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Angiosperm Diversity Of Kadikkavil Perumal Mridangasailam Kaavu In Kannur District, Kerala, India

Girish Kumar E.*, Anusree C. K., Pradeep Kumar G. and Sasikala K.

Mahatma Gandhi Government Arts College, Mahe, U.T. of Puducherry-673311, India.

ABSTRACT

Sacred groves are virgin forest fragments conserved by locals because of their beliefs in Deity, spirituality and culture. Kadikkavil Perumal Mridangasailam Kavu is a sacred grove in Kannur District of Kerala. It covers an area of approximately l.5 acres. The Angiosperm floristic studies of this grove documented 184 plant species in 157 genera distributed in 65 families. The area was dominanted by 10 families, of which Acanthaceae is the most dominant with 17 species and Verbenacea with 5 species the least. Of the total species recorded, 20 species are endemic, 50 species are medicinal and 12 species are edible. The presence of invasive alien species in the grove causes severe threat to native flora. Strict conservation measures need to be adopted for protection and management of the sacred grove.

Key words: Biodiversity, Kannur, Sacred grove, Endemism, Invasive-alien species

INTRODUCTION

Biological diversity is defined as the number, variety and variability of living organisms in a particular area. India is the one among the top ten mega diverse countries in the world with only 2.4 % of the world's land area, but about 8 % to the known global diversity. India is also native place of about 20,200 species angiosperms, among that approximately 26.8 % are endemic to India (Balasubramanian, 2017). Biodiversity is necessary for the existence of all living organisBiodiversity also have cultural, aesthetic, recreational and spiritual values. It provides many servims including human beings because it provides essential building blocks of life such as good environment, fresh water, clean air and food products as well as products such as timber, fiber etc. ces, but people not only use it for their need but also for their greed which consequently leads to various threats of biodiversity. The main threats of biodiversity are degradation, fragmentation and loss of habitat, spreading of invasive species, non-sustainable use of natural resources, change of climate, inappropriate fire regimes, changes within aquatic environment and water flows (Wanjui, 2013).

Sacred groves are one way of in-situ biodiversity conservation. They are distributed in all major continents (Chandran & Hughes, 2000; Malhotra et al., 2007). In Asia, sacred groves are distributed in India, Korea, Japan, China, Thailand and Indonesia. Sacred groves in general have many characteristics which are rooted to the belief of local population (Manjula & Norman, 2017). It is also characterized by many rare and endemic species conserved on certain religious belief of people (Kulkar, 1992; Kulkarni & Shindikar, 2005). In India, sacred groves are rampant among indigenous and tribal communities of almost all states. Most of the sacred groves in India are situated in Western Ghats region in the states of Maharashtra, Kerala, Karnataka, and Tamil Nadu.

In India nature worship dates back to the Vedic period and is based on the premise that all creations of nature have to be protected. Three categories of sacred groves are identified in India are; a) Traditional sacred groves: These are locations of origin and sustenance of Deity, b) Temple groves: These are forest fragment created around the temple and conserved; and c) Groves around the burial or cremation grounds. Sacred groves are generally called Kaavu or Sarppakaavu in Tamilnadu and Kerala. The sacred groves are the repositories of RET and endemic gene pools and also many medicinal plants of Ayurveda, tribal and folk medicines. Most of the groves are associated with small water bodies which support the survival of thallophytes and hydrophytes.

Diversity of sacred groves in Western Ghats and Kerala states has been studied in detail by various workers (Gadgil & Vartak 1975, 1976, 1981; Chandran & Gadgil, 1993; Unnikrishnan, 1995; Chandran et al., 2000; Anupama & Unni, 2009; Sreeja and Unni, 2016). Floristic analysis of small sacred forests at Agastheeshwaram in Southern peninsular India has been surveyed (Sukumaran & Jeeva, 2008). Sacred groves of Northern Kerala, especially Kannur and Kasargod districts were studied in detail (Unnikrishnan, 1995). Studies on 31 selected sacred groves of North Kerala in relation to socio-cultural and the ecological dimensions were conducted (Chandrasekara & Sankar, 1998). Floristic composition of five selected sacred groves from Thrissur district has been documented (Sivaperuman & Sujana, 2008). A study on phytodiversity, ecology, socio-cultural, socio-economic, conservation and management aspects of the sacred groves in Mahe has been carried out (Sasikala et al., 2014). Traditional worshiping plants from selected sacred groves of Kozhikode District were intensively documented (Chaithra & Thomas, 2017). Floristic composition and diversity of Sree Andalur sacred grove in Kannur district of Kerala has been investigated (Aiswarya & Arunprasath, 2018).

