associated fauna will be spoil.

Soil is found to be highly diverse with clayey gravel of lateritic origin common in large areas. Predominance of *Pavetta indica* L., *Ixora brachiata Roxb. ex DC., Strychnos nux-vomica* L. indicates that the soil is generally less acidic in nature. Most of the groves have fertile soil with rich humus mainly because of the amount of litters decomposed inside the groves. The litter act as a water absorber and enriches the water table well. Generally this water harvesting technique is very much helpful to associated water bodies. The network formed by the roots of plants prevents soil erosion.

The precipitation rate and temperature of a region determines the vegetation type of that area. Over all vegetation type, its flowering and fruiting are the keys to assess the natural health of a vegetation.

For the ecological investigation of 70 sacred groves of Palakkad district localized in six taluks namely Alathur, Chittur, Palakkad, Mannarkkad, Ottapalam and Pattambi.Slight changes in their vegetation type is noted while moving from east to west. The eastern part of the district (Like Chittur and Palakkad taluks) is generally dry and greater temperature than the western regions. The precipitation rate is also different. Significant tree species are *Tectona grandis* L. f., *Putranjiva roxburghii* Wall., *Caryota urens* L., *Terminalia bellirica* (Gaertn.) Roxb., *Schleichera oleosa* (Lour.) Oken, *Xylia xylocarpa* (Roxb.) Taub., T*erminalia paniculata* Roth, *Antiaris toxicaria* Lesch., *Ficus benghalensis* L., *Artocarpus hirsutus* Lam.*etc.*

Breynia vitis-idaea (Burm. f.) C.E.C. Fisch., *Clerodendrum infortunatum* L., *Barleria cristata* L., *Crotalaria pallida* Dryand. *etc*. *Chassalia curviflora* (Wall. ex Kurz) Thwaites, *Briedelia retusa* (L.) A. Juss.,etc. are the most common shrubs observed from these groves. Most observed herbs are *Eleutheranthera ruderalis* (Sw.) Sch.-Bip. *Biophytum reinwardtii* (Zucc.) Klotzsch, *Dipteracanthus prostratus* (Poir.) Nees, *Boerhavia diffusa* L., *Cyathula prostrata* (L.) Blume, *Canscora diffusa* (Vahl) R. Br. ex Roem. & Schult., *Cleome viscosa* L., *etc.*

Rourea minor (Gaertn.) Merr., *Anamirta cocculus* (L.) Wight & Arn., *Gnetum edule* (Willd.) Blume, *Asparagus racemosus*, Willd., *Combretum albidum* G. Don, *Getonia floribunda* Lam., *Cissus heyneana* Steud., *Cayratia pedata* (Lam.) A. Juss. ex Gagnep., *etc.* are the significant climbers present in the groves. Climbers closely associated with trees for their growth.

Native plant species such as *Getonia floribunda* Lam., *Aglaia elaeagnoidea* (A. Juss.) Benth., *Briedelia retusa* (L.) A. Juss., *Alangium salviifolium* (L.f.) Wang., *Anamirta cocculus* (L.) Wight & Arn., *Amorphophallus paeoniifolius* (Dennst.) Nicolson, *etc*.are documented from these groves. *Caryota urens* L. and *Chassalia curviflora* (Wall. ex Kurz) Thwaites were present on most of the sacred groves.

5.3. Phytosociology

Phytosociological investigation were carried out in six sacred groves, Parakkattukavu Bhagavathi Kshethram (Alathur), Ethanur Pandalangatt Kavu (Chittur), Thiruvalathur Ayyappan Kavu (Palakkad) Athippatta Mana Nagakanya Kshethram (Mannarkkad), Pathirakunnath Mana (Ottapalam) and Cholakkavu Sivakshethram (Pattambi) with comparatively larger area and greater in biodiversity. However photography and collection of specimens are prohibited due to various reasons.

1. Parakkattukavu Bhagavathi Kshethram (Alathur Taluk)

Table. 12. Phytosocioloical analysis of tree species in Parakkattu kavu Bhagavathi Kshethram

Sl.No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Ailanthus triphysa* (Dennst.) Alston	9	23	2	3.4	60	7.0	0.39	10.803
2	*Albizia lebbeck* (L.) Benth.	11	28	3.57	4.2	70	8.1	0.72	13.059
3	*Alstonia scholaris* (L.) R. Br.	5	13	2.20	1.9	50	5.8	0.39	8.108
4	*Strychnos nux-vomica* L.	12	30	3.83	4.6	60	7.0	1.09	12.642
5	*Ficus benghalensis* L.	6	15	3	2.3	20	2.3	0.49	5.108
6	*Caryota urens* L.	31	78	4.11	11.8	90	10.5	2.18	24.477
7	*Bombax ceiba* L.	17	43	2.38	6.5	80	9.3	0.57	16.362
8	*Borassus flabellifer* L.	32	80	3.56	12.2	90	10.5	0.89	23.573
9	*Putranjiva roxburghii* Wall.	14	35	3	5.3	90	10.5	0.72	16.530
10	*Cassia fistula* L.	19	48	2.71	7.3	70	8.1	0.56	15.953
11	*Madhuca longifolia (Koenig) Macbr.*	3	8	1.50	1.1	20	2.3	0.27	3.740
12	*Terminalia paniculata* Roth	21	53	3.71	8	70	8.1	0.72	16.871
13	*Trema orientalis* (L.) Blume	20	50	2.44	7.6	90	10.5	0.69	18.790

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

Thirteen distinct species with GBH ≥ 30 cm were identified from the sampling region of Parakkattukavu Bhagavathi Kshethram out of the 200 total tree species. *Caryota urens* L. is the species with the greatest population size among

them, as shown by the Importance Value Index (IVI). Table 12 presents a phytosocioloical analysis of the tree species identified. IVI results show that the Parakkattukavu Bhagavathi Kshethram Kavu's most consecutive tree species were *Caryota urens* L. having IVI value of 24.477 followed by *Borassus flabellifer* L. (23.573), *Trema orientalis* (L.) Blume (18.790), *Terminalia paniculata* Roth (16.871), *Putranjiva roxburghii* Wall.(16.530). *Borassus flabellifer* L. displays the highest density (80 No/ha) and is succeeded by *Caryota urens* L. (78 No/ha) and *Terminalia paniculata* Roth (53 No./ha). The most frequent distribution was done by *Caryota urens* L., *Borassus flabellifer* L. *Putranjiva roxburghii* Wall. and *Trema orientalis* (L.) Blume. It was noted that the highest Relative Basal area in *Ficus benghalensis* L. (0.562). *Caryota urens* L. demonstrates maximum abundance and *Ailanthus triphysa* (Dennst.) Alston, *Alstonia scholaris* (L.) R. Br., *Bombax ceiba* L., *Trema orientalis* (L.) Blume, *Cassia fistula* L. displays the least amount of abundance in Parakkattukavu Bhagavathi Kshethram.

According to an analysis of the floral diversity of Parakkattukavu Bhagavathi Kshethram, the Shannon Wiener index was 2.396 and the Simpson's index was 0.902.

2. Ethanur Pandalangatt Kavu (Chittur Taluk)

Table. 13. Phytosocioloical analysis of tree species in Ethanur Pandalangatt sarpakkavu

Sl. No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Aegle marmelos* (L.) Correa	3	8	0.50	1.1	20	2.3	0.12	3.594
2	*Cassia fistula* L.	5	13	0.71	1.9	30	3.5	0.20	5.593
3	*Cleistanthus collinus* (Roxb.) Benth. ex Hook. f.	4	10	2.20	1.5	20	2.3	0.21	4.066
4	*Ixora brachiata Roxb. ex* DC.	6	15	3.83	2.3	40	4.7	0.23	7.125
5	*Mallotus philippensis (Lam.) Muell.Arg.*	2	5	3	0.8	20	2.3	0.28	3.367

Sl. No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
6	*Morinda pubescens* J. E. Smith	2	5	4.11	0.8	10	1.2	0.28	2.204
7	*Borassus flabellifer* L.	3	8	2.38	1.1	30	3.5	0.27	4.902
8	*Putranjiva roxburghii* Wall.	2	5	3.56	0.8	10	1.2	0.18	2.108
9	*Streblus asper* Lour.	4	10	3	1.5	30	3.5	0.09	5.106
10	*Strychnos nux-vomica* L.	7	18	2.71	2.7	50	5.8	0.29	8.777
11	*Spathodea campanulata* P.Beauv.	1	3	1.50	0.4	10	1.2	0.16	1.703

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

According to the results of the phytosociological investigation conducted in Ethanur Pandalangatt Kavu, 39 individuals belonging to 11 different tree species were found in the sample area. Phytosociological examination of the tree species shown in Table 13. IVI measurements show that the area's most prevalent tree species was *Strychnos nux-vomica* L. having an IVI value of 8.777 followed by *Ixora brachiata Roxb. ex* DC.(7.175)., *Strychnos nux-vomica* L. is the species of tree with the highest number of individuals and density (18 No./ha), followed by *Ixora brachiata Roxb. ex* DC.(15 No./ha). *Strychnos nux-vomica* L. has the greatest frequency and relative basal area *Morinda pubescens* J. E. Smith (4.11) has the highest abundance, whereas the lowest is found in *Spathodea campanulata* P.Beauv., *Cassia fistula* L. and *Aegle marmelos* (L.) Correa. Maximum frequency is 50 in *Strychnos nux-vomica* L.

When the floristic diversity of Ethanur Pandalangatt Kavu was examined using diversity indices, the results revealed that the Shannon Wiener index was 2.272 and the Simpson's index was 0.909.

3. Thiruvalathur Ayyappan Kavu (Palakkad taluk)

Table. 14. Phytosocioloical analysis of tree species in Thiruvalathur Ayyappan Kavu.

Sl.No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Alstonia scholaris* (L.) R. Br.	2	5	0.33	0.8	20	2.3	0.22	3.309
2	*Cassia fistula* L.	5	13	0.71	1.9	50	5.8	0.22	7.945
3	*Madhuca longifolia* (Koenig) Macbr.	1	3	2.20	0.4	10	1.2	0.23	1.774
4	*Ficus exasperata* Vahl.	3	8	3.83	1.1	30	3.5	0.38	5.009
5	*Hydnocarpus pentandrus* (Buch.-Ham.) Oken	6	15	3	2.3	40	4.7	0.50	7.442
6	*Morinda pubescens* J. E. Smith	3	8	4.11	1.1	30	3.5	0.74	5.375
7	*Sapindus trifoliatus* L.	4	10	2.38	1.5	10	1.2	0.27	2.961
8	*Sterculia guttata* Roxb. ex DC.	3	8	3.56	1.1	20	2.3	0.01	3.478
9	*Streblus asper* Lour.	5	13	3	1.9	40	4.7	0.39	6.946

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

From the Thiruvalathur Ayyappan kavu sample region, 32 tree species with GBH ≥ 30 cm, representing eight distinct species, were identified. Examination of the tree species listed in Table 14. With an IVI score of 7.945, *Cassia fistula* L.was the most succeeding tree species in the area, followed by *Hydnocarpus pentandrus* (Buch.-Ham.) Oken (7.442) and *Streblus asper* Lour.(6.946). *Hydnocarpus pentandrus* (Buch.-Ham.) Oken which recorded the highest number of individuals and the highest density (15 No. /ha.), followed by *Cassia fistula* L. and *Streblus asper* Lour. *Cassia fistula* L. is the most frequent tree species. *Madhuca longifolia* (Koenig) Macbr. having highest basal area. *Morinda pubescens*

J. E. Smith shows highest and *Alstonia scholaris* (L.) R. Br. shows lowest abundance.

The Shannon Wiener index was 2.101 and the Simpson's index was 0.897 in Thiruvalathur Ayyappan Kavu's floristic diversity.

4. Athippattamana Nagakanya Kshethram (Mannarkkad taluk)

Table. 15. Phytosocioloical analysis of tree species in Athippattamana Nagakanya Kshethram

Sl.No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Alstonia scholaris (L.) R. Br.*	1	3	0.17	0.4	10	1.2	0.01	1.555
2	*Borassus flabellifer* L.	9	23	1.29	3.4	90	10.5	0.07	13.969
3	*Caryota urens* L.	9	23	2.20	3.4	70	8.1	0.07	11.643
4	*Antiaris toxicaria* Lesch.	1	3	3.83	0.4	10	1.2	0.23	1.770
5	*Morinda pubescens* J. E. Smith	5	13	3	1.9	30	3.5	0.17	5.570
6	*Mallotus philippensis* (Lam.) Muell.Arg.	5	13	4.11	1.9	20	2.3	0.28	4.512
7	*Sterculia guttata Roxb. ex DC.*	6	15	2.38	2.3	40	4.7	0.18	7.125
8	*Streblus asper Lour.*	7	18	3.56	2.7	60	7	0.22	9.869
9	*Cassia fistula* L.	9	23	3	3.4	80	9.3	0.49	13.228
10	*Sapindus trifoliatus L.*	4	10	2.71	1.5	20	2.3	0.26	4.113

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

From the Athippattamana Nagakanya Kshethram investigation region, a total of 56 tree species with GBH ≥ 30 cm, representing eight distinct species, were recorded. Examination of the tree species found in Table 15. The *Borassus flabellifer* L. tree species, with an IVI value of 13.969, was the most successive in the area followed by *Cassia fistula* L. (13.228) and *Caryota urens* L. (11.643).

Greatest quantity of individuals recoreded from the species *Cassia fistula* L. (23 No./ha) followed by *Borassus flabellifer* L. and *Caryota urens* L. *Borassus flabellifer* L. is the most frequent species. Highest measured relative basal area in *Antiaris toxicaria* Lesch.. *Mallotus philippensis* (Lam.) Muell.Arg. is the most abundant species.

The floristic diversity of Athippattamana Nagakanya Kshethram was measured with a Shannon Wiener index of 2.144 and a Simpson's index of 0.889.

