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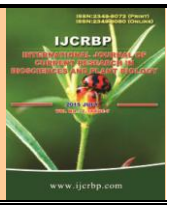

Original Research Article

Floristic Studies on Kilcheruvi (Edaicheruvi) Sacred Grove at Cuddalore District, Tamil Nadu, South India

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A b s t r a c t

Kilcheruvi (Edaicheruvi) Aiyanar and Mariyamman Sacred Grove (KISG) which belongs to the tropical dry evergreen forest. Geographically, it lies between Tholuthur to Tittakudi (079°04.947' E longitude and 11°24.320' N latitude) in the Cuddalore district and was explored for floristic studies which was reported for the first time in the year 2013-2014. The study indicated that totally, 185 plant species belonging to 158 genera and 58 families from 29 orders were enumerated in this sacred grove and followed by Angiosperm phylogeny Group III classification. The most dominant families found were Fabaceae (24), Apocynaceae (13), Malvaceae (9), Rubiaceae (8), Convolvulaceae (8) and Rutaceae (8) species. Rich biodiversity is present in the sacred grove. This has ensured the protection and conservation of the vegetation of the sacred grove.

K e y w o r d s

Aiyanar

APG III

Biodiversity

Kilcheruvi (Edaicheruvi)

Sacred Grove

Tropical dry evergreen forests

Introduction

India is a land of forests. It is also a land in which different traces have settled, and evolved unique interactions between themselves and nature. One of the significant outcomes of the interaction of people with nature is the extraordinary reverence towards nature in particular and landscape in general. Tamil literature belongs to the Sangam period (300 BC.–200 AD.) and describes a scenario where people were seen as one of the components of five different ecosystems. Each ecosystem had people carrying out their unique habits of hunting, gathering, cultivating and worshipping deities. It appears that the ancient deities of Tamil Nadu are the present deities worshipped in villages under different names. Although some of the deities may not be associated with extensive forest cover, most are found in intimate association with at least a small grove of plants. These are the Sacred Groves (Amirthalingam, 1998). Each grove continuous to have a residing deity and folklore associated with either the deity or the grove. The taboos, rituals and beliefs associated with the groves, supported by mystic folklore, have been the prime motivating factors for preserving them in pristine condition. People believe that any damage to the sacred grove, harm to the fauna residing in it or felling of any tree may invite the fury of the local deity, thus causing diseases and failure of agricultural crops. Even taking a dry twig from the grove is forbidden. Therefore, many people will not even take dead wood out of the sacred groves. In general, they are dedicated to Aiyanar, Sastha, Muniyappa, Karuppuswami, Veeran (*Kaaval*

Theivam/Protective Deity), Andavar (a powerful wish fulfilling deity) and goddesses Selliyamman, Kali, Ellaikali, Ellaipidari, Sapta Kannis, Pechiyamman, Rakkachiyamman and Nagadevadhai (fertility and good health). Among these, Aiyanar is the most worshipped deity. He is worshipped every Friday by the local people and also offered special *pooja* on some occasions.

Sacred groves are the last remnants of the native vegetation of that region. Many villages are still preserving them as regions of numerous native species of plants, animals, insects and micro-organisms. This indicates the efforts made by the local communities to protect and preserve their natural forest tracts against the onslaught of the clearing of forests for cultivation and settlement.

Sacred groves were first described by Brandis (1897). More recently, Gadgil and Vartak (1981) reviewed the presence of the sacred groves in different states and stated that the sacred groves are a small patch of forest or a part of the forest which was left untouched by the local inhabitants due to fear and faith and religious beliefs and taboos (Gadgil and Vartak, 1975). Sacred groves are valuable culturally and historically as sacred sites, though they cannot be considered as a forest. Generally, therefore, they can be considered as biological reserves which are similar to biosphere reserves and probably constitute the only representation of forests in near-virgin condition in many parts of India and in Tamilnadu in particular (Gadgil and Vartak, 1976). They are a kind of conservation area and as well as a spiritual retreat.

Tropical Dry Evergreen Forests (TDEFs) in Tamil Nadu are restricted to the east coast. They are spread from Pulicat in the north to Vedaranyam in the south. TDEFs generally occur along the sandy coast, interior coastal plains with red laterite soil on isolated hillocks scattered along the east coast. Natural vegetation on the south-eastern coast of peninsular India has now been highly degraded and reduced to patches. Only a few isolated fragments of TDEFs exist, mostly in the form of sacred groves that are mainly protected due to religious and cultural beliefs (Meher-Homji, 1986).