STUDY AREA AND MYTH

"Kadikaavil Perumal, Mridangasailam Kaavu" is situated in Kadikkapalam, Muzhakkunnu Grama Panchayath of Iritty Taluk, Kannur District of Kerala State, India. It covers an area of approximately 1.5 acres. It is situated around the traditional home "Mridangasailam". Here, daily rituals are not being done for Deity. But once in all Malayalam months, on the day called "samkramam" (the last day of a Malayalam month), poojas and worships are performed. 'Palonnam' and 'Padinhitta', which were two ancestral traditional 'tharavadus' of Kottiyur temple premise, are the present perfomers of rituals here. Infact, in olden times, worship in Kottiyoor Veerabadra Perumal was done by people in these traditional homes. But they migrated to Muzhakkunnu and Thillankeri regions because of destructive natural calamities that had occured during that time. The people who migrated to Muzhakkunnu became the owner of Kadikkaavil Srikrishna temple and built new traditional homes near the temple. This traditional home had a room dedicated solely to Perumal and Annapurneswari. The immigrants also got chance to perform daily rituals in Muzhakkunnu Mridangasaileswari temple. During that time this locality was attacked by British East India Company. In order to protect the Diety of Srikrishna temple, they destructed the temple themselves and sank the effigy in a pond for maintaining its purity. Then they migrated to a small hill called 'Maanikkunnu' and got themselves hidden there by making a small 'Illam' known as Mridangasailam. The Illam also had a room (Padinhaatakam) dedicated for the Deity. Now, this traditional home is surrounded by fragments of natural forest which is protected as a sacred grove. The mythology surrounding the area also reveals that the sacred grove has a connection with Kerala Varma Pazhassiraja. In 19th, April, 1796, when Pazhassikotta was attacked by British East India Company, Pazhassi Thampuran and his acolyte hid under the cover of this grove. In the year 2016, new Devasthanam was made for Perumal and Annapurneswari outside the Traditional Home, on the day which was the 220th anniversary of visit of the sacred grove by legendary Pazhassiraja.

National Medicinal Plant Board and State Medicinal Plant Board had conducted medicinal plant augmentation program for increasing diversity of medicinal plants in this sacred grove. For augmentation they have provided funds for selected sacred groves of Kerala. The Kadikkavil Perumal Mridangasailum Kaavu was one of the sacred groves selected for augmentation program during 2017-2019. Geographically "Kadikaavil Perumal, Mridangasailam Kavu" lies between 11.9418º N latitude and 75.7023º E longitude. Topography of the grove reveals that the land forms three strata of differing altitudes. The soil of the region is mainly lateritic though some patches of granite rocks are present in some areas. The lowermost strata of the grove have a small pond which harbours large number of water plants and animals. Two wells are the source of water reservoirs at the site. Typically the grove has rocky patches, literate dunes and wet land areas which summaries the diverse microclimatic conditions prevailing in the area.

METHODOLOGY

The field survey was conducted during on all seasons. The information about history, Deity, present cultural practices and conservation strategies was collected from local people and heir of sacred grove. Plant specimens from grove were collected, preserved, made in to herbarium and identified with the help of various Floras viz., Flora of Presidency of Madras (Gamble & Fischer, 1915-1936); Flora of Cannanore (Ramachandran & Nair, 1988) and Flowering plants of Kerala (Sasidharan, 2004) and the software of flowering plants of Kerala, Ver.2, by the KFRI. Standard herbarium technique (Fosberg & Sachet, 1965) was used for preservation of plant materials. Present status of "Kaavu", human interference with sacred grove, threats faced by groves and the socio-economic importance of sacred groves are also noted during the field trips.

RESULTS AND DISCUSSION

The study on angiosperm diversity of Kadikkavil Perumal Mridangasailum Kaavu yielded a total 184 angiosperms belonging to 157 genera **(**Table-1**)** under 65 families. Of these, 146 species were Dicotyledons under 50 families and 38 plant species were under Monocotyledons in 15 families. Besides angiosperms, lower forms like Thallophytes, Bryophytes and Pteridophytes were also present in the grove.