5. Pathirakunnath Mana (Ottapalam taluk)

Table. 16. Phytosocioloical analysis of tree species in Pathirakunnath Mana

Sl. No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Ixora brachiata* Roxb. ex DC.	4	10	0.67	1.5	40	4.7	0.18	6.362
2	*Adenanthera pavonina* L.	1	3	0.14	0.4	10	1.2	0.11	1.656
3	*Cassia fistula* L.	5	13	2.20	1.9	20	2.3	0.18	4.410
4	*Strychnos nux-vomica* L.	8	20	3.83	3.1	70	8.1	0.39	11.579
5	*Spathodea campanulata* P.Beauv.	3	8	3	1.1	10	1.2	0.16	2.467
6	*Mallotus philippensis* (Lam.) Muell.Arg.	6	15	4.11	2.3	50	5.8	0.28	8.382
7	*Holigarna arnottiana* Hook.f.	2	5	2.38	0.8	10	1.2	0.23	2.152
8	*Putranjiva roxburghii* Wall.	5	13	3.56	1.9	20	2.3	0.18	4.416
9	*Macaranga peltata* (Roxb.) Muell.-Arg.	9	23	3	3.4	90	10.5	0.89	14.794
10	*Zanthoxylum rhetsa* (Roxb.) DC.	4	10	2.71	1.5	20	2.3	0.07	3.920
11	*Caryota urens* L.	9	23	1.50	3.4	80	9.3	0.07	12.806

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

According to the results of the phytosociological investigations conducted in Pathirakunnath Mana, 56 individuals from 11 different tree species were found in the exploration area. Table 16 presents a phytosocioloical analysis of the tree species included. Aa per IVI value *Macaranga peltata* (Roxb.) Muell.-Arg.(14.794) is the most successive species in Pathirakunnath Mana followed by *Caryota urens* L.(12.806) and *Strychnos nux-vomica* L.(11.579). *Macaranga peltata* (Roxb.) Muell.-Arg. (23 No./ha) and *Caryota urens* L. (23 No./ha) having maximum number of individuals and density . The greatest frequency and basal area are shown by *Macaranga peltata* (Roxb.) Muell.-Arg. followed by *Caryota urens* L. *Mallotus philippensis* (Lam.) Muell.Arg. is the most abundant species and the lowest one is *Adenanthera pavonina* L.(0.14).

When Pathirakunnath Mana's floristic diversity was examined using diversity indices, Simpson's index was 0.902 and Shannon Wiener index was 2.261.

6. Cholakkavu Sivakshethram (Pattambi taluk)

Table. 17. Phytosocioloical analysis of tree species in Cholakkavu Sivakshethram

Sl. No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
1	*Aegle marmelos* (L.) Correa	2	5	0.33	0.8	10	1.2	0.05	1.971
2	*Cassia fistula* L.	3	8	0.43	1.1	30	3.5	0.10	4.729
3	*Tectona grandis* L. f.	4	10	2.20	1.5	20	2.3	0.05	3.901
4	*Saraca asoca* (Roxb.) de Wilde	2	5	3.83	0.8	20	2.3	0.24	3.330
5	*Mallotus philippensis* (Lam.) Muell.Arg.	3	8	3	1.1	30	3.5	0.19	4.822
6	*Ficus religiosa* L.	1	3	4.11	0.4	10	1.2	0.17	1.712

Sl. No.	Name of species	No. of individuals	D (No/ha)	AB	RD	F	RF	RBA	IVI
7	*Morinda pubescens* J. E. Smith	7	18	2.38	2.7	30	3.5	0.07	6.225
8	*Caryota urens* L.	4	10	3.56	1.5	20	2.3	0.04	3.890
9	*Artocarpus heterophyllus* Lam.	1	3	3	0.4	10	1.2	0.70	2.244
10	*Strychnos nux-vomica* L.	8	20	2.71	3.1	30	3.5	0.35	6.892
11	*Azadirachta indica* A. Juss.	1	3	1.50	0.4	20	2.3	0.03	2.739
12	*Holigarna arnottiana* Hook.f.	2	5	3.71	0.8	10	1.2	0.09	2.018

AB: Abundance; D: Density; F: Frequency; IVI: Importance value index; RBA: Relative basal area; RD: Relative density; RF: Relative frequency.

The study on phytosociology conducted in Cholakkavu Sivakshethram investigation area noted the presence of 38 individuals belonging to 12 different tree species. Botanical examination of the tree species shown in Table 17. *Strychnos nux-vomica* L.is the most successive tree species having an IVI value of 6.892 followed by *Morinda pubescens* J. E. Smith (6.225). *Strychnos nux-vomica* L. having maximum density of 20 No./ha followed by *Morinda pubescens* J. E. Smith (18No./ha). Highest relative basal area noted in *Artocarpus heterophyllus* Lam.. Maximum frequency observed in *Cassia fistula* L., *Mallotus philippensis* (Lam.) Muell.Arg., *Morinda pubescens* J. E. Smith and *Strychnos nux-vomica* L. *Ficus religiosa* L. is the highest abundant species.

When the floristic diversity of Cholakkavu Sivakshethram was examined using diversity indices, the results revealed that the Shannon Wiener index was 2.266 and the Simpson's index was 0.900.

When comparing the phytosociological aspects of these six sacred groves, the species with the largest density was found, *Borassus flabellifer* L. (80No/ha)

followed by *Caryota urens* L. (78 No/ha) in Parakkattukavu Bhagavathi Kshethram. The species' lowest density was found in *Spathodea campanulata* P.Beauv. (Three No/ha) in Ethanur Pandalangatt Kavu, *Ficus exasperata* Vahl (Three No/ha) in Thiruvalathur Ayyappan kavu, *Alstonia scholaris* (L.) R.Br. (Three No/ha), *Antiaris toxicaria* Lesch. (Three No/ha) in Athippatta Mana Nagakanya Kshethram, *Adenanthera pavoniana* L. (3 No/ha) in Pathirakunnath Mana and *Ficus religiosa* L. (Three No/ha), *Artocarpus heterophyllus* (Three No/ha)Lam., and *Azadirachta indica* A. Juss. (Three No/ha) in Cholakkavu Sivakshethram. Maximum frequency 90 of species was observed in Parakkattukavu Bhgavathi Kshethram

When it came to the Importance Value Index, the species had the highest value, *Caryota urens* L. (24.477) in Parakkattukavu Bhagavathi Ksherthram.

While considering the diversity indices Simpson's index was biggest in Ethanur Pandalangatt Kavu (0.909) and Parakkattukavu Bhagavathi Kshethram (0.902) smallest in Athippatta Mana Nagakanya Kshethram (0.889). Consequently, the greatest amount of variety was found in Athippattamana Nagakanya Kshethram.

The Shannon Wiener index peaked in Parakkattukavu Bhagavathi Kshethram (2.396) and lowest in Thiruvalathur Ayyappan Kavu (2.101). The Shannon Wiener index indicates that there are more unique species found in Parakkattukavu Bhagavathi Kshethram more varied species can be found in Thiruvalathur Ayyappan kavu.

5.4. Socio cultural aspects on sacred groves

Sacred trees are banned from cutting and not axed except when wood is needed for the religious purposes such as death ceremonies, worshiping, renovation work of the temple etc. Sacred groves are not very many in number compared with other districts of Kerala. As per the historical data most of the temples previously possessed thousands of acres of land. Temples lost such huge quantity of land due to the implementation of Land Reforms Act in Kerala state.

Sacred groves are commonly known as Pampinkavu or Veluthankavu. On investigation, it was observed that there exists either zero vegetation, nor even a tree but just a stone or an idol. Such purported kavu are not taken for study. Most of the sacred groves belong to Brahmin community (Nampoothiry families). Some of sacred groves are controlled by Nair, Ezhava and Viswakarma communities. Kariyattil sarpakavu is of harijan families.

Some groves located in the border villages of Tamilnadu have its own peculiar religious rites and worship practices. All classes of Hindu consider worship of Naga is divine. Nagam, Nagaraja, Nagakanya, Nagayakshi, Nagabhagavathi, Nagabrahma, Karinagam, Maninagam, Anjanamaninagam, Ananthamaninagam, etc. are some serpentine spirits worshiped in the sacred groves of Palakkad district generally. Some other dieties are Ayyappan, Sasthavu, Vettekkorumakan, Karuppaswami, Kuttichathan, Moothaar, Karanavar .etc. In which Karuppaswami only seen in eastern Palakkad region having great affinity towards Tamil culture. A stone basement known as chithrakoodam and stone sculptures of naga are present in sacred groves.

Animal sacrifice viz. goat, cock or duck are killed after pooja and cooked in Ekalavyasramam Karuppswami Kshethram and this animal sacrifice only noted in Ekalavyasramam. Noorumpalum in Ayillyam, Kathirvela in Thulam, Kalamezhuthupattu in Vrishchikam, Ponninpoovu in Makaram, Aluvela in Edavam, Pampumthullal, Sarpa bali, Vellarinivedyam etc. are the common offerings in sacred groves.

A special type of vazhipadu observed in Hariharakunnu temple, people bring Naga idols and submit in assignes places. Folk art pampum thullal or sarpam thullal is performed to the serpentine deiety at regular intervals. Both upper and lower cast perform '*Pulluvan pattu,* as serpentine worship. (Plate 32 &33).

As per the believes serpentine gods like shady areas and trees having latex producing capacity. All these convictions safeguard the groves from outside aggravations as well as biodiversity conservation. Collection of wood and associated materials is strictly banned in sacred groves. Only priest permitted to

entry inside the grove. Women are prohibited during their menustral period except in Ekalavyasramam Karuppaswami Kshethram. If some one breaks this rules, people belives that serpentain gods punish them in the form of different diseases like lack of progeny, skin problems etc. All organisms inside the groves are protected. The prohibitions are rigid and helpful for the protection of sacred groves and their by ensures biodiversity conservation.

Kalamezhuth is very common during sarpam thullal. The kalam is similar to mural arts, the five colours of 'kalam' represents Panchabhootha (Five senses). Red colour is prepared by mixing calcium oxide with turmeric powder (*Curcuma longa* L.), Green colour is prepared by powdering the dried leaves of *Mallotus philippensis* (Lam.) Muell.Arg. or *Dendrophthoe falcata* (L. f.) Ettingsh. black colour by the ashes of paddy husk (Umikkari), white colour by rice powder and turmeric (*Curcuma longa* L.) powder used for yellow. Women are placed at the centre of kalam having tender inflorescence of *Areca catechu* L. in their hands. They wiped off the kalams after pooja and predict some words about the future of correspondence family.

Sarpam thullal were conducted after sunset for the effective participation of local people and to create a divine atmosphere. Ashtangakkalam, Nagarajakkalam, Santhanakkalam, Nagayakshikkalam, Mangalyakkalam, Poothakkalam, Ananthashayanakkalam, etc. are common in sacred groves of Palakkad especially during Malayalam month Vrischikam (November – December). (Plate 32 & 33)

5.5. Threats in sacred groves of Palakkad district

Sacred groves are natural abode of many life forms and their strictly conserved status helps us better management in a conservation point of view. Sacred groves are biologically important places having maximum species diversity and richness. Besides this they form a significant ecosystem in the terrestrial biome. People conserved these forest patches only because of religious faith. Groves includes plenty of medicinally and economically significant plants as well as IUCN redlisted plants. The concept of sacred grove was emerged during the age



Plate 28. Threats in sacred groves of Palakkad
(Roads seperates sacred groves)
A. *Nottathe Tharavadu Nagakavu* **B.** *Pullanikkulangara Kutumbakavu*
C. *Mandakathinkal Kudumbakavu* **D.** *Kunnathu Tharavattukavu*
E. *Kizhakkekkara Tharavadu Nagakavu* **F.** *Puthanpurakkal Tharavadu Veluthankavu*

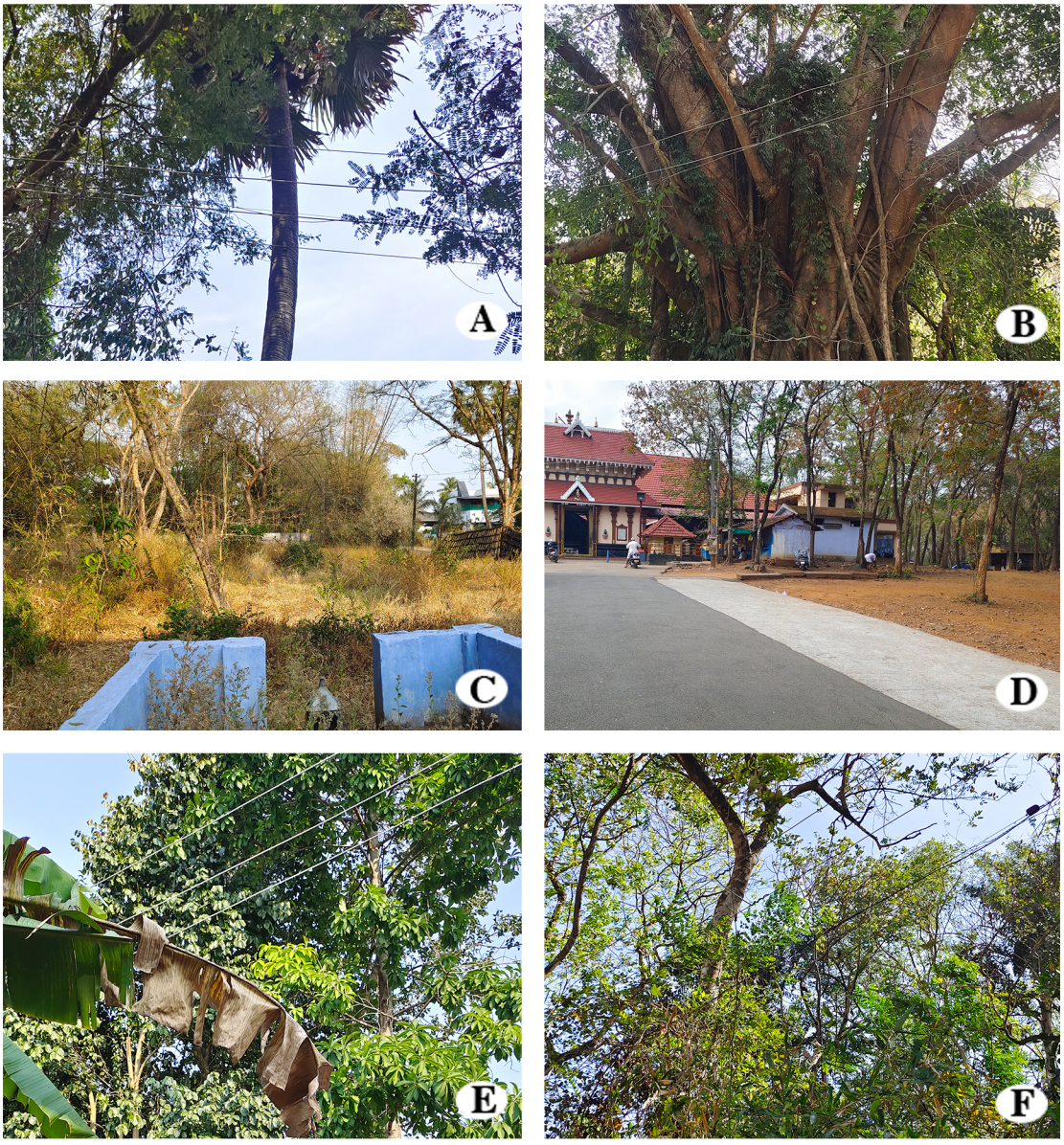

Plate 29. Threats in sacred groves of Palakkad
(Electric lines passing through sacred groves)
A. *Azhakappathukavu* **B.** *Cherukadu Sarpakkavu*
C. *Kannadi Variyam Pambumkavu* **D.** *Parakkattukavu Bhagavathi Kshethram*
E. *Punnakkodu Nagakshethram* **F.** *Kundupalliyalil Sarpakavu*