According to Meher Homji (1974a), phytodiversity and documentation of ethnobotanically important species and analysing the vegetation structure has long been the subject of study by taxonomists and ecologists. A thin strip of land along the Coromandal coast which receives both summer and winter rainfall supports the Tropical Dry Evergreen Forest (Champion and Seth, 1968). The annual rainfall in this region varies between 1000mm to 1500 mm with most of the rainfall falling towards the end of the year. This rainfall determines the evergreen vegetation found in the area (Meher-Homji, 1974b; Sprangers and Balasubramaniam, 1978; Gnanasekaran et al., 2012).

The temple groves and the reserve forests comprise of evergreen vegetation, especially in the temple groves on the coastal belt. It is therefore proper to describe this vegetation as "evergreen". There is a marked difference between the groves and the reserve forests in terms of dominant species, evergreenness and structure. It is not yet clear as to whether these differences relate to soil, other environmental conditions, anthropogenic disturbance or a combination of both. Be that as it may, it is evident that both the groves and the inland reserve forests should be included in our efforts at understanding the TDEF.

It has been noticed that the TDEF does not contain a uniform type of vegetation. There is considerable variation in the composition of species. This is especially so in the case of Puducherry, Cuddalore and the adjoining coastal areas. This variation needs to be studied and documented in order to put in place effective conservation measures. A point of consideration should also be as to whether the species found in the Reserve Forests can be classified in the same category as those found in the TDEF (Paul Blanchflower, 2003.).

In this paper, we have taken a sample survey of a grove situated in the Reserve Forests as a test case to determine whether it can also be classified in the category of TDEF. The objective of the study is to prepare a check list of plant species found in the Kilcheruvi (Edaicheruvi) sacred grove and also to prepare a checklist of threatened and endemic species of this particular grove. Further, it is also the objective to study the potential threats to the sacred grove and to suggest conservation measures to preserve and protect the grove.