Table 1: List of Plant Species

Sl. No.	Binomial	Family	Habit	Distribution
1.	*Abelmoschus angulosus* Wall. ex Wight & Arn.	Malvaceae	Shrub	South India and Sri Lanka
2.	*Abrus pulchellus* Wall. ex Thw.	Fabaceae	Climber	Indo-Malesia & China
3.	*Acacia caesia* (L.) Willd.	Mimosaceae	Climber	Indo-Malesia
4.	*Acacia catechu* (L. f.) Willd.	Mimosaceae	Tree	India and Myanmar
5.	*Acampe praemorsa* (Roxb.) Blatt. & Mc Cunn	Orchidaceae	Herb	Sri-Lanka & Seychelles
6.	*Adenanthera pavonina* L.	Mimosaceae	Tree	India, Malesia and China
7.	*Aegle marmelos* (L.) Correa	Rutaceae	Tree	India and Sri Lanka
8.	*Alocasia macrorrhiza* (L.) G. Don in Sweet	Araceae	Herb	Tropical Asia
9.	*Alternanthera bettzickiana* (Regel) Voss in Vilmorin	Amaranthaceae	Herb #	Tropical America, Asia
10.	*Anacardium occidentale* L.	Anacardiaceae	Tree *	South America, Asia, Africa
11.	*Ananas comosus* (L.) Merr.	Bromeliaceae	Herb	Tropical Africa
12.	*Andrographis atropurpurea* (Dennst.) Alston	Acanthaceae	Herb	Western Ghats
13.	*Antidesma acidum* Retz.	Euphorbiaceae	Shrub	Indo-Malesia and South China
14.	*Aporosa cardiosperma* (Gaertn.) Merr.	Euphorbiaceae	Tree	Penisular India & Srilanka
15.	*Areca catechu* L.	Arecaceae	Tree	India, Africa, America
16.	*Artocarpus heterophyllus* Lam.	Moraceae	Tree *	Pantropical
17.	*Asystasia dalzelliana* Sant.	Acanthaceae	Herb	Tropical Asia and Africa
18.	*Axonopus compressus* (Sw.) P. Beauv.	Poaceae	Herb	Tropics & Subtropics
19.	*Ayapana triplinervius* (Vahl) R.M.King & H.Rob.	Asteraceae	Herb	Native of Tropical Africa
20.	*Bauhinia acuminata* L.	Caesalpinaceae	Shrub	Indo-Malesia
21.	*Biophytum sensitivum* (L.) DC.	Oxalidaceae	Herb	Indo-Malesia
22.	*Blyxa octandra* (Roxb.) Planch. Ex Thw.	Hydrocharitaceae	Herb	Indo-Malesia to Australia
23.	*Bryophyllum pinnatum* (Lam.) Kurz	Crassulaceae	Herb	Tropical Africa, Pantropical
24.	*Caesalpinia mimosoides* Lam.	Caesalpinaceae	Climber	Indo-Malesia
25.	*Caladium bicolor* (Ait. ex Dryand.) Vent.	Araceae	Herb	South America
26.	*Callicarpa tomentosa* (L.) L. in Murr.	Verbenaceae	Shrub	Penisular India & Srilanka
27.	*Calycopteris floribunda* Lam.	Combretaceae	Climber	Indo-Malesia
28.	*Canavalia gladiata* (Jacq.) DC.	Fabaceae	Climber	Pantropical
29.	*Carallia brachiata* (Lour.) Merr.	Rhizophoraceae	Tree	Indo-Malesia & Australia
30.	*Careya arborea* Roxb.	Lecythidaceae	Tree	Tropical Asia
31.	*Caryota urens* L.	Arecaceae	Tree	Indo-Malesia
32.	*Centella asiatica* (L.) Urban in Mart.	Apiaceae	Herb *	Asia & Africa
33.	*Centotheca lappacea* (L.) Desv.	Poaceae	Herb	Asia & Africa
34.	*Centrosema molle* Benth.	Fabaceae	Climber	Native of America
35.	*Chassalia curviflora* (Wall *ex* Kurz.) Thw.	Rubiaceae	Shrub	Indo-Malesia
36.	*Chionanthus mala-elengi* (Dennst.) P.S. Green	Oleaceae	Tree	Penisular India
37.	*Chonemorpha fragrans* (Moon) Alston	Apocynaceae	Herb	America, Tropical Asia
38.	*Chromolaena odorata* (L.) King & Robins.	Asteraceae	Climber #	India, Myanmar, Sri Lanka
39.	*Cinnamomum malabatrum* (Burm. f.) Blume	Lauraceae	Tree	Southern Western Ghats
40.	*Cissus discolor* Blume	Vitaceae	Climber	Indo- Malesia
41.	*Cissus repens* Lam.	Vitaceae	Climber	Indo-Malesia
42.	*Citharexylum spinosum* L.	Verbenaceae	Tree	Native of West Indies
43.	*Clerodendrum paniculatum* L.	Verbenaceae	Shrub	Indo-Malesia
44.	*Clitoria ternatea* L.	Fabaceae	Climber	Asia, South America
45.	*Cocos nucifera* L.	Arecaceae	Tree *	Panropical
46.	*Colocasia esculenta* (L.) Schott in schott &Endl.	Araceae	Herb *	Pantropical
47.	*Corchorus aestuans* L.	Tiliaceae	Herb	Pantropical
48.	*Corypha umbraculifera* L.	Arecaceae	Tree	Penisular India and Sri lanka
49.	*Costus speciosus* (Koenig) J.E. Smith	Costaceae	Herb	Indo-Malesia
50.	*Crassocephalum crepidioides* (Benth.)S.Moore	Asteraceae	Herb #	India, China & Africa
51.	*Curcuma zanthorrhia* Roxb.	Zingiberaceae	Herb	Indo Malaya