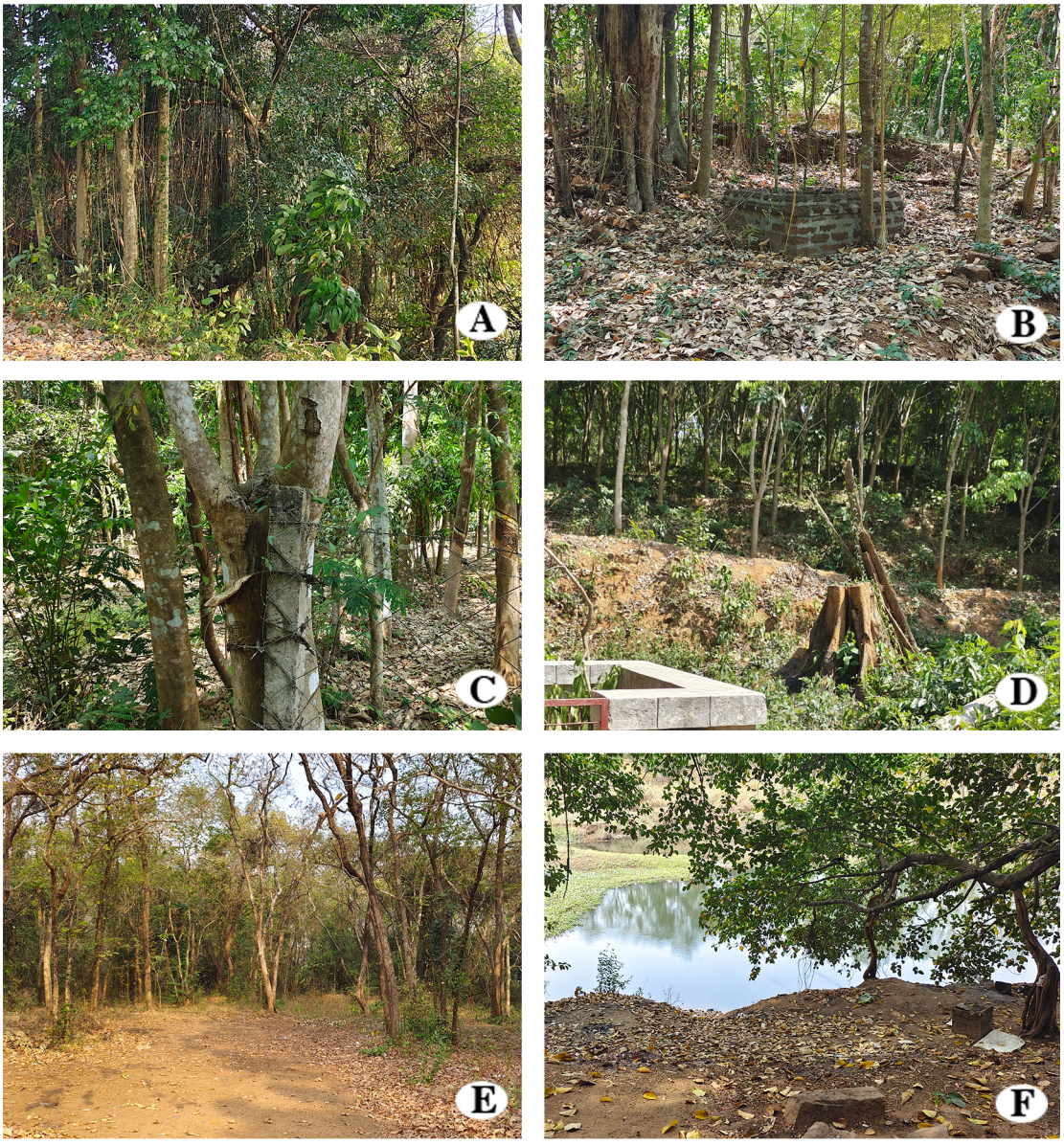

Plate 30. Threats in sacred groves of Palakkad

(Agroforestry related disturbances)

A. *Kallingal Tharavattukavu* **B.** *Thavalakkottil Kavu*

C. *Puthanpurakkal Tharavadu Veluthankavu* **D.** *Kandayil Kavu*

(Pollution related disturbances)

E. *Parakkattu Bhagavathi Kshethram* **F.** *Ekalavyasramam Karuppaswami Kshethram*



Plate 31. Threats in sacred groves of Palakkad

(Invasive species related disturbances)

A. *Madathody Naga Kavu* **B.** *Tholanur Valiyathodi Kavu*

C. *Cholayilthazhathu Veluthan kavu* **D.** *Erattukoothan Tharavattukavu*

(Construction of temples inside groves)

E. *Thiruvadi Kunnath Kavu* **F.** *Kizhakkemundarath Kavu*

G. *Azhcahth TharavattuKavu* **H.** *Perumarathin Kavu*

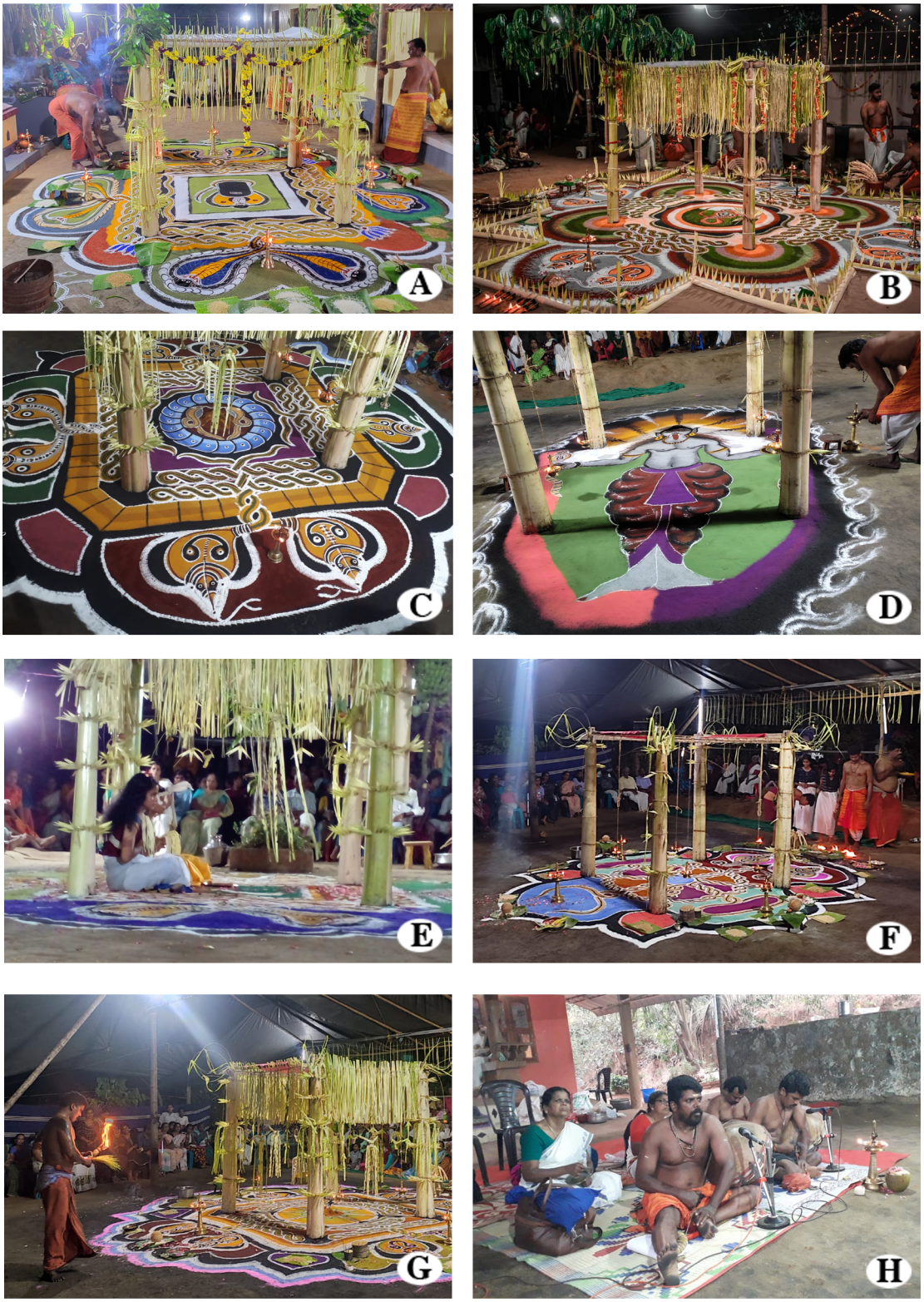

Plate 32. Rituals in sacred groves of Palakkad
Sarpakalam (**A, B, C, D**), *Sarpam thullal* (**E, F**)
Thiri uzhichil (**G**), *Pulluvan paattu* (**H**)

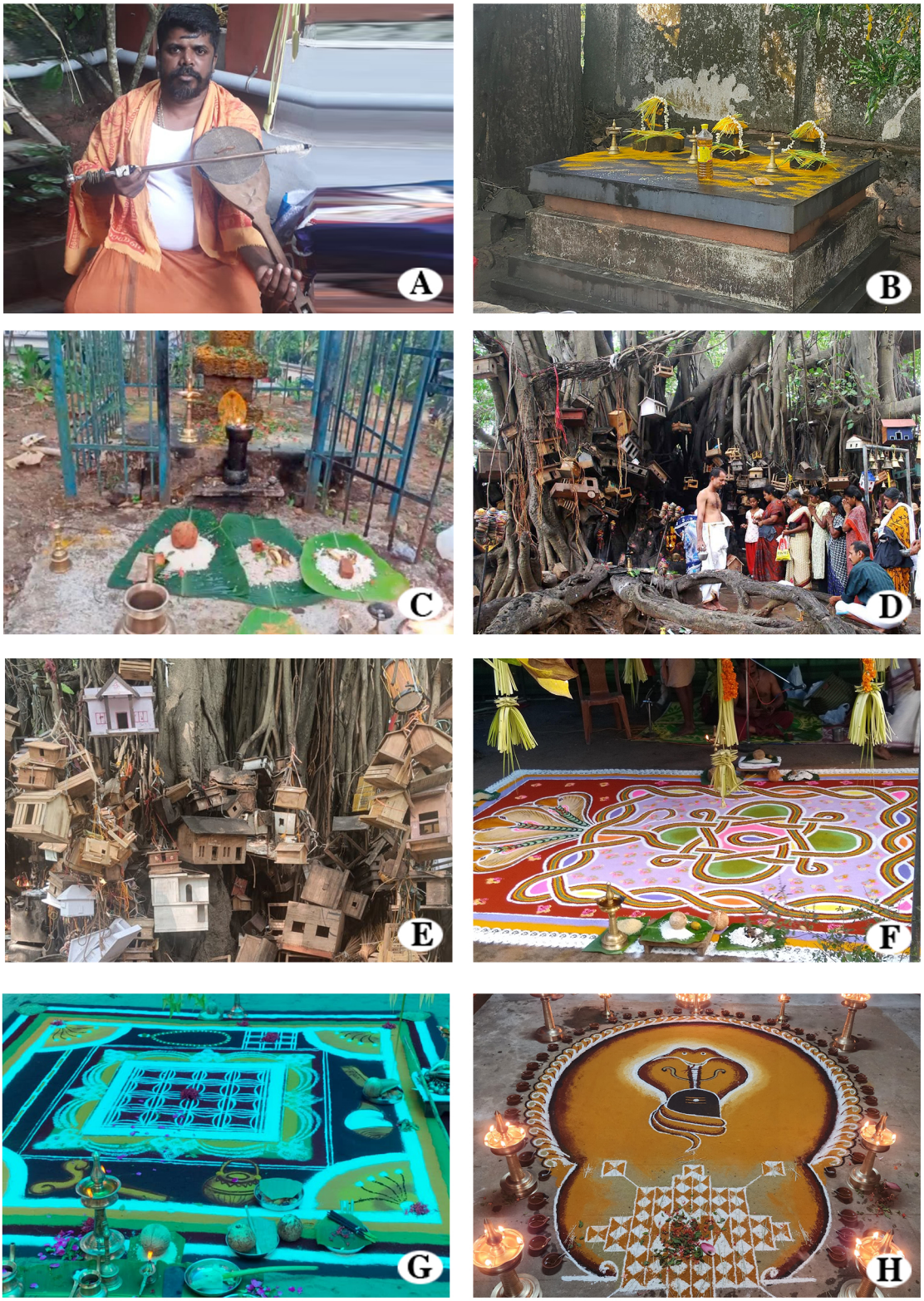

Plate 33. Rituals in sacred groves of Palakkad

A. *Pulluvar veena,* **B & C.** *Sarpa pooja,* **D & E.** *Offering in Ekalavyasramam Karuppaswami kshethram,* **F & G.** *Sarpa kalam,* **H.** *Sarpa bali pooja*

of joint families and vanishing the conversion of nano families. Most of the groves lost their land and vegetation during land partition. Some others eliminated the diety from the grove to serpentine temple by a pooja named *Kudiyozhippikkal* or *Ozhippikkal.* When the traditional conviction framework started to change the religious concept of sacred grove is also changed.