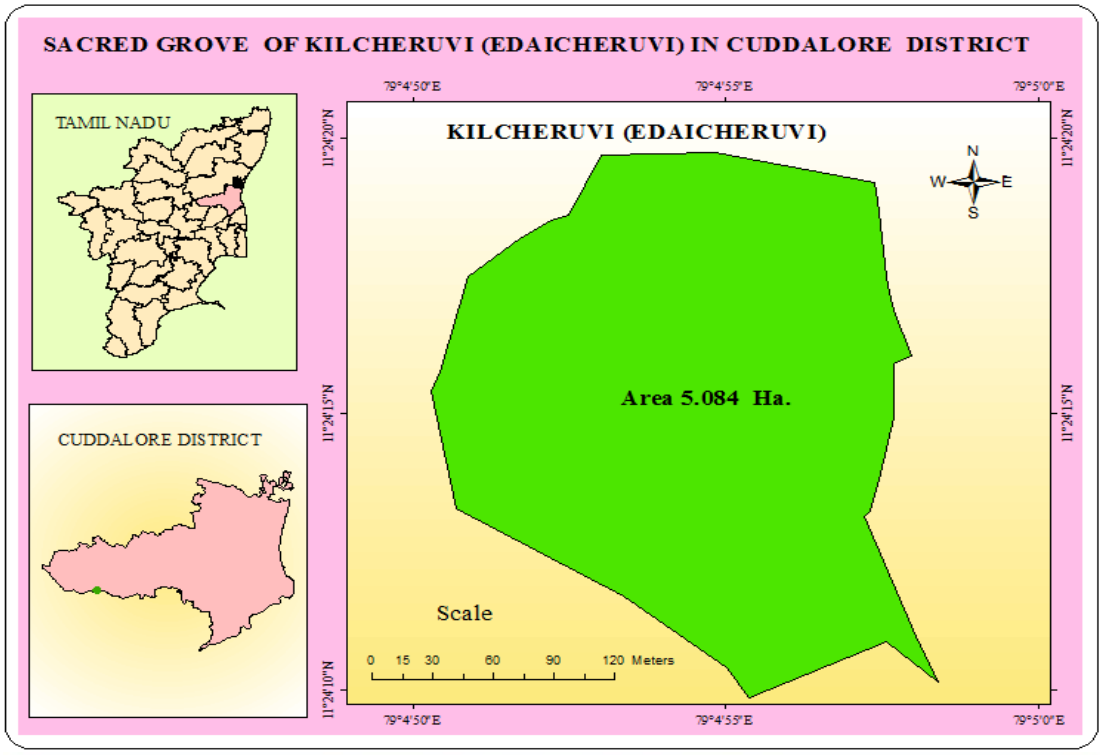
Materials and methods

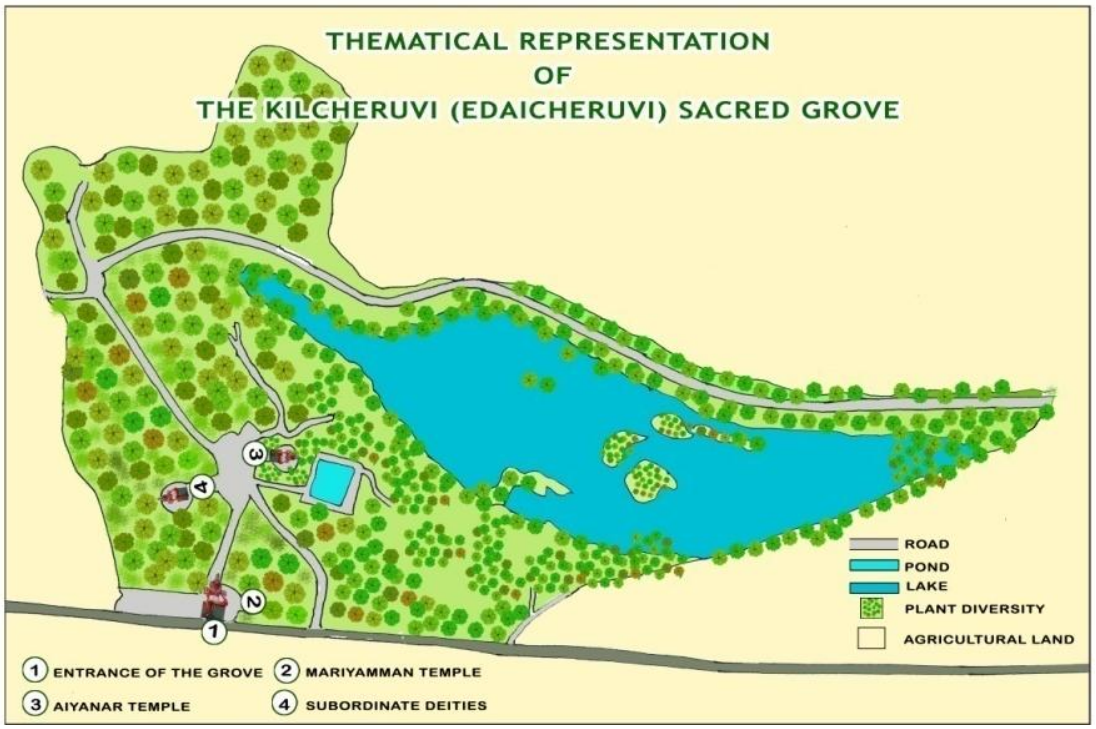
Study area

Kilcheruvi (Edaicheruvi) Sacred Grove (KISG) consists of the Reserve Forests/plains which differ considerably in terms of dominant species, evergreenness and structure. However, it also classified as the TDEF type. The area of

the grove is about 5.084 hectares and it is located on the northern bank of the Wellington Lake, nearly 3 km away from Tittakudi taluk of Cuddalore district, Tamil Nadu. Geographically, it lies between Tholuthur to Tittakudi (079°04.947' E longitude and 11°24.320' N latitude) (Fig. 1). The temperature is moderately high and the average temperature during summer is 41°C and the average winter temperature is 20°C. The average percentage of deviation in the rainfall in Cuddalore district is about 50mm. The seasonal rainfall ranges from 46mm (in the month of July) and the maximum rainfall falls during the month of May (169mm). In general, the district received a total of 652.1 mm rain fall and an average of 1309.4 mm during the year 2014.

Fig. 1: Kilcheruvi (Edaicheruvi) Sacred grove base map and its thematical representation.



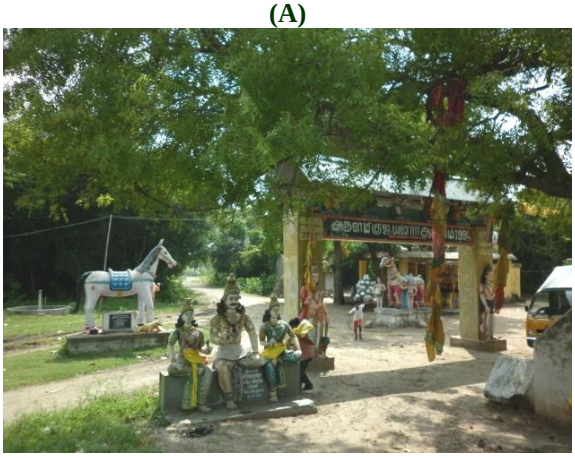


The sacred grove is situated on the left side of the Vellar River to the right of the Wellington Lake, north of A.pallaiyam village and east of Agaram Seegoor village. The grove is surrounded on two sides by agricultural land. The grove is associated with deities such as Aiyanar, Mariyamman, Muniyappan, Selliyamman, Sempalaiyappa, Karuppu, Pillaiyar, Muthu Karuppu and Nondi Karuppu (Fig. 2).