52.	*Cyathula prostrata* (L.) Blume	Amaranthaceae	Herb	Pantropical
53.	*Cyclea peltata* (Lam.) Hook. f. & Thoms.	Menispermaceae	Climber	India & Sri Lanka
54.	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb	Pantropical
55.	*Derris trifoliata* Lour.	Fabaceae	Climber	Paleotropics
56.	*Desmodium heterocarpon* (L.) DC	Fabaceae	Herb	Indo-Malesia China & Japan
57.	*Desmodium triquetrum* (L.) DC.	Fabaceae	Herb	Indo-Malesia to Pacific
58.	*Dimocarpus longan* Lour.	Sapindaceae	Tree	Islands & China
59.	*Dioscorea pentaphylla* L.	Dioscoreaceae	Climber	Indo-Malesia
60.	*Dipteracanthus prostratus* (Poir.) Nees in Wall.	Acanthaceae	Herb	Indo-Malesia and China
61.	*Dracaena terniflora* Roxb.	Dracaenaceae	Shrub	India
62.	*Ehretia canarensis* (Clarke) Gamble	Boraginaceae	Tree	India and south East Asia
63.	*Elephantopus scaber* L.	Asteraceae	Herb	Penisular India
64.	*Eranthemum capense* L.	Acanthaceae	Herb	Pantropical
65.	*Erythrina variegata* L.	Fabaceae	Tree	Penisular India & Sri Lanka
66.	*Ficus callosa* Willd.	Moraceae	Tree	India, china, and Myanmar
67.	*Ficus hispida* L. f.	Moraceae	Shrub	Indo-Malesia
68.	*Ficus religiosa* L.	Moraceae	Tree	Indo-Malesia to Australia
69.	*Floscopa scandens* Lour.	Commelinaceae	Herb	East Himalayas
70.	*Geophila repens* (L.) Johnst.	Rubiaceae	Herb	Indo-Malesia
71.	*Globba sessiliflora* Sim.	Zingiberaceae	Herb	Pantropical
72.	*Glycosmis pentaphylla* (Retz.) DC.	Rutaceae	Shrub	India to Thailand
73.	*Grewia serrulata* DC.	Tiliaceae	Tree	Indo-Malesia
74.	*Gymnema sylvestre* (Retz.) R. Br.	Asclepiadaceae	Climber	Indo-Malesia, Tropical Africa
75.	*Gymnostachyum febrifugum* Benth.	Acanthaceae	Herb	Indo-Malesia
76.	*Helicteres isora* L.	Sterculiaceae	Shrub	Southern Western Ghats
77.	*Hewittia malabarica* (L.) Suresh in Nicolson *et al.*	Convolvulaceae	Climber	Indo-Malesia,China, Australia
78.	*Hibiscus hispidissimus* Griff.	Malvaceae	Shrub	Asia, Africa & South America
79.	*Hibiscus rosa-sinensis* L.	Malvaceae	Shrub	Paleotropics
80.	*Holigarna arnottiana* Hook. f.	Anacardiaceae	Tree	South-west India
81.	*Hypolytrum nemorum* (Vahl) Spreng.	Cyperaceae	Herb	Southern Western Ghats
82.	*Hyptis suaveolens* (L.) Piot.	Lamiaceae	Herb #	Indo-Malesia to Fiji & China
83.	*Ichnocarpus frutescens* (L.) R.Br. in Ait. f.	Apocynaceae	Climber	America
84.	*Impatiens minor* (DC.) Bennet	Balsaminaceae	Herb	Indo-Malesia & Australia
85.	*Ixora coccinea* L.	Rubiaceae	Shrub	Penisular India
86.	*Ixora nigricans*R. Br. ex Wight & Arn.	Rubiaceae	Shrub	Penisular India&Srilanka
87.	*Ixora polyantha* Wight	Rubiaceae	Shrub	Western Ghats
88.	*Jasminum sambac* (L.) Ait.	Oleaceae	Climber	South and West Asia
89.	*Justicia gendarussa* Burm. f.	Acanthaceae	Herb	Sri Lanka, India, Myanmar
90.	*Justicia procumbens* L.	Acanthaceae	Herb	Tropical Africa and Asia
91.	*Justicia wynaadensis* (Nees) Heyne ex Anders.	Acanthaceae	Herb	Indo-Malesia and Australia