The sacred groves of Palakkad district are very limited in number when compared to remaining districts of the state. Most of these groves are at the edge of extinction. The threats may be internal or external. External threats mainly anthropogenic such as construction and renovation works, fragmentation of land, conversion of land, land mining, waste deposits, grazing.etc. Establishment of invasive species, soil erosion, etc. are the internal threats. (Plate 28, 29, 30 & 31)

People started to worship nature from historical era then they assumed dieties for certain purposes. The lands allotted for dieties are protected as sacred groves without any disturbances. This is is indispensable for durability of natural assets like water and forest cover. But the system is altered gradually and the conservation of nature become less significant. Unawareness of people made drastic and irreversible changes to the groves and biodiversity. The cultural change resulted in the wipe out of the vegetation from the groves and manitained only the idols. The decline includes land loss as well as vegetation loss.

Increased land needs of the nuclear family partitioned the grove not the diety. They wiped the bigger areas and placed the dieties under single small trees. Land convertion resulted in total vegetation loss. The resulted habitat loss and other construction activities disturbed the fauna. Consequently fragmentation altered the innate biodiversity.

Some of the groves converted in to modern day temples invited more and more devotees and thereby increased the disturbance. Man made offerings polluted the groves completely and affected the biodiversity. (Plastic carry bags, vessels. etc.).

In some sacred groves detection of natural boundary is highly difficult.Cattle grazing and anthropogenic activities are higher in the areas without compound walls. Compound walls regulate soil erosion up to a limit. However concrete walls disturb the rootsystem of plants.

The area of sacred groves again decreased due to developmental activities like construction of road and new electrical lines. Such processes disturb the flora and fauna inside the grove thereby affecting the biodiversity. Traversing electric lines are harmful to birds and bats.

Some times unprotected groves may become public waste yard. Domestic wastes include both biodegradable and non – biodegradable were thrown inside leads to pollution. This waste dumping affect plants and animals. Plastic wastes alter the soil texture inside the groves and block the passages of root system. E – wastes causes hazardous effects to the sacred groves as well as the surrounding ecosystem.

The gradual process of soil erosion includes soil deposition, movement, and separation. Soil erosion causes the loss of top productive soil during periods of heavy rainfall. The process proceeds largely undetected, leading to a significant loss of topsoil—rich in organic matter, fertility, and soil life—which is transported "off-site" to fill in drainage channels. It slows down the growth of plants and contaminates nearby water supplies. Loss of soil can have an impact on the texture, stability, structure, and quality of the soil. These alterations also impact the soil's ability to retain water, making it more vulnerable to harsh environments like drought. Additionally, a lot of plant seeds are lost with the soil, which has a negative impact on plant regeneration. Walls within compounds and large trees can avert this grave calamity for the sacred groves.

Invasive species are introduced in to an area accidently with species having economic gain (Usually by human activities). When they introduced in to an area then they spreads its own. Regardless of the mechanism of introduction, many introduced species have spread, invading native habitats. In many cases, exotics compete with natives for resources. often displacing them.

Overcrowding of invasive weeds like as *Mikania micrantha* Kunth, *Chromolaena odorata* (L.) King & H. Rob. etc. leads to total habitat distruction and biodiversity loss. Invasive plant grow vigorously and aggressively, they reproduce very quickly and compete for resources such food, water, shelter..etc. causes native biodiversity loss.

Conversion of sacred grove land to agricultutral land is another threat to sacred groves. The groves situated near agricultural fields and plantations, without any fence or compound wall have a great chance for land conversion. This reduces sacred grove area as well as biodiversity.

Quarrying of land and rocks are hazardous for the existence of sacred groves. The fertile upper soil which is crucial for the groves lost by mining. The entire process negatively affect on biodiversity. The effects of land quarrying on the environment include noise pollution, air, water, and forest damage as well as biodiversity loss.etc.

Construction of temples inside the groves, fragmenting groves by roads critically affect the normal structure and functioning of groves.

5.6. Efficient conservation measures to protect sacred groves

Sacred groves are sacred places and the property of diety. Nature worship has been a key force in shaping the human attitude towards conservation and sustainable utilization of natural resources. Groves are treasure houses of biodiversity. It is significant from a social, ecological, economic, medical, and cultural standpoint. Its preservation in its original form will help with future research and study. They represent the communities' value system in addition to being small forests. Important genetic resources have been preserved by the groves' native flora and wildlife. Sacred groves are the last remainings of widespread ecosysytem in that region. However most of the sacred groves are under private ownership hence their protection is difficult. Adequate Government support is required in order to preserve sacred groves. The following are strategies for conservation.

1. Conduct awareness programmes on protection of sacred groves and its

importance arefor the custodians of the groves and local people at local body level.

2. Government may consider implementing a Satellite Model Protection Programme (SMPP) for the protection of sacred groves irrespective of their ownership.
3. Government may ensure financial assistance to the sacred groves for theirmaintenance.
4. Production of quality seedlings of native plants and handover them to the custodians and ensure their planting in the degraded patches of sacred groves.
5. Threat detection and recording in sacred groves shall be under taken by local bodylevel
6. Construction of biofencing, earthern walls (Mannukayyala and Kallukayyala) insacred groves for their protection.
7. Water resources inside the groves shall be renovated by MGNREGS workers toimprove their storage capacity.
8. Collection of plastic and e-wastes from the groves by Harithasena is recommended.
9. Encourage the avoidance of disposing of rubbish within sacred groves and raise awareness about the harmful effects of plastics and non-biodegradable materials.
10. Prevent construction work inside the groves and also shift electric lines passingthrough it.
11. Eradicate invasive plants from the groves and create awareness about the harmfuleffect of invasive plants to the custodians.
12. Discourage beautification programme inside the groves using exotic and ornamentalspecies.
13. Constitute a Grama Panchayath Level Committee (GPLC) for the protection of sacredgroves.
14. Promote research in sacred groves Carbon sequestration.

Chapter VI

DISCUSSION

Sacred groves are considered as one of the hot spot of plant biodiversity. It serves as markers for native vegetation and is essential to societal well-being (Schaaf, 1998). Sacred groves are tracts of virgin forest with rich diversity, which have been protected by the local people for centuries for their cultural and religious beliefs and taboos that the deities reside in them and protect the villagers from different calamities. Every sacred grove carries its own legends, lore, and myths which form the integral part of the sacred grove. To evaluate sacred groves' ecological importance and develop conservation measures, it is imperative to have a comprehensive understanding of their current state, structure, and function (Khan *et al.*, 2008).These groves have a distinctive ecology due to their distinctive floral characteristics. Local communities oversaw their management, and the tactic used to preserve these pristine forests is forbidden.

A total of 50 small sacred groves were recorded in Dehradun. Of these, 76 plant species—including attractive, edible, and medicinal plant species—were found in diverse sacred groves across 52 families and 69 genera. (Nazir *et al.*, 2014). Following an exploratory investigation in Madathody Nagakavu, which is located in Chalavara Gramapanchayath, Ottapalam taluk of Palakkad district, Kerala, 50 species belonging to 49 genera and 25 families were discovered. Of them, 38 medicinal plants including six endemic, rare and red-listed plants are included here. (Praveenkumar, 2018).

In the present investigation 70 sacred groves in Palakkad district were studied and 529 species being a part of 377 genera and 115 families are reported and it It consists of edible, economically and medicinally important plants. The investigation in selected sacred groves of Kodungallur taluk of Thrissur district disclosed a sum of 89 taxa belonging to 83 genera and 43 families of angiosperms includes 98.88% plants species are medicinally significant, used in various systems of medicines. (Deepa *et al.*, 2016).

Sacred groves are situated in various taluks – Alathur, Chittur, Palakkad, Mannarkkad, Ottapalam and Pattambi. The culture and maintenance practices of the groves are entirely different. Parakkattukavu Bhagavathi Kshethram

(Kavassery, Alathur) is the largest one Thuppalatharavadu (Kollengode, Chittur) is the smallest one. Athippatta mana is having maximum species diversity followed by Parakkattukavu Bhagavathi Kshethram and Ethanur Pandalangattu kavu whereas Punnakkodu Nagakavu having minimal species divesrsity which indicates that no direct relation between area and floral diversity of sacred groves.

Red listed plants as per the IUCN criteria consists of endangered, critically endangered, vulnerable, data deficient, not evaluated and least concern species like *Chionanthus mala-elengi* (Dennst.) P. S. Green, *Aegle marmelos* (L.) Correa, *Hydnocarpus pentandra* (Buch.-Ham.) Oken, etc. are present in various sacred groves of Palakkad district. Comparable research work was directed in sacred groves of Thrissur district by Deepa (2016) and documented 339 plant species included endemic and endangered species like *Syzygium travancoricum* Gamble. etc. The presence of numerous threatened plant species was revealed by the investigations of Nair and Mohanan (1981). Nidhi and Kousalya conducted a survey and studies on floristic diversity and phytosociology at the Maniyoor Subramanya Swamy temple in Kannur. Their findings showed that there were 111 vascular plants in the temple, classified into 46 families and 106 genera, of which 105 were angiosperms; five of these were pteridophytes, and there was also one gymnosperm (Nidhi *et al.,* 2021).

Memecylon talbotianum Brandis, *Drypetes sepiaria* (Wight & Arn.) Pax & K. Hoffm, *Couroupita guianensis* Aubl. and *Phyllanthus virgatus* G. Forst. are the vegetation found in sacred groves demonstrates anti-inflammatory and antioxidant properties (Gadamsetty *et al.,* 2013; Gousia *et al.*, 2013; Bharathi *et al.,* 2014). Important medicinal plants were discovered during an investigation conducted in the sacred groves of Sreedharan Chumarathumana, Muthuthala Panchayath, Pattambi Taluk, Palakkad district, Kerala. Future generations urgently need to preserve these priceless sacred groves. (Abhinand *et al.,* 2020). From the Cherukodu sacred grove, 44 species of ethnomedically significant plants from 26 families and including endangered species. These 44 species are reported to be used in therapeutic purposes by Native Americans. The life of

the locals are significantly impacted socioculturally by these little woodlands. Based on religious myths, the environment is properly safeguarded. (Soumyasree, *et al.* 2022).

Sacred groves serve as archives and nurseries for numerous economically and medicinally significant plant species. Many medicinally significant plant species present inside the groves are utilized in various systems of medicine like Folk, Unani, Ayurveda, Sidha. etc. 303 out of 529 plants reported from the sacred groves of Palakkad district are used for the treatment of different illnesses such as cold, cough, itching, fever, skin diseases etc. A sum of 70 species are listed in which 51 species (73%) harbor different medicinal uses and about 15 species were red listed during the investigation of sacred groves in Kannur district. (Athulya and Anitha, 2016). Unscientific collection of medicinally important plants and over exploitation of other plant species causes the loss of rich biodiversity. (Rao and Sunitha, 2011).

In Hindu religious rituals, nature worship plays a significant role. The sociocultural and environmental components of cultures are greatly influenced by these practices and traditions (Bithin, 2019).

In sacred groves of Alathur taluk, trees are larger in number in compared to herbs, shrubs and climbers. There are more herbs and shrubs in the disturbed zone (Nair 1992). Investigation and floral studies in Iringole kavu in Ernakulam district of Kerala documented 94 plant species of 85 genera and 52 families and revealed that herbaceous species dominate the vegetation (Subramanian *et al* 2005).

In sacred groves of Palakkad district, varied sizes, different deities were worshipped. However, these groves were all preserved because of religious convictions. On remote land where people have strong social and religious convictions, sacred groves are maintained. (Kulkarni and Shindikar, 2005). Majority of the sacred groves of Palakkad district are owned by family members or nearby communities. The idea that local people provide better management and preservation for sacred groves is supported by the observation that reported groves and sacred groves in the southern Eastern Ghats displayed less

evidence of damage than the reference forest stands Rao *et al* (2011). Two ecologically relevant species, such as *Salvinia molesta* (African payal) and *Marsilea minuta*, were found to be widely distributed as weeds in ponds and rice fields during a study of eighteen sacred groves in the Chalavara Grama Panchayath. (Praveenkumar, *et al.,* 2018).

'Noorum palum' (milk and lime), Payasanivedyam, Sarpam thullal, Sarpabali, Kalam are the preferred offerings to Serpent Gods. Kalampattu along with sarpam thullal is very common among malayalam month vrischikam and it is carried out by Pulluvans (a cast) with instrument's assistance known as 'pullorkudam' and 'Pulluvarveena'. Two distinct kinds of kalams were significant namely 'nagayakshikalam' and 'nagarajakalam' Jayashanker (2006).

The tree species *Caryota urens* L., *Ficus religiosa* L., are abundant in Parakkattukavu Bhagavathi Kshethram, and Cholakkavu Siva Kshethram respectively. *Morinda pubescens* J.E. Smith is abundant in Ethanur Pandalangatt Kavu and Thiruvalathur Ayyappan kavu. *Mallotus philippensis* (Lam.) Muell.Arg., is abundant in Athippattamana Nagakanya Kshethram and Pathirakunnath Mana. The species *Ailanthus triphysa* (Dennst.) Alston*, Alstonia scholaris* (L.) R. Br.*, Bombax ceiba* L., *Trema orientalis* (L.) Blume, *Cassia fistula* L. displays the least amount of abundance in Parakkattukavu Bhagavathi Kshethram Wheareas the lowest abundance of following species is found in Ethanur Pandalangatt Kavu *Spathodea campanulata* P.Beauv., *Cassia fistula* L. and *Aegle marmelos* (L.) Correa. Lowest abundance of *Alstonia scholaris* (L.) R. Br. documented from Thiruvalathur Ayyappan Kavu and Athippattamana Nagakanya Kshethram. In Pathirakunnath Mana lowest abundance of *Adenanthera pavonina* L. is documented Wheareas *Aegle marmelos* (L.) Correa in Cholakkavu Sivakshethram. The survival of the regional forest ecosystems, including sacred groves, is threatened by a variety of development strategies and alterations in the social structure. Sreelekha *et al* (2021).

The vascular flora and phytosociology of Chama Kavu in the Kannur district of Kerala and they reported that *Chassalia curviflora* (Wall. ex Kurz) Thwaites occupied a higher frequency percentage of 70 and that the abundance of

Gmelina arborea Roxb. was highest at three and lowest at *Grewia nervosa* (Lour.) Panigrahi at 0.66. (Shilpa and Anitha, 2016). The present studies from sacred groves shows maximum frequency is displayed by *Caryota urens* L. in Parakkattukavu Bhagavathi Kshethram, *Strychnos nux-vomica* L. in Ethanur Pandalangatt Kavu, *Cassia fistula* L. in Thiruvalathur Ayyappan Kavu, *Borassus flabellifer* L. in Athippattamana Nagakanya Kshethram, *Strychnos nux-vomica* L., and *Terminalia paniculata* Roth., *Macaranga peltata* (Roxb.) Muell.-Arg. in Pathirakunnath Mana and *Mallotus philippensis* (Lam.) Muell.Arg. in Cholakkavu Sivakshethram.

During the phytosociological explorations in Kayyath Nagakavu Kannur District, Kerala State *Asipidopterys canarensis* Dalz., *Connarus paniculatus* Roxb. and *Ixora coccinia* L. have higher frequency value than rest of the species. Lowest frequency was shown by about 33 species. *Scleria lithosperma* (L.) Sw.and *Ageratum conyzoides* L. have distributed abundantly than the other constituent species. Lowest abundance is shown by 14 species. Jeeshna M V *et al.* (2020). Following an exploratory survey in Pathirakunnath Mana Pambum Kavu, which is located in Chalavara Gramapanchayath, Ottapalam taluk of Palakkad district, Kerala state, 86 species belonging to 74 genera and 23 families were discovered. Thirty-one medicinal plants and eight endemic, uncommon, and redlisted plants are included in this list. Praveenkumar and Udayan (2022).

More trees than herbs, shrubs, or climbers can be found in these groves. These have a high biodiversity and include IUCN Red List species in their native vegetation. A keystone species, *Ficus benghalensis* L., was discovered inside the sacred grove at Suriampettai village, Cuddalore district, and it provides a niche for a significant variety of birds and plants. Several relict, endemic, and endangered species have been recorded from the grove (Israel *et al.*, 1997). Similar to this a large *Ficus benghalensis* L. tree is documented from Ekalavyasramam Karuppaswami Kshethram. Many birds and bats find refuge in this keystone species. This opinion was corroborated by a study conducted in 2005 by Jagannathan, which focused on sacred groves and found that these

areas shielded important species like *Ficus religiosa* L. fruit serves as a keystone species, and the grove's biodiversity depends on the preservation of this tree. The peepal tree, *Ficus religiosa* L., is categorized as a "keystone mutualist" for the preservation of tropical biological diversity, according to research by Gilbert (1980) and Terborgh (1986). In India, this species is largely protected (Gadgil, 1987).

Groves are typically found around bodies of water, which are home to a wide variety of plants and animals. This keeps the local water table stable and provides a source of water for both plants and animals. The old practice of gathering water and allocating resources is explained by the stable system in which each town had a temple, a tank, and a sacred grove. (Karunakran *et al*., 2005).

Furness and Greenwood, (1993) documented that the sacred groves with large numbers of butterflies, insects, worms, snakes, and birds. One of the common insect of all habitat types is the butterfly and due to their adaptability to change, its diversity and abundance can serve as indicators of ecological trends in other facets of biodiversity.

Over crowding by invasive weeds such as *Mikania micrantha* Kunth, and *Chromolaena odorata* (L.) King & Robins etc. reduces species diversity and destroys habitat in sacred groves. Researchers Richardson and Rejmanek (2011), Mandal and Joshi (2014), and Cronk and Fuller (1995) examined the growing numbers of alien plant species, including *Lantana camara* L. and *Chromolaena odorata* (L.). King and H. Rob., reported that they are the most pervasive, invasive species worldwide, found in tropical, subtropical, and warm temperate zones. They have also invaded most of the western Himalaya's community and reserve forestlands. Changes in propagule pressure, nutrient and light availability, and not just habitat richness, are brought about by the establishment of invasive species. (Mandal and Joshi, 2015).

Soil erosion is common due to severe rainfall, and the majority of the grove's compound walls were missing. Long-lasting effects of soil erosion are largely caused by water. (Dregne, 1987). Within the sacred groves, soil erosion has a

negative impact on biodiversity and soil fertility. One naturally occurring process that has an adverse effect on biodiversity is soil erosion.

Solid waste pollution including plastic were observed in Nottathe tharavadu naga kavu, Parakkattu Bhagavathi Kshethram, Ekalavyasramam Karuppaswami kshethram and Pilappully Nagakavu. The regular growth of plants and animals was hampered by the dumping of household rubbish and other materials, including plastics, inside the groves. The research conducted by Pinto *et al* (1999) sheds light on the massive global production of plastic debris and its detrimental effects on the ecosystem. In Chirakkal chira, the invasive *Salvinia molesta* was observed to be completely distributed together with Nymphaeae, which causes organic pollution. Around the ponds, exotic plants like *Mikania micrantha* Kunth. and *Chromolaena odorata* (L.) King & Robins were visible. Chirakkalchira's entire water body is abundant with flora, including mushrooms, pteridophytes, algae, and angiosperms. The algae are the most abundant type of flora found in Rajarajeshwara Chira, followed by fungi, pteridophytes, and angiosperms. Archana *et al* (2021).

Establishment of new roads along the sides and parts of sacred groves causes its destruction in some extent, which affects biodiversity locally and regionally. Nottathe tharavadu naga kavu, Parappur nagakavu, Kannadi variyam pambumkavu, Kizhakkekkara tharavattu kavu, Kandaayil kavu, Aakkaparambil sarpakkavu, Puthanpurakkal Tharavadu Veluthankavu are fragmented by roads. By carefully choosing the location of road projects and taking extra care to avoid going through protected areas and other important natural habitats, such as forested regions, the detrimental effects of road projects on biodiversity can be reduced. (George and Paula, 2003). New generations has no ethic in connection with the conservation of sacred groves and converting to some other purposes. The roads constructed inside the groves have a democratizing effect (Eliza, 2010). George and Paula (2003) state that the development and maintenance of roads can occasionally cause the loss and deterioration of biodiversity and natural ecosystems, either directly or indirectly.

Due to the loss of fertilized top soil and sacred groves' natural habitat, land quarrying poses a severe threat to the survival of groves and has a negative impact on biodiversity. According to research by Lameed and Ayodele (2010), the limited natural resources (fauna and flora species) that have been impacted by quarry operations have resulted in a significantly disturbed forest ecosystem in the quarry's unexploited plot in Ogbere.

It has been observed passing of power lines through Cherukad sarpakkavu, Pathirakunnath Mana, Nottathe tharavattu kavu, Parakkattukavu bhagavathi kshethram, Tholanur valiyathodi kavu, Punnakkodu kavu, Kallingal sarpakkavu, Kundupalliyalil sarpakkavu, Azhakappath kavu, Kandayil kavu and Kanndi variyam pambumkavu. It has the opposite effect on the sacred groves' biodiversity. According to research by Bartzke *et al.* (2014), electricity lines release electromagnetic fields, noise, and light. The disturbance caused by electrical lines can impact not just the places directly beneath them but also the surrounding environments. Electric threats were present in Pathirakunnath Mana (Chalavara- Ottapalam taluk), Kallingal kavu (Thachanattukara – Mannarkkad taluk) and Nottathe tharavattu kavu (Peringottukurussy- Alathur taluk).

Sacred groves are being turned into tiny temples due to cultural and traditional belief system changes. Pressures on sacred groves are caused by a variety of reasons, such as demands for natural resources and cultural shifts in Meghalaya Ormsby (2013).

Among the species found inside the sacred groves are native, medicinally significant, and IUCN red-listed plants.

Vateria indica L. an endemic tree species present in Parakkattukavu Bhagavathi Kshethram (Kavassery- Alathur taluk) .Sacred groves play a vital part in the decolonization of numerous species and serve as a species pool (Sashikumar, 2005). The preservation of natural habitat within the sacred groves contributes to biodiversity enhancement and upholds religious and cultural values.

Chapter VII:

IMPACT OF INVASIVE SPECIES ON SACRED GROVES

7.1. Introduction

7.1.1. Definition of Invasive Species

An invasive species refers to a non-native organism that harms or damages the economy, environment, and human health. Invasive species may harm natural resources such as animals and plants, threatening human resource utilization, thereby causing destruction to native plants and animals (Sankar, 2020). The existence of sacred groves in India constitutes a significant part of the hydrologic cycle, believing that trees embody ancestral spirits. They establish customs and rules for protection, prohibiting actions like felling trees and killing animals. Invasive species, also known as pests, destroy natural resources and pose threats to human health and safety.

7.2. Overview of Sacred Groves and Their Significance

Sacred groves in Kerala are dependent on their creators and owners. These forest sections, situated around places of worship, are crucial for biodiversity. They represent natural areas of vegetation specific to particular communities, securing religious beliefs (Sreelekha and Joy, 2021). Some forests play an essential role in protecting animals and plants, which is necessary for the environment. They are integral to human habitats, responsible for conserving water and soil.

Huge losses (US $ million)

Introduced pest	US	India
Weeds		
Crops	27.9	37.8
Pastures	6.0	0.92
Vertebrates		
Crops	1.0	—
Arthropods		
Crops	15.9	16.8
Forests	2.1	—
Plant path		
Crops	23.5	35.5
Forests	2.1	—
Total	78.5	91.02

Species in the US and India

Category	United States		India	
	Total	Alien	Total	Alien
Plants	42,000	25,000	45,000	18,000
Mammals	346	20	316	30
Birds	650	97	1,221	4
Reptiles and amphibians	247	53	741	NA
Fishes (Freshwater)	938	138	2,546	300
Arthropods	650,000	4,500	54,430	1,100
Microbes	134,644	20,000	NA	NA

Figure 15: Invasive Species on Sacred Groves

Sacred groves are significant for preserving biodiversity and conserving species. They serve local communities by providing ecosystem services such as clean air, soil, and water resources. Crucial for religious and cultural practices, these groves host rituals within local communities. They aid in mitigating the effects of climate change by absorbing carbon dioxide from the atmosphere (Rajesh *et al.*, 2020). Additionally, they are essential for medicinal plants and herbs, as well as maintaining soil fertility. Sacred groves contribute to maintaining the natural balance of ecosystems and conserving cultural diversity, crucial for species survival. They serve as vital ecotourism destinations and help mitigate natural disasters. Sacred groves are considered to have a positive impact on the well-being of Kerala's communities.

7.3. Purpose of the Chapter

This chapter aims to discuss the impact of invasive species on sacred groves in the Palakkad district of Kerala state. It will analyze the meaning of invasive species, along with an overview and significance of sacred groves. After discussing the overview and significance, the chapter will evaluate the threats to biodiversity, including examples, characteristics, and mechanisms of invasion and spread of sacred groves (Akil Prasath *et al.*, 2024). The impact of invasive species on native flora and fauna will be discussed, along with their impact on ecosystem function, including the disruption of ecological processes and alteration of habitat structure. Changes in nutrient cycling and soil composition, along with effects on ecosystem resilience and stability, will be analyzed. Furthermore, the chapter will evaluate the cultural and religious significance of sacred groves in local cultures and religions, traditional beliefs and practices, and their ecosystems, as well as the implications of invasive species on cultural heritage and spiritual values.

7.4. Threat to Biodiversity

7.4.1. Biodiversity in Sacred Groves

Sacred groves stand as revered sanctuaries treasured for their profound cultural, religious, and ecological significance. These sections of nature boast remarkable diversity of life and nurturing ecosystems overflowing with vitality and abundance. Sacred groves offer retreat to a variety of plant and animal species characterized by ancient trees, verdant vegetation, and microclimates found nowhere else (Sudhi, 2023). Within these sacred havens, biodiversity flourishes in various forms, encompassing a rich tapestry of flora and fauna. Endemic species, unique to these groves, coexist alongside rare plants and threatened animals, forming intricate webs of life. Each species plays an important role in the intricate balance of the ecosystem, contributing to its resilience and sustainability.

The lush vegetation of sacred groves provides habitats for a diverse array of plant species, ranging from tall trees to delicate ferns. These plants serve as the foundation of the ecosystem, providing food, shelter, and resources for countless animal species (Chandel, 2022). The groves teem with life, from the smallest insects to majestic birds and elusive mammals, with each species adding to the tapestry of biodiversity. Some exotic edible fruit yeilding plant species found in sacred groves are “White Pear, Mandarin, Bruisewort, Garden Violet, Lac tree and Elm”etc. Sacred groves hold deep cultural and religious importance for surrounding communities, beyond their ecological significance. These ancient forests are woven into the fabric of local traditions, serving as sacred sites for ceremonies, rituals, and spiritual practices. The groves represent the inherited regard and admiration for nature that has been passed down through the ages. There are 475 species of birds, 100 species of mammals, 156 species of reptiles, 91 species of amphibians, 196 species of fish, and 150 species of butterflies in the groves. Approximately 800 species of angiosperms can be found in the groves; 40% are rare and endangered, and 19% are therapeutic. (Franz, 1999).

7.5. Examples of Invasive Species and Their Characteristics

Invasive species are introduced from distant lands, posing a critical threat to the delicate balance of biodiversity within sacred groves (Van *et al*., 2020). These aggressive attackers displace native flora and fauna, disrupt ecosystems, and cause ecological imbalances. Some invasive species include:

1. *Lantana camara* L.: This shrubby plant is known for its rapid growth and dense thickets. *Lantana camara* L. spreads quickly, choking out native vegetation and altering habitat structure. It bears vibrant clusters of flowers ranging from pink to orange (Chen *et al*., 2022).

2. *Ponteria crassipes* Mart. (Water Hyacinth): Water hyacinth is a free-floating aquatic plant with glossy green leaves and lavender flowers. It has a productive growth rate and the ability to form dense mats on the water surface, hampering sunlight penetration, disrupting nutrient cycling, and degrading water quality (Mateo-Tomás and López-Bao, 2022).

3. *Chromolaena odorata* (L.) King & H. Rob. (Siam Weed): Siam weed is a fast-growing shrub with wavy leaves and small white flowers. Its allelopathic properties prevent the growth of native plants, leading to reduced biodiversity and habitat degradation (Team, 2024).

4. *Mikania micrantha* Kunth (Mile-a-Minute Vine): This aggressive vine rapidly covers open spaces, smothering native vegetation. *Mikania micrantha* Kunth forms dense thickets and features heart-shaped leaves and white flowers, impacting forest regeneration and disrupting ecological processes (Bora and Babu, 2021).