92.	*Kyllinga nemoralis* (J.R. & G.Forst.) Dandy.	Cyperaceae	Herb	Western Ghats
93.	*Lagenandra toxicaria* Dalz. in Hook.	Araceae	Herb	Pantropical
94.	*Lannea coromandelica* (Houtt.) Merr.	Anacardiaceae	Tree	Southern Western Ghats
95.	*Lantana camara* L.	Verbenaceae	Shrub #	Indo-Malesia & China
96.	*Lepidagathis incurva* Buch.- Ham. ex D.Don.	Acanthaceae	Herb	Native of Tropical America
97.	*Ludwigia hyssopifolia* (G.Don) Exell	Onagraceae	Herb	India, China & Myanmar
98.	*Macaranga peltata* (Roxb.) Mulle.	Euphorbiaceae	Tree	Pantropical
99.	*Mallotus philippiensis* (Lam.) Muell.	Euphorbiaceae	Tree	India,Srilanka and Andamans
100.	*Mangifera indica* L.	Anacardiaceae	Tree *	Indo-Malesia and Australia
101.	*Maranta arundinacea* L.	Marantaceae	Herb *	Indo-Malesia
102.	*Melastoma malabathricum* L.	Melastomataceae	Shrub	India & Sri Lanka
103.	*Merremia vitifolia* (Burm. f.) Gall. f. in Engl.	Convolvulaceae	Climber	South East Asia
104.	*Mesua ferrea* L.	Clusiaceae	Tree	Indo-China and China
105.	*Mikania micrantha* Kunth in HBK	Asteraceae	Climber #	Indo-Malesia
106.	*Mimosa pudica* L.	Mimosaceae	Herb	Pantropical
107.	*Mitragyna parviflolia* (Roxb.) Korth.	Rubiaceae	Tree	Pantropical
108.	*Morinda pubescens* J.E. Smith in Rees	Rubiaceae	Tree	Indo-Malesia
109.	*Mukia maderaspatana* (L.) Roem.	Cucurbitaceae	Climber	Indo-Malesia
110.	*Murdannia nudiflora* (L.) Brenan.	Commelinaceae	Herb	Paleotropics
111.	*Murdannia pauciflora* (Wight) Brueck.	Commelinaceae	Herb	Indo-Malesia & Africa
112.	*Musa paradisiaca* L.	Musaceae	Herb *	Indo-Malesia
113.	*Mussaenda frondosa* L.	Rubiaceae	Shrub	Tropics
114.	*Naregamia alata* Wight & Arn.	Meliaceae	Herb	Penisular India
115.	*Nelsonia canescens* (Lam.) Spreng.	Acanthaceae	Herb	Penisular India
116.	*Ochna integerrima* (Lour.) Merr.	Ochnaceae	Shrub	Pantropical
117.	*Ocimum basilicum* L.	Lamiaceae	Herb	Native of South East Asia
118.	*Ocimum tenuiiflorum* L.	Lamiaceae	Shrub	Central Asia & India
119.	*Olea diocia* Roxb.	Oleaceae	Tree	Paleotropic
120.	*Oplismenus compositus* (L.) P. Beauv.	Poaceae	Herb	India
121.	*Oroxylum indicum* (L.) Benth. ex Kurz	Bignoniaceae	Tree	Pantropical
122.	*Ottochloa nodosa* (Kunth) Dandy	Poaceae	Herb	South India and Srilanka
123.	*Panicum brevifolium* L.	Poaceae	Herb	South East Asia
124.	*Panicum notatum* Retz.	Poaceae	Herb	Paleotropics
125.	*Persea macarantha* (Nees) Kosterm.	Lauraceae	Tree	South & South East Asia
126.	*Phaulopsis imbricata* (Forssk.) Sweet.	Acanthaceae	Herb	Penisular India and srilanka
127.	*Phrynium pubinerve* Blume	Marantaceae	Herb	Indo-Malesia, China & Africa
128.	*Phyllanthus amarus* Schum. & Thonn.	Euphorbiaceae	Herb	India, Sri Lanka and Malesia
129.	*Piper betle* L.	Piperaceae	Climber	Tropics
130.	*Piper longum* L.	Piperaceae	Herb	India and Malesia
131.	*Piper nigrum* L.	Piperaceae	Climber *	Indo-malesia
132.	*Pogostemon purpurascens* Dalz. in Hook.	Lamiaceae	Herb	Penisular India and Srilanka