Other examples of invasive species include black rats, cane toad, European starling, Kudzu, Small Indian mongoose, Northern Pacific seastar, and Senna spectabilis. Senna spectabilis, in particular, is proliferating uncontrollably in the forest sections of the Nilgiri Biosphere Reserve (NBR), which includes the Wayanad Wildlife Sanctuary. The Kerala government plans to curb this growth. Due to their rapid development, prolific reproduction, and lack of natural

predators, these invasive species outcompete local flora and wildlife, dominating entire ecosystems. Immediate management actions are necessary to halt their spread and mitigate the harm they inflict on the biodiversity of sacred groves.

7.6. Mechanisms of Invasion and Spread

Various mechanisms contribute to the spread of invasive species within sacred groves. It is crucial to understand these underlying mechanisms to mitigate their impact.

Introduction via Human Activities: The most common and primary mechanisms of invasion are through human-mediated activities, including trade, transportation, and horticulture. Invasive species are inadvertently introduced into the environment through contaminated imported items, soil, or packaging materials. Invasive insects may travel on cargo shipments, while the seeds of invasive plants may hitchhike on cars or machinery (Eyer *et al.*, 2021).

Escape from Cultivation: Some invasive species are initially introduced for ornamental or agricultural purposes and may escape cultivation, establishing self-sustaining populations in natural habitats. If not properly managed, garden plants and ornamentals can become invasive, rapidly spreading into surrounding areas. Exotic ornamental plants may produce seeds dispersed by wind, water, or animals, leading to colonization of nearby ecosystems (Beaury *et al.*, 2021).

Natural Dispersal Mechanisms: Invasive species also spread through natural dispersal mechanisms, including wind, water, and animal vectors. Seeds of invasive plants may be dispersed over long distances by wind or water currents, enabling them to establish new habitats far from their point of origin. Animals may transport seeds of invasive species through their fur, feathers, or digestive tracts, further facilitating their spread to new locations.

High Reproductive Capacity: Many invasive species possess high reproductive capacities, allowing them to produce large numbers of offspring and quickly

establish in new areas. Invasive plants may produce abundant seeds or vegetative propagules, while invasive animals may outcompete native species for resources (Martinez *et al.*, 2020).

Adaptations to Disturbed Habitats: Invasive species exhibit traits that enable them to thrive in disturbed or degraded habitats, giving them competitive advantages over native species. These species may tolerate a wide range of soil conditions, grow rapidly in open spaces, or exhibit allelopathic effects. They thrive in environments altered by human activities such as deforestation, urbanization, or agriculture (Baard, 2021).

7.7. Impact of Invasive Species on Native Flora and Fauna

Invasive species pose significant threats to native flora and fauna within sacred groves, disrupting ecological balance and creating hazards for the survival of indigenous flowers and animals (Sero *et al.*, 202). Their impact extends across diverse ranges of the atmosphere, leading to biodiversity loss, habitat degradation, and altered ecosystem functions.

Competition for Resources: Invasive species outcompete native flora for essential resources such as light, water, nutrients, and space. They exhibit aggressive growth patterns, rapid reproduction rates, and lack natural predators or diseases to control their population. Dense monocultures created by invasive plants can reduce biodiversity and deprive local species of vital resources needed for growth and reproduction (Rai and Singh, 2020).

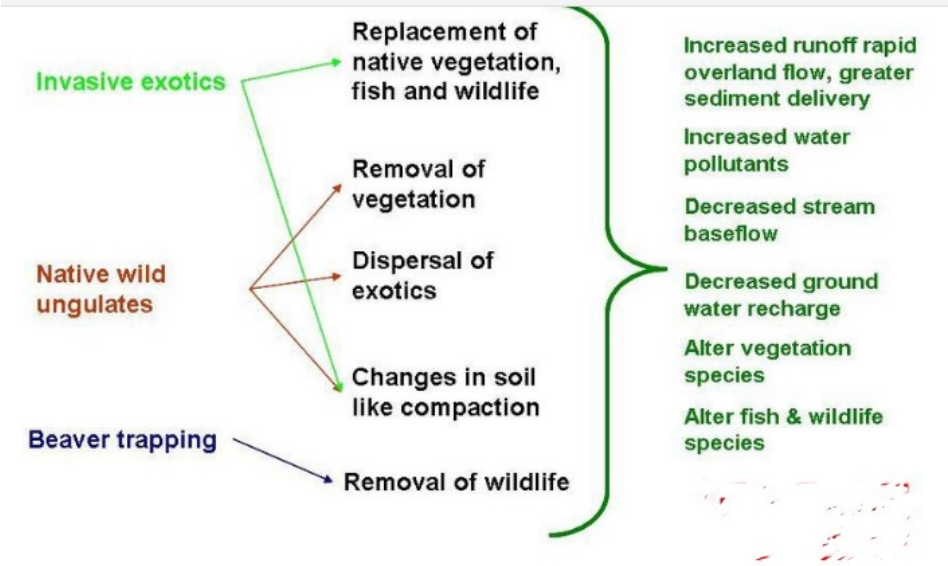

Figure 16: Direct and indirect impacts

Altered Habitat Structure: The establishment of invasive plants can alter the physical structure and composition of habitats within sacred groves. These alterations in habitat structure can disrupt ecological processes (Jing *et al.*, 2021), such as nutrient cycling, soil erosion control, and water retention. Additionally, they impact local flora and fauna.

Changes in Species Composition: Invasive species can induce shifts in species composition and diversity within sacred groves by displacing native plants and disrupting ecological relationships. Native vegetation adapted to specific environmental conditions may be unable to compete with invasive species (Milanović *et al.*, 2020). These threats can lead to declines or extinctions of indigenous plant species. Changes in plant communities can affect habitat suitability for native fauna, resulting in reduced food availability, nesting sites, and shelter.

Loss of Genetic Diversity: Invasive plants may hybridize with native species, leading to genetic introgression and dilution of unique genetic traits (Nisar *et al.*, 2021). This loss of genetic diversity can reduce the resilience of native plants to environmental stressors such as climate change, pests, and diseases, making them more susceptible to extinction.

Disruption of Ecological Relationships: Invasive plants may alter pollination patterns, seed dispersal mechanisms, or herbivore rates, affecting the reproductive success and survival of native plants (Emery-Butcher *et al.*, 2020). Changes in vegetation structure and composition can impact habitat suitability for native wildlife species, leading to declines in population distribution.

Increased Vulnerability to Disturbances: Sacred groves occupied by exotic species may become more susceptible to natural disturbances such as wildfires, droughts, or pest outbreaks. Invasive plants may create conditions that increase the intensity or frequency of disturbances (Khan *et al.*, 2021), making it challenging for native flora and fauna to recover.

Invasive species can alter the food web in an ecosystem by destroying or replacing native food sources. Wildlife may not find much nutritional value in invasive species. Direct hazards posed by invasive species include killing or preventing the reproduction of native species' offspring, preying on native species, outcompeting native species for food or other resources, and creating or carrying diseases (Invasive species, 2024). The diversity of native flora in India's national parks is significantly declining due to certain invasive species, such as Lantana camara. When native predators attempt to consume cane toads, they are harmed by the bacteria secreted by their skin. Up to 42% of endangered species may be threatened by invasive species.

7.8. Impact on Ecosystem Function

7.8.1. Disruption of Ecological Processes

Invasive species pose significant threats to native ecosystems in Kerala, surpassing native species for important resources and disturbing ecosystem health and biodiversity. The mechanisms of invasive species also alter ecological processes crucial for effective management (Rasheed *et al.*, 2021). The primary aim of invasive species is to disrupt ecological processes. Invasive plants have rapid growth rates and high seed production rates, allowing them to outcompete native species for access to sunlight, leading to changes in plant

community structure and composition and altering resource availability for other organisms in the environment. Invasive species also impact nutrient cycling, a fundamental process in ecosystems, by altering the composition of plant communities and habitat structure.

Rank	Description
High	Species represents a severe threat to native species and ecological communities
Medium	Species represents moderate threat to native species and ecological communities
Low	Species represents a significant but relatively low threat to native species and ecological communities
Insignificant	Species represents an insignificant threat to native species and ecological communities

Figure 17: Rank wise invasive species' description

Invasive species also affect nutrient composition rates and the total decomposition process. Some invasive plants are used to modify soil nutrient levels (Amritha and Varunprasath, 2022), creating effects on other organisms dependent on ecosystem nutrient availability. Invasive species disrupt important ecological interactions such as pollination and seed germination spread over the area. Invasive plants compete with native species for pollinators, reducing the reproductive success of native plants and resulting in a decline in plant diversity. Invasive species produce seeds that spread over large areas, allowing for the spread of seeds and increased growth of native species. Disruption in ecological processes also affects invasive species, impacting ecosystem structure and function. Changes in plant communities also alter habitat suitability for other organisms in the ecosystem (Padua *et al.*, 2023). Shifts in animal populations and changes in trophic interactions are also important aspects of a balanced ecosystem.

The loss of native plant species also impacts the ecosystem of Kerala, reducing food resources for herbivores in the Palakkad District and affecting the ecosystems they inhabit. Effective management strategies for invasive species require various approaches that address both the symptoms and the root causes of invasion, including early detection processes and habitat restoration. The characteristics of invasive species sometimes disrupt ecological processes.

7.9. Alteration of Habitat Structure

The alteration of habitat structure depends on the invasive species confronting the ecological challenge, with implications for native biodiversity and ecosystem functioning (Padmakumar and Shanthakumar, 2024). Invasive species can modify the physical structure of habitats, making it crucial to understand these alterations for effective management strategies impacting the ecosystem. Dense forests of invasive plants are significant in creating balance within the ecosystem, improving native vegetation and land form. Various cultures shape the ecosystem's structure, reducing plant species diversity and creating suitable environments for habitat inhabitants. However, a loss of habitat complexity occurs when habitat alteration transpires, impacting the microclimatic conditions of Palakkad District's ecosystems.

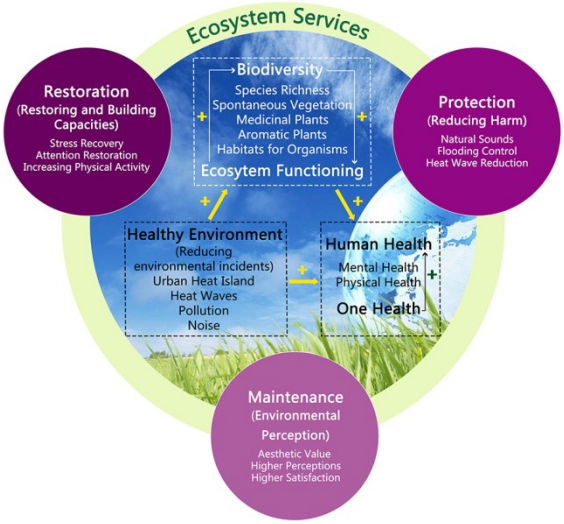

Figure 18: Biodiversity, ecosystem functions and services

Dense forests of invasive plants also impede light penetration, alter wind patterns, and influence temperature (Kumar and Kunhamu, 2021), creating microclimatic conditions distinct from native habitats. These changes affect species distribution and abundance, altering habitats adapted to specific environmental conditions and showcasing ecosystem diversity. Invasive species also modify resource availability, such as water and nutrients, shaping the ecosystem to sustain each species. Moreover, invasive plants reduce soil moisture by consuming water, resulting in less favorable conditions for native vegetation (Panikkar *et al.*, 2021). They also compete for and control nutrient resources, altering soil composition and affecting ecosystem functioning.

The growth and survival of native species are influenced by alterations in nutrient cycling processes crucial for Kerala's ecosystem. Changes in habitat structure caused by invasive species further affect ecosystems, improving soil quality and promoting other plants' growth (Jones *et al.*, 2023). These alterations in soil composition and nutrient availability are linked to nutrient cycling processes and soil stability, impacting native biodiversity and ecosystem functions.

7.10. Changes in Nutrient Cycling and Soil Composition

Changes in nutrient cycling and soil composition induced by invasive species represent significant ecological consequences affecting ecosystem functioning and biodiversity conservation (Arasumani *et al.*, 2021). Invasive species alter nutrient cycling processes, affecting ecosystems and associated species. Soil composition and nutrient availability are vital for plant growth, requiring effective management strategies to mitigate invasive species impacts on ecosystems. Invasive species aim to influence nutrient cycling, with some species, like invasive leguminous plants such as Acacia and Mimosa, known for their nitrogen-fixing capabilities. These species convert atmospheric nitrogen into forms utilized by plants, increasing nitrogen levels in the soil, thereby affecting nutrient cycling processes and native plant growth.

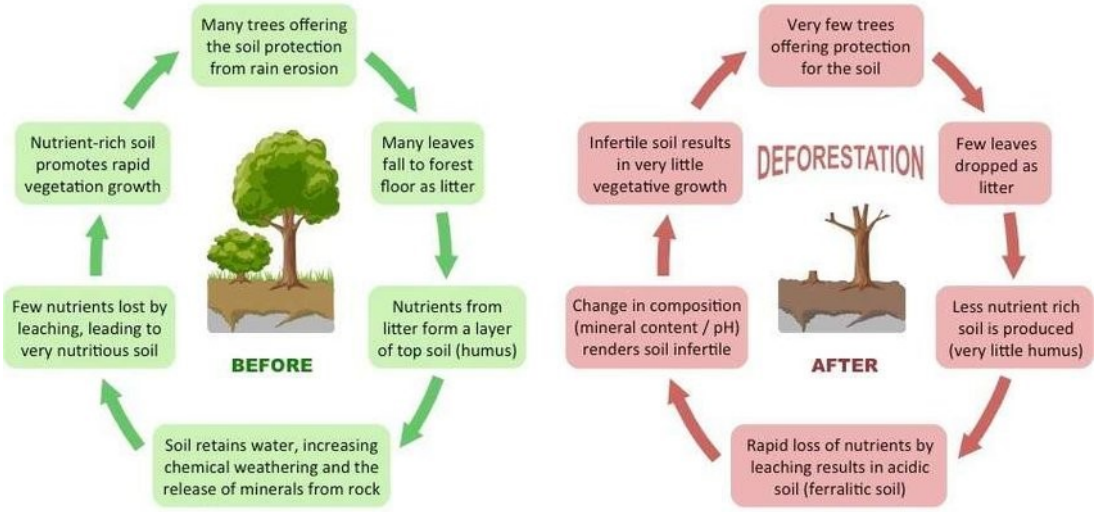

Figure 19: The Effect of Deforestation on Nutrient Cycling Source

Alterations in soil composition and nutrient availability, particularly by invasive leguminous plants, impact nutrient cycling, influencing native plant growth and competitive interactions in Kerala (Singh *et al.*, 2021). Changes in nutrient cycling and soil composition also affect the distribution of organisms across trophic levels, highlighting significant ecological disturbances related to ecosystem functioning. Effective management strategies for invasive species are crucial for nutrient cycling's role in maintaining ecosystem stability.

7.11. Effects on Ecosystem Resilience and Stability

The effects of invasive species on ecosystems impact biodiversity conservation and ecosystem management, influencing resilience and stability (Nair *et al.*, 2021). Invasive species diminish ecosystem resilience, as excessive resilience reduces biodiversity. They compete with native species for resources like light, water, and nutrients, reducing native species richness and diversity.

Loss of biodiversity weakens ecosystem capacity and creates disturbances, underscoring the importance of biodiversity in providing resilience to environmental change (Menon *et al.*, 2020). Invasive species increase ecosystem vulnerability, making ecosystems susceptible to extreme weather events and acting as hosts for pathogens and parasites, facilitating disease spread among native species. They also alter habitat structure and soil composition, favoring

proliferation and exacerbating extreme weather impacts (Sreelekshmi *et al.*, 2022).

Reductions in ecosystem resilience and stability affect ecosystem service provision, compromising services like clean air, water, pollination, and climate regulation vital for human societies' support (Sreelekshmi *et al.*, 2022). Early detection and rapid response strategies are crucial for biological control, promoting public awareness to maintain ecosystem stability. These strategies mitigate invasive species' impacts, improving ecosystem resilience and stability, and ensuring the delivery of essential ecosystem services supporting human health and livelihoods.

7.12. Cultural and Religious Significance

The cultural and religious significance of sacred groves extends beyond ecological values, playing a crucial role in the identity of local communities. Understanding this cultural and religious significance is impactful for addressing invasive species found in these ecosystems.

7.13. Importance of Sacred Groves in Local Cultures and Religions

Sacred groves in Kerala represent more than just patches of land; they are intertwined with cultural and religious aspects, associated with living creatures (Balasubramanian *et al.*, 2024). Local cultures are deeply connected with these groves, serving as sanctuaries for spiritual rituals. Rituals, ceremonies, and festivals held in sacred groves reflect traditions that foster communal solidarity, emphasizing the importance of every element within the ecosystem. These groves also encapsulate traditional ecological knowledge, guiding land management practices and biodiversity conservation strategies.

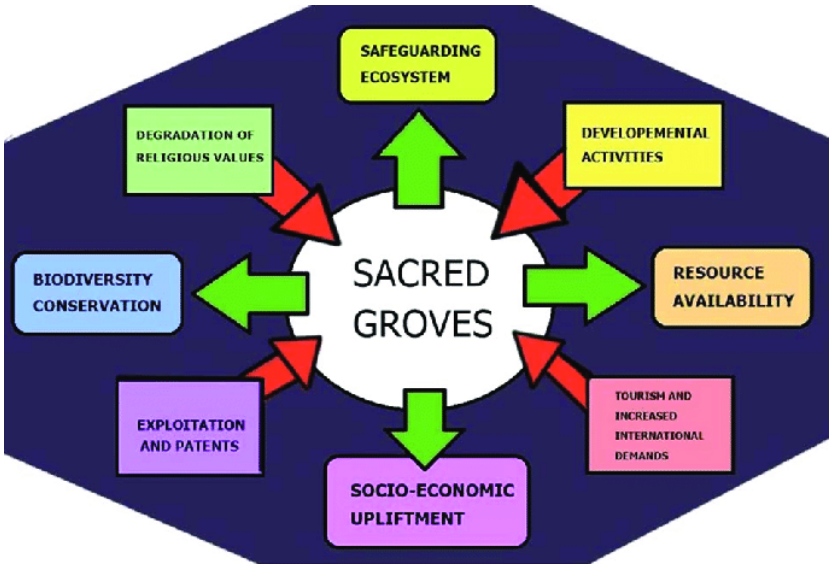

Figure 20: Role of sacred groves

Local communities demonstrate a profound understanding of the relationship between humans and nature, passed down through generations. Sacred groves serve as spaces where cultural heritage is preserved, promoting community cohesion and social activity. Preservation of these groves is vital for maintaining ecological balance and safeguarding cultural and spiritual values.

7.14. Traditional Beliefs and Practices Associated with Sacred Groves

Traditional beliefs and practices within sacred groves reflect the deep connections between humans and nature, with various communities practicing rituals specific to their culture (Lakshmi *et al.*, 2021). These rituals, often involving offerings of food and flowers, symbolize gratitude and respect for nature's gifts. Sacred groves serve as hubs for community gatherings and cultural performances, fostering knowledge transmission and celebrating cultural heritage. The rhythmic life guided by ancient traditions highlights the importance of preserving these groves for ecological conservation and cultural continuity.

7.15. Implications of Invasive Species on Cultural Heritage and Spiritual Values

The intrusion of invasive species into sacred groves disrupts traditional practices and threatens cultural heritage (Faisal, 2023). These species alter vegetation composition and degrade the aesthetic and spiritual qualities of the ecosystem, hindering the performance of religious rituals and ceremonies. Invasive plants transform sacred landscapes into degraded habitats, compromising their integrity and disrupting community cohesion. Preserving the importance of sacred groves requires integrated management approaches that prioritize both ecological restoration and cultural heritage conservation.

7.16. Conclusion

Sacred groves in Palakkad District hold immense cultural, religious, and ecological significance, serving as vital habitats and cultural sanctuaries. These groves face threats from invasive species, disrupting traditional practices and compromising their cultural and spiritual values. Conservation and management efforts must consider both ecological and cultural aspects, engaging local communities in preservation initiatives and implementing strategies to control invasive species. Future research should focus on long-term monitoring of invasive species and innovative approaches integrating traditional ecological knowledge with modern conservation practices to ensure the resilience and sustainability of sacred groves for future generations.

Chapter VIII

IMPACT OF INTRODUCED SPECIES ON SACRED GROVES

8.1. Introduction

8.1.1. Definition of introduced species

Introduced species refer to non-native organisms introduced to a new area, also known as exotic species, which may or may not be harmful to their new habitat. These organisms play a role in global change and influence various efforts in specific contexts, such as policy analysis. Understanding introduced species is crucial for identifying new invasions and assessing their environmental and economic costs. The growth of introduced species can lead to resource competition and affect the growth of native species in sacred groves in Kerala.

8.2. Differentiation from invasive species

Introduced species differ from invasive species in that introduced species are non-native organisms introduced to an environment, which may or may not be harmful, while invasive species are non-native species that disrupt ecosystems in their new habitat. Introduced species encompass both invasive species and beneficial organisms, whereas invasive species specifically refer to harmful introduced species. Introduced species may be intentionally or accidentally introduced, while invasive species are characterized by their destructive impact on the local environment. Both introduced and invasive species are distinguished by their environmental impact.

8.3. Overview of sacred groves and their ecological significance

Sacred groves are forested areas protected by local communities through traditional rituals and religious beliefs, preserving biodiversity and mitigating threats from modernization and urbanization. They hold the responsibility of safeguarding natural resources and play a crucial role in biodiversity conservation in Kerala.

8.4. The ecological significance of sacred groves in Kerala

Sacred groves serve as vital ecosystems providing protection for natural resources and comprising a unique network of ecological landscapes

intertwined with the culture and life of local communities. Religious practices within sacred groves contribute to maintaining ecological balance, with sociologically recognized "sacred species" influencing biodiversity and ecological processes essential for human survival and the well-being of flora and fauna. Ecological studies of sacred groves reveal distinct characteristics, including diverse plant tiers, cultivated plants, and their associated ecological functions, contributing to the overall health and stability of the ecosystem in Kerala.

8.5. Potential Benefits

8.5.1. Introduction to introduced species and their potential benefits

Introduced species encompass organisms introduced beyond their native habitats, impacting ecosystems and community dynamics. They are introduced through various means, including human activities like trade and travel, and can serve as agents of change within ecosystems, positively influencing community dynamics and ecosystem processes. Some introduced species provide benefits such as enhancing visual appeal and diversity in urban landscapes, improving crop yields, increasing productivity in forests, and supporting recreational activities like fishing and hunting.

8.6. Examples of introduced species used in sacred groves

Sacred groves in Kerala incorporate introduced species into cultural and religious practices due to their perceived benefits. These species, though not native to the ecosystems, play significant roles in rituals and traditions related to biodiversity conservation.

Lantana camara L.: Celebrated for its flavourful flowers, *Lantana camara* L.is used for decoration in ceremonial places within sacred groves and possesses medicinal properties used in traditional medicine systems for treating skin infections.

Chromolaena odorata (L.) King & H. Rob.: Found in parts of Kerala, *Chromolaena odorata* (L.) King & H. Rob.contributes to sacred groves by providing shade,

habitat for wildlife, and contributing to soil stabilization, thus delaying soil erosion.

Mikania micrantha Kunth, commonly referred to as mile-a-minute weed, is a species found in sacred groves, particularly in areas prone to soil erosion. These species play an important role in vegetation and soil improvement, providing habitat for small animals and contributing to the biodiversity of sacred grove ecosystems.

8.7. Positive Impacts on Biodiversity, Ecosystem Services, and Cultural Practices

Introduced species in sacred groves have numerous positive impacts on biodiversity, ecosystem services, and cultural practices. They enhance resilience and significance to local communities by increasing biodiversity and providing proper habitat and resources for native flora and fauna (Tatay and Merino, 2023). Introduced species offer valuable ecosystem services, such as soil stabilization, and contribute to the stability of sacred grove ecosystems.

8.8. Ecological Risks

The introduction of invasive species poses significant ecological risks to native flora, fauna, and ecosystems. Invasive species have the potential to disrupt ecosystems, drive native organisms to extinction, lower biodiversity, and alter soil composition and physical properties (Probert *et al.*, 2020). Various methods, including ballast water, can inadvertently transfer invasive species into new regions, posing risks to native ecosystems.

8.9. Examples of Introduced Species That Have Become Invasive

Examples of introduced species that have become invasive include the water hyacinth (*Ponteria crassipes* Mart.) and the cane toad (*Rhinella marina*). These species, originally introduced for pest control, have rapidly spread and negatively impacted native ecosystems, highlighting the importance of thorough risk assessment and management plans (Raj *et al.*, 2021).

8.10. Potential Negative Impacts on Native Flora, Fauna, and Ecosystems

The introduction of invasive species may have negative impacts on native ecosystems, including competition for essential resources, alteration of habitat structure, and disruption of ecological interactions and processes (Santhi *et al.*, 2023). This can lead to decreases in native plant diversity, population losses in native fauna, and changes in ecosystem dynamics.

8.11. Cultural and Religious Significance

The introduction of species into sacred groves holds cultural significance in many communities, symbolizing a relationship between people and nature rooted in spirituality and tradition. While some view the introduction of non-native species as enhancing the sanctity and cultural traditions of sacred groves, others perceive it as a violation of cultural standards and a disturbance of the natural order (Falcón *et al.*, 2020). Balancing conservation efforts with cultural values is crucial in managing invasive species and protecting the ecology and cultural significance of sacred groves for future generations.

8.12. Traditional Practices Involving Introduced Species

In sacred groves, humans have embraced customs involving invasive species, often driven by practical or symbolic reasons (Siddiqui *et al.*, 2021). Exotic plant species are cultivated in sacred groves for their therapeutic properties and as offerings in religious rituals, highlighting the cultural relevance of introduced species. Communities recognize the medicinal and symbolic value of these plants, reaffirming their connection to the natural world and enhancing the spiritual atmosphere of the groves. Some introduced animal species also play important roles in customary ceremonies and rituals, symbolizing divine messengers or fertility symbols. Purposefully introducing and protecting certain species in sacred areas demonstrates a conscious effort to uphold the spiritual bond between people and the natural world, while also showing respect for biodiversity. These customs demonstrate adaptive interactions between humans

and invasive species, deeply rooted in spiritual beliefs and cultural heritage, and support the persistence of cultural traditions over generations.

8.13. Implications for Cultural Heritage and Spiritual Values

The introduction of new species significantly impacts the cultural and spiritual values of sacred groves, affecting the complex interrelationship between the natural environment and humanity. Rituals involving exotic species can enhance the cultural identity of surrounding communities, fostering a sense of connection to both native and non-native elements of the environment. By integrating introduced species into cultural traditions, sacred landscapes' spiritual importance is upheld, honoring the diversity of biological forms. However, the proliferation of invasive species threatens the preservation of spiritual values and cultural heritage in sacred groves by disrupting conventional practices, degrading ecosystems, and endangering culturally significant species. Over time, invasive species may diminish the spiritual and cultural significance of sacred places by compromising their natural integrity.

8.14. Responsible Introduction Practices

Principles of responsible species introduction guide the promotion of ecological integrity, cultural preservation, and community well-being in sacred groves. These principles emphasize precaution, collaboration, and adaptability in introducing species into sacred landscapes.

Precautionary Measures: Responsible species introduction begins with taking appropriate precautions to minimize risks, including conducting thorough risk assessments to evaluate potential impacts on the environment and cultural significance (Dhar *et al.*, 2020). Practitioners carefully consider ecological traits, invasion potential, and compatibility with existing flora and fauna when introducing species, identifying possible hazards and developing plans to mitigate unforeseen consequences.

Collaboration: Collaboration among diverse stakeholders, including conservationists, cultural practitioners, local communities, and indigenous

knowledge holders, is essential for ensuring responsible species introduction (Manna and Roy, 2021). By integrating scientific knowledge with cultural perspectives, stakeholders can develop inclusive, culturally sensitive, and ecologically sustainable species introduction strategies aligned with regional interests and values.

Adaptability: Acknowledging the dynamic and complex nature of ecosystems, practitioners must remain adaptable to changing environmental and sociocultural conditions (Parvathy, 2023). Monitoring the effectiveness of introduced species over time, adjusting management plans as needed, and learning from both successes and failures are crucial for guiding future actions and maintaining ecological integrity, cultural preservation, and community well-being in sacred groves.

By adhering to these principles, practitioners can support the preservation of biodiversity, cultural heritage, and sustainable livelihoods in sacred groves, ensuring the long-term survival and well-being of current and future generations.