133.	*Pothos scandens* L.	Araceae	Climber	South West India
134.	*Pseuderanthemum malabaricum* (Clarke) Gamble	Acanthaceae	Herb	India, Malesia & Madagascar
135.	*Rauvolfia serpentina* (L.) Benth.ex Kurz	Apocynaceae	Herb	Penisular India & Sri Lanka
136.	*Rhaphidophora pertusa* (Roxb.) Schott	Araceae	Climber	South and South east Asia
137.	*Rhopalephora scaberrima* (Blume) Faden	Commelinaceae	Herb	India and Sri lanka
138.	*Ricinus communis* L.	Euphorbiaceae	Shrub	Indo-Malesia
139.	*Ruellia elegans* Pior.	Acanthaceae	Shrub	Tropics
140.	*Rungia pectinata* (L.) Nees in DC.	Acanthaceae	Herb	Native of South America
141.	*Salacia fruticosa* Heyne ex Lawson in Hook.f.	Hippocrateaceae	Climber	India, Sri Lanka & Myanmar
142.	*Sansevieria roxburghiana* Schult. & Schult. F.	Dracaenaceae	Herb	Western Ghats
143.	*Saraca asoca* (Roxb.) de Wilde	Caesalpinaceae	Tree	Coremandel Coast
144.	*Scleria lithosperma* (L.) Sw.	Cyperaceae	Herb	India and Myanmar
145.	*Sida acuta* Burm. f.	Malvaceae	Shrub #	Pantropical
146.	*Sida alnifolia* L.	Malvaceae	Herb	Pantropical
147.	*Sida beddomei* Jacob	Malvaceae	Herb	Indo-Malesia
148.	*Sida mysorensis* Wight & Arn.	Malvaceae	Herb	Southern Western Ghats
149.	*Sida rhomboidea* Roxb. ex Fleming	Malvaceae	Shrub	South & South East Asia
150.	*Smilax zeylanica* L.	Smilacaceae	Climber	Penisular India
151.	*Solanum torvum* Sw.	Solanaceae	Shrub *#	Indo-Malesia
152.	*Spermacoce hispida* L.	Rubiaceae	Herb	Tropics
153.	*Spermacoce latifolia* Aubl.	Rubiaceae	Herb	Penisular India
154.	*Spilanthes ciliata* HBK	Asteraceae	Herb	Native of Tropical America
155.	*Spilanthes radicans* Jacq.	Asteraceae	Herb #	Neotropics of the world
156.	*Strobilanthes ciliatus* Nees in Wall.	Acanthaceae	Shrub	Tropical America
157.	*Strychnos nux-vomica* L.	Loganiaceae	Tree	Southern Western Ghats
158.	*Swietenia macrophylla* King in Hook.	Meliaceae	Tree	Indo-Malesia
159.	*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	Herb #	Native of Central America
160.	*Syzygium caryophyllatum* (L.) Alston in Trimen	Myrtaceae	Shrub *	Native of west indies
161.	*Tabernaemontana alternifolia* L.	Apocynaceae	Tree	Western Ghats & Srilanka
162.	*Tamarindus indica* L.	Caesalpinaceae	Tree	Southern Western Ghats
163.	*Tectona grandis* L. f.	Verbenaceae	Tree	Native of Tropical Africa
164.	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Tree	South and South East Asia
165.	*Terminalia cuneata* Roth	Combretaceae	Tree	Indo-Malesia
166.	*Terminalia travancorensis* Wight & Arn.	Combretaceae	Tree	India and Srilanka
167.	*Theobroma cacao* L.	Sterculiaceae	Tree *	Western Ghats
168.	*Thottea siliquosa* (Lam.) Ding Hou	Aristolochiaceae	Shrub	Tropical America
169.	*Thunbergia erecta* (Benth.) Anders.	Acanthaceae	Shrub	Penisular India and Srilanka
170.	*Thunbergia grandiflora* (Roxb. ex Rottl.) Roxb.	Acanthaceae	Climber	Western Tropical Africa
171.	*Tinospora cordifolia* (Willd) Miers. in Ann.	Menispermaceae	Climber	Asia, Africa
172.	*Torenia bicolor* Dalz. in Hook.	Scrophulariaceae	Herb	Sri Lanka, India, Bangladesh
173.	*Trema orientalis* (L.) Blume	Ulmaceae	Tree	Western Ghats
174.	*Trichosanthes tricuspidata* Lour.	Cucurbitaceae	Climber	Tropical Africa & Australia
175.	*Urena lobata* L.	Malvaceae	Shrub #	India and Sri lanka
176.	*Uvaria narum* (Dunal) Wall. ex Hook. f.	Annonaceae	Climber	Pantropical
177.	*Vateria indica* L.	Dipterocarpaceae	Tree	South India & Srilanka
178.	*Vernonia cinerea* (L.) Lees.	Asteraceae	Herb	Western Ghats
179.	*Vigna dalzelliana* (O. Kzte.) Verdc.	Fabaceae	Climber	Pantropics
180.	*Wattakaka volubilis* (L. f.) Stapf	Asclepiadaceae	Climber	Western Ghats
181.	*Xylia xylocarpa* (Roxb.) Taub.	Mimosaceae	Tree	Indo-Malesia and China
182.	*Zeuxine longilabris* (Lindl.) Benth. ex Hook. f.	Orchidaceae	Herb	Indo-Malesia
183.	*Ziziphus oenoplia* (L.) Mill.	Rhamnaceae	Climber	Indo-Malesia
184.	*Ziziphus xylopyrus* (Retz.) Willd.	Rhamnaceae	Shrub	Tropical Asia & Australia
Sign * indicates the edible species and # indicates invasive-alien species.				

The plant species showed much variation in their habit (Life forms) with 75 herbs, 31 shrubs, 45 trees and 33 climbers. The herbs formed 40.76 %, shrubs 16.84 %, trees 24.45 % and climbers formed 17.93% of the total. In a similar study at Andalurkavu, a total of 101 species have been enumerated (Aiswarya & Arunprasath, 2022) and in comparison, the present study area had higher plant diversity than that of Andalurkavu. Among the plant species obtained from sacred grove, 20 species were endemic (Table-2), 12 species were edible and 11 species were invasive alien species. The dominant families of the sacred grove were Acanthaceae with 17 species, Rubiaceae with 10 species, Asteraceae, Fabaceae and Malvaceae with 9 species, Poaceae with 7 species, Araceae and Ephorbiaceae with 6 species and Mimosaceae and Verbenaceae with 5 plant species. The dominance of Acanthaceae in the present study contradicts with the study on ecology of selected sacred groves of Malabar (Anupama & Unni, 2009) which proposed the dominance of Rubiaceae. The genus *Sida* with 5 species is most dominant genus of the grove. Of the 184 species identified, 28 of them were of Indo-malesian in distribution, followed by Pantropical with a representation of 16 members.

Table 2: List of Endemic Species

Sl.No.	Scientific Name	Family	Distribution
1.	*Andrographis atropurpurea*	Acanthaceae	Western Ghats
2.	*Cinnamomum malabatrum*	Lauraceae	Western Ghats
3.	*Dipteracanthus prostratus*	Acanthaceae	India
4.	*Ehretia canarensis*	Boraginaceae	Penisular India
5.	*Globba sessiliflora*	Zingiberaceae	Penisular India
6.	*Gymnostachyum febrifugum*	Acanthaceae	Southern Western Ghats
7.	*Holigarna arnottiana*	Anacardiaceae	Western Ghats
8.	*Impatiens minor*	Balsaminaceae	Western Ghats
9.	*Ixora polyantha*	Rubiaceae	Western Ghats
10.	*Justicia wynaadensis*	Acanthaceae	Southern Western Ghats
11.	*Lagenandra toxicaria*	Araceae	South Western India
12.	*Mussaenda frondosa*	Rubiaceae	Penisular India
13.	*Naregamia alata*	Meliaceae	Penisular India
14.	*Olea diocia*	Oleaceae	India
15.	*Sida beddomei*	Malvaceae	Southern Western Ghats
16.	*Sida rhomboidea*	Malvaceae	Penisular India
17.	*Strobilanthes ciliatus*	Acanthaceae	Southern Western Ghats
18.	*Tabernaemontana alternifolia*	Apocynaceae	Southern Western Ghats
19.	*Torenia bicolor*	Scrophulariaceae	Western Ghats
20.	*Vateria indica*	Dipterocarpaceae	India

Out of 20 endemic plant species, 5 were endemic to southern Western Ghats, 6 endemic to Western Ghats, 5 endemic to peninsular India, 1 to south-west India and 3 were endemic to India. The *Saraca asoca* had vulnerable status according to IUCN. The endemism here is comparatively higher to number of endemic species in Cherayi padinjakkara sarpakavu in Thrissur, which had a meagre 5 endemics (Deepa et al., 2016). The flora of the Kavu was a rich source of edible plants, especially wild ones. The presence of edible plants is an indication of establishment of floral and faunal interactions towards a substainable system. Many of these act as repositories of germ plasm for future purpose.

An invasive alien plant is an exotic, introduced, non-native plant that was introduced by man intentionally or accidentally from its original distributional site to a new location. The Kadikavil Perumal Mridangasailam Kavu has 11 invasive species out of the total 184 species identified. Though this formed a meagre 6% of the total vegetation, their threat is evident because of exemplary richness. Of these, *Alternanthera bettzickiana* (American component), *Chromolaena odorata* and *Mikania micrantha* (Tropical American component) were the dominant invasive forms that may become a threat to the grove in future. The presence of invasive-alien species is in consonance with the research findings on general trend in sacred groves of Kanya kumara district of Tamil nadu (Pepsi et al., 2016).

CONCLUSION: Kadikaavil Perumal, Mridangasailam Kavu showed diverse type of Angiosperms and can be considered as a repository of indigenous and medicinal plants. The preliminary study showed the presence of 184 plant species of which, 20 plants are endemic. Most of the plant species collected from grove has medicinal property and about 50 plant species are commonly used as medicines by indigenous peoples for treating various diseases. Some anthropogenic factors, the changing beliefs on Deity and cultural transformations among people etc. are the major factors for deterioration of sacred groves.