8.15. Guidelines for Selecting and Introducing Species into Sacred Groves

Guidelines based on ecological and cultural factors are used to select and introduce species into sacred groves. Priority should be given to native or non-invasive species to preserve the current plant and animal groups in the ecosystem. Species with cultural importance or traditional usage provide value to local communities.

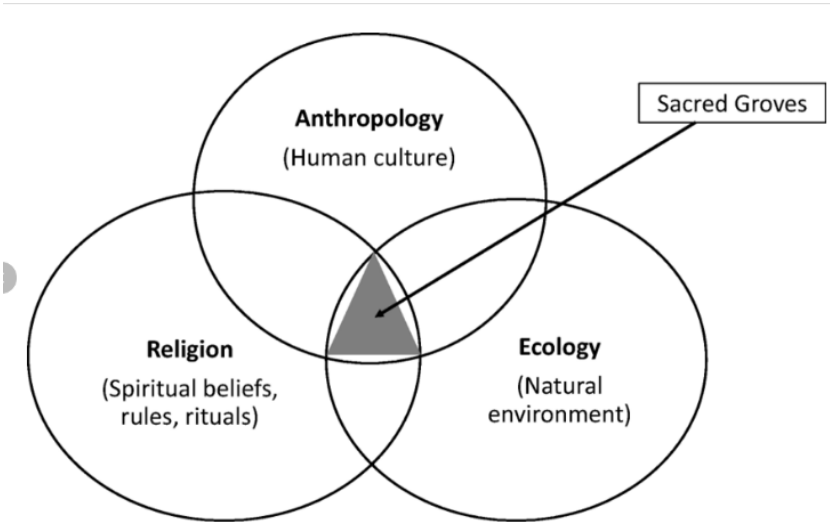

Figure 21: Species into sacred groves

These guidelines are typically prioritized, with practitioners conducting assessments to determine the species' effect on native biodiversity, ecosystem function, and cultural significance. This involves incorporating historical and traditional knowledge of the area and consulting with local communities (Sharma and Kumar, 2021). By minimizing risks and aligning judgments with local priorities, practitioners can reduce ecological and cultural risks during the introduction phase. This includes selecting suitable propagation techniques to ensure successful establishment of the species, preserving genetic diversity, and implementing monitoring and management procedures to swiftly address any unforeseen effects.

Practitioners can successfully introduce species into sacred groves, supporting ecological integrity, cultural preservation, and community well-being. These recommendations provide a framework for conscientious species introduction procedures that respect the revered environment and promote harmony between people and nature.

8.16. Considerations for Mitigating Ecological and Cultural Risks

Mitigating ecological and cultural risks resulting from the introduction of new species requires a deliberate and comprehensive strategy involving attentive planning, close observation, and adaptive management techniques.

Practitioners should prioritize the introduction of species with minimal invasive potential to reduce ecological hazards (Hansepi, 2023). Regular monitoring of introduced populations can help lower the chance of ecological disturbance and maintain the integrity of the sacred grove ecosystem.

Cultural significance and potential effects on customs and beliefs must also be considered when introducing species (Sumesh and Sudhikumar, 2020). Consulting cultural leaders and local communities can provide valuable insights into the cultural significance of introduced species and help identify potential conflicts or issues. Transparent communication and cooperative decision-making procedures with community members are essential to resolve conflicts between conservation objectives and customs (Blakeney *et al.*, 2020). By actively including local populations in decision-making processes, practitioners can establish mutual understanding and develop socially and culturally inclusive management methods.

Staying alert and flexible in the face of new ecological and cultural issues is important for practitioners, who may need to modify management techniques as necessary (Pradheep *et al.*, 2021). Consistent communication and collaboration with local stakeholders can help practitioners effectively handle new ecological and cultural threats, advancing the long-term sustainability of sacred groves as significant ecological and cultural landscapes for future generations.

8.17. Conclusion

The investigation into introducing new species into sacred groves underscores the delicate balance between ecological preservation and cultural preservation. Practitioners can cultivate sustainable management methods that respect the sacredness of these landscapes while advancing biodiversity conservation and community well-being. It has become evident that sacred groves are important both ecologically and culturally, and the introduction of new species into these sacred areas may have profound impacts on environmental dynamics, cultural customs, and biodiversity.

Ethical species introduction and management practices, working with local communities, and maintaining flexibility in the face of shifting environmental and socio-cultural conditions are essential to maintaining a balance between ecological protection and cultural preservation in sacred groves.

8.18. Recommendations

Prioritizing native and non-invasive species is crucial for promoting sustainable management of introduced species in sacred groves (Floerl *et al.*, 2021). Involving local people, cultural workers, and indigenous knowledge holders in all stages of species introduction and management ensures that management strategies align with community interests and values. Establishing standards for monitoring and management helps practitioners swiftly address any unforeseen repercussions (Nayeef Muhammed and Balachandran, 2021). Practitioners must continue to be flexible and modify management techniques as necessary to reduce risks and advance long-term sustainability. Resolving conflicts between cultural practices and conservation goals requires transparent communication and cooperative decision-making procedures with local stakeholders (Nair, 2022).

Chapter IX

SUMMARY

In many regions of the world, sacred groves - also referred to as sacred groves or temple forests - have great cultural, ecological, and spiritual significance. These protected areas, which are spread throughout Kerala, India, are valued for their enormous cultural and religious significance in addition to their biodiversity and ecological benefits (Ntiamoa-Baidu, 2008).Local communities have protected these woodlands by enforcing a number of taboos and limitations in accordance with their beliefs. Sacred groves are significant component of biological diversity biological diversity and abundance in both plants and animals

The sacred groves in the Palakkad area are extremely important from a cultural, ecological, and spiritual standpoint. Local communities use a combination of taboos, limitations, and traditional beliefs to maintain these groves. These groves represent the last remaining intact forest sections in a landscape severely damaged by human activities like agriculture and deforestation, their preservation is imperative. Numerous species of plants and animals, many of which are indigenous and endangered, can be found in these sacred groves. These groves provide a home for a variety of species and contribute to the region's biodiversity preservation. Furthermore, the local community revere the sacred groves and frequently identify them with spirits or deities. Furthermore, these groves are essential for the provision of ecosystem services including water and air purification.

To protect the environment, the local communities that surround these woods have imposed customs and taboos. Numerous species that are exploited in other parts of the region have been protected in part by these taboos and beliefs. These groves' existence has made it possible to maintain and advance the use of traditional herbal therapy. Thousands of therapeutic plants, including lesser-known ones, can be found in these sacred groves.

Sacred groves are important repositories of biodiversity and play a vital role in conserving plant and animal life. They are not legally protected, but are conserved by local communities based on informal preservation practices. Well-preserved sacred groves serve as repositories for economically and medicinally

important plant species and provide refuge for IUCN red-listed species. Their sanctity, religious beliefs, and regulations play a crucial role in conserving the region's flora.

From 70 sacred groves a sum of 529 species belongs to 377 genera and 115 families were identified, listed and herbaria were prepared with available specimens. Fabaceae with *Abrus precatorius* L., *Alysicarpus vaginalis* (L.) DC., *Pterocarpus marsupium* Roxb.etc. shows the dominant family from the 70 sacred groves investigated. The flora of sacred groves in Palakkad district include 181 (34.21%) herbs, 119 (22.49%) shrubs, 74 (13.98%) climbers and 155 (29.30%) trees. The significance of flora and biodiversity inside the groves were studied. Greatest diversity documented from Athippattamana Nagakanya Kshethram (59 families, 72 genera and 96 species) minimum diversity observed in Punnakkodu Naga Kshethram represents only 11 species.

During the investigation period, the sacred grove locations in the Palakkad district were located and noted. The investigation was performed in 70 sacred groves falling under six taluks (Alathur, Chittur, Palakkad, Mannarkkad, Ottapalam and Pattambi) of Palakkad district. Data on the vegetation was gathered during visits to the groves throughout the year.

Out of 529 species 28 Red-listed species were identified in which six species are endangered, 11 species are vulnerable, eight species are near threatened one species are least concern and two species are data deficient. Besides this IUCN category, 39 endemic plant species were also present inside the groves. (Ravikumar *et al*., 2000).

Three parasitic plant species were recorded: two stem parasites, *Dendrophthoe falcata* (L.f.) Ettingsh. and *Helicanthes elastica* (Desr.) Danser, and one root parasite, *Aeginetia indica* L.

Significantly, many plant species within the Palakkad sacred grove are employed in various medicinal systems. Around 57.27% (303) of plants within the forests possess medicinal value and are used to treat diverse ailments such as fever, itching, colds, coughs, and more. Notably, plants like *Alysicarpus*

vaginalis (L.) DC., *Couroupita guianensis* Aubl.et, and *Cynanchum callialatum* Ham. ex Wight found in these forests are reported to have anticancer properties.

When examining diversity indices, High Simpson's index in Ethanur Pandalangatt Kavu (0.909) and lowest in Athippattamana Nagakanya Kshethram (0.889) therefor species diversity maximum in Athippattamana Nagakanya Kshethram.

Phytosociological investigations were performed in six selected sacred groves such as, Parakkattukavu Bhagavathi Kshethram (Kavassery, Alathur taluk), Ethanur Pandalangatt Kavu (Koduvayur, Chittur taluk), Thiruvalathur Ayyappankavu (Kodumbu, Palakkad taluk), Athippatta Mana Nagakanya Kshethram (Thachanattukara, Mannarkkad taluk), Pathirakunnath Mana (Chalavara, Ottapalam taluk) and Cholakkavu Siva Kshethram (Thiruvegappura, Pattambi), have comparatively large areas, rich biodiversity and entry inside the groves was moderately restricted.

Highest Shannon Wiener index is in Parakkattukavu Bhagavathi Kshethram (2.396). The Shannon Wiener index indicates that there are more unique species existing in Parakkattukavu Bhagavathi Kshethram and more diverse species in Athippattamana Nagakanya Kshethram.

Sacred groves, or Sarpa Kavu, are linked to a number of ceremonies that serve to meet our needs, such as banishing Sarpa Dosham and preventing a variety of illnesses, primarily vitiligo, psoriasis, and leprosy. They held the belief that Prasadam oil could heal skin conditions and illnesses brought on by the curse of snakes. Sarpam thullal is very common among western areas of Palakkad.Whereas ‘noorumpalum’ and ‘sarpabali’ are very common in all areas.

Plant species are inseparable from their habitats. They provide sustenance and essential resources for living beings, engaging in vital ecological interactions. Habitats vary in terms of plant species diversity and types, facing varying degrees of pressure. Threats to sacred groves include shifts in belief systems,

invasive species proliferation, construction of roads and temples within these areas, electric lines traversing through, and inadequate boundaries and fencing.

Madhuca longifolia (Koenig) Macbr., a plant well-suited to its ecological niche, is a dominant species in Thiruvalathur Ayyappan kavu at Kodumbu gramapanchayath, Palakkad. This particular grove's proximity to the Thiruvalathur river might contribute to the prevalence of Madhuca, possibly due to the presence of river-associated microorganisms.

The study also discussed the challenges posed to sacred groves, such as climate change, soil erosion, invasive species, and integration of indigenous knowledge. Sacred groves are associated with various rituals that fulfil needs like snake-related issues and certain diseases. These groves face threats like changing belief systems, invasive species, and infrastructure development. Effective management and conservation are crucial to maintaining these ecologically important sites.

Sacred groves, with their unique attributes and cultural significance, can be sustained through proper management and conservation efforts. Their protection is vital to preserving biodiversity, supporting watershed areas, and maintaining ecological integrity. Collaborative efforts involving communities, experts, researchers, government, and non-government organizations are essential for effective conservation and management of these groves.

1. **Spatial Dynamics and Ecological Roles:**
    - Conduct in-depth studies on the spatial interactions of plant species within sacred groves.
    - Investigate the ecological responsibilities of individual plant species to understand their contributions to the overall ecosystem.
2. **Cultural Significance:**
    - Undertake comprehensive cultural studies to explore the historical and cultural linkages of sacred groves.
    - Document traditional ecological knowledge associated with the cultural significance of sacred groves.
3. **Effective Conservation Frameworks:**
    - Develop tailored conservation strategies addressing both anthropogenic and environmental challenges.
    - Prioritize the creation and implementation of effective legal frameworks to safeguard sacred groves.
4. **Comparative Analysis:**
    - Encourage studies that compare sacred groves internationally and explore regional differences.
    - Analyse cross-cultural and regional variations in the characteristics and functions of sacred groves.
5. **Legal Protections:**
    - Advocate for the enhancement of legal frameworks to ensure comprehensive protection for sacred groves.
    - Bridge gaps in existing legislation to address potential threats and vulnerabilities.

6. **Global Integration:**

- Emphasize the global relevance of sacred groves by incorporating local findings into broader international discussions.
- Highlight the cultural and ecological significance of sacred groves on a global scale for better recognition and protection.

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PAPER PUBLICATIONS

1. **Praveenkumar. K** and **Udayan P.S.** 2022. Floristic diversity of sacred grove of Pathirakunnathmana, Chalavara, Palakkad district, Kerala State. Journal of Advanced Zoology. Vol. 43 S(1): 01-05.
2. **Praveenkumar. K**. 2023. Computer aided Statistical Study on Balancing Biodiversity Conservation and Cultural Heritage in Kerala's Sacred groves.
3. **Praveenkumar. K**. 2018. Floristic diversity of sacred grove of Madathody Nagakavu, Chalavara, Palakkad district, Kerala state. International Journal of Environment, Agriculture and Biotechnology. Vol.3(6): 2122-2125.

PAPER PRESENTATIONS

1. Kerala State Biodiversity Board - Kerala state Biological Diversity 2023 " From Agreement to Action : Build Back Biodiversity" – Paper : **Floristic diversity of Pathirakunnath Mana**
2. Department of Environmental Studies, Kannur University – National Seminar on R.E.T Species of Western Ghats ; challenges and Mitigation – Paper : **Floristic Diversity of Madathody Naga Kavu.**
3. Second International Conference on Advanced Information Science and Computing Systems (ICAISCS) 2023. Paper: **Computer aided Statistical Study on Balancing Biodiversity Conservation and Cultural Heritage in Kerala's Sacred groves.**
4. Second International Conference on Advanced Information Science and Computing Systems (ICAISCS) 2023. Paper: **Mitigating Invasive Species Threats in Palakkad District's Sacred groves : A Call to Action.**

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