REFERENCES

1. Anupama.c, and Unni, P. N. (2009) Ecological studies on select sacred groves of Malabar. PhD Thesis, Calicut Univetsity, Kerala.
2. Aiswarya, M. S., and Arunprasath, A. (2022) Floristic composition and diversity of Sree Andalur sacred grove, Kannur District, Kerala. International Journal of Botany 3(2): 186-189.
3. Balasubramanian, A. (2017). Biodiversity profile of India. *Report submitted to Centre for Advanced Studies in Earth Science, University of Mysore, Mysore*, *11*.
4. Chandran, M. D. Subash, and J. Donald Hughes (2000) Sacred Groves and Conservation: The Comparative History of Traditional Reserves in the Mediterranean Area and in South India. *Environment and History* 6 (2): 169–86.

5. Chandrashekhara, U.M. and Sankar, S. (1998) Ecology and management of sacred groves in Kerala, India. Forest Ecology and Management 112 (1-2):165-177.
6. Deepa, M. R., Dharmapal, S. and Udayan, P. S. (2016) Rare, endemic and medicinal plants of selected sacred groves in Chavakkad, Thrissur district, Kerala. Asian J. Biol. Life Sci. 5(1): 78 -87.
7. Fosberg, F. R. and Sachet, M. S. (1965) Manual for tropical herbaria. Regnum Vegetabile, vol. 39. International Bureau for Plant Taxonomy and Nomenclature, Utrecht, Netherlands.
8. Gadgil, M. and Vartak, V. D. (1975) Sacred groves of India: a plea for continued conservation. Journal of Bombay Natural History Society 72: 314-320.
9. Gadgil, M. and Vartak, V. D. (1976) The sacred groves of Western Ghats in India. Economic Botany 30: 152-160.
10. Gadgil, M. and Vartak, V. D. (1981) Sacred groves of Maharashtra: An inventory. In: S.K.Jain (Ed.) Glimpses of Ethnobotany, Offord University Press, Bombay, pp. 279-294.
11. Gamble, J. S and Fischer, C. E. C. (1915-1936) Flora of the Presidency of Madras. Vols. I – III, Adlard & Son Limited, London.
12. Khullar, P. (1992) Conservation of biodiversity in natural forest through preservation plots - A historical perspective. Indian forester 118 (5): 327–337.
13. Kulkarni, D.K. and Mahesh Shindikar (2005) Plant Diversity Evaluation in Shirkai sacred grove, Pune district, Maharashtra. Indian Journal of Forestry 28(2) 127–131.
14. Malhotra, K.C., Gokhale, Y., Chatterjee, S. and Srivastava, S. (2007) Sacred groves in India: an overview. Aryan Books International, New Delhi.
15. Manjula, V. and Norman Selvin Jebaraj, T. (2017) Sacred grooves – The drug store of herbal medicine. The Pharma Innovation Journal 6(9): 462-464.
16. Pepsi, A., Sukumaran, S. and Jeeva, S. (2016) Impact of noxious weeds on the growth of indigenous flora of sacred groves of Kanyakumari district, southern Western Ghats. International Journal of current advanced research 7(2): 10431-10435.
17. Ramachandran, V. S. and Nair, V. J. (1988). Flora of Cannanore, India: Botanical Survey of India.
18. Sasidharan, N. (2004) Biodiversity Documentation for Kerala Part 6: Flowering Plants. Kerala Forest Research Institute, Peechi.
19. Sasikala, K., Harilal, C. C. and Pradeepkumar, G. (2014) Phyto sociological studies of two sacred groves of Mahe, U.T. of Pondicherry, India. Biosci. Disc. 5(2): 154-159.
20. Sivaperuman, C. and Sujana, K. A. (2008) Status and conservation of Threatened Flora in Selected Sacred Groves of Coastal Kerala. Eco News 14 (2): 6-10.
21. Sreeja, K. and Unni, P. N. (2016) Floristic diversity of Vallikkaattu Kaavu, a sacred grove of Kozhikode, Kerala, India. *Journal of Ecology and the Natural Environment*. 8(10): 175-183.
22. Sukumaran, S. and Jeeva, S. (2008) A floristic study on miniature sacred forests at Agastheeshwaram, southern peninsular India. EurAsia J BioSci. 2 66-72.
23. Unnikrishnan, E., (1995) Sacred Groves of north Kerala: An Eco-folklore Study. Jeevarekha, Thrissur, Kerala, India, 229 pp (in Malayalam).
24. Wanjui, J. (2013) Biodiversity Conservation Needs and Method to Conserve the Biological Diversity. *J Bio divers Endanger Species* 1: (113).