Fig. 2: Deities, plant richness and important religious ceremony in the study site.

(A) Entrance of the grove; (B) Concretised road; (C) Munishwara and Karuppuswamy temples; (D) Plant richness of the grove; (E) Aiyanar, the main guardian deity associated with the grove; (6) Muppoosai (Three pujas i.e., sacrificing of a goat, pig and cock).

(A)



(B)

(C)

(D)

(E)

(F)

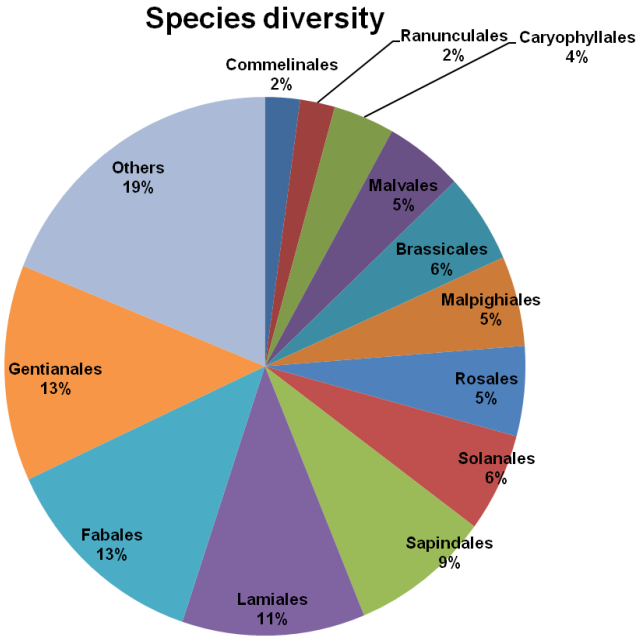
Data collection

The data collection was done from the Kilcheruvi (Edaicheruvi) Sacred grove. The field survey was made during the months of June 2013 to March 2014. Plants either with flowers or fruits were collected and identified or confirmed with available regional flora with the help of Gamble (1915 – 1936), Matthew (1982, 1983 and 1988), Nair and Henry (1983), Henry et al. (1987, 1989), Sanjappa (1992), Balakrishnan and Chakrabarthy (2007), Karthikeyan et al. (2009) have also been referred for the correct botanical names for the specimens identified. Photographs have also been taken. The herbarium was also prepared for all the plants and has been deposited in the Presidency College, Chennai.

Results and discussion

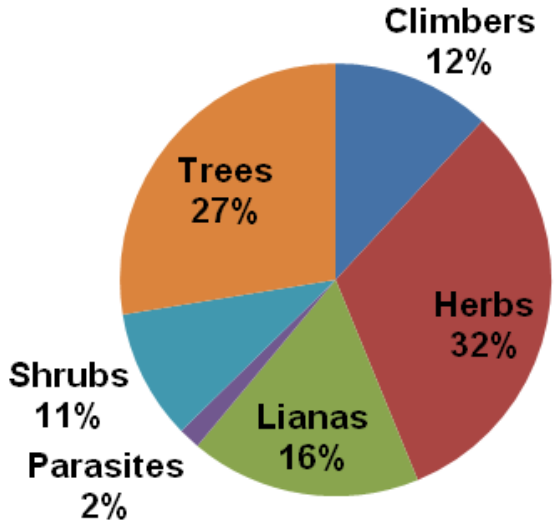
The present study of the flora of Kilcheruvi (Edaicheruvi) Sacred Grove (KISG) comprises of about 185 plant species belonging to 58 families and 158 genera based on the Angiosperm Phylogency Group III Classification (2009). The identified plant list from the sacred grove is given in Appendix-1. From the study we can identify the dominant clades of Lamids 31%, Fabids 27%, Malvids 25% followed by orders Gentianales and Fabales both are 13%, Laminales 11%, Sapindales 9%, Brassicales and Solanales 6%, Mapighiales and Malvales 5% (Fig. 3).

Fig. 3: Species distribution of plants in Kilcheruvi (Edaicheruvi) Sacred grove.



This is followed by the families such as Fabaceae (24), Apocynaceae (13), Malvaceae (9), Acanthaceae, Rubiaceae and Rutaceae are present (8). Among habit wise distribution, herbs were the dominant species represented by 32% with 59 species and trees (51 species 27%), Lianas (29 species, 16%), Climber (22 species, 12%), Shrubs (21 species, 11%) Parasites (3 species, 2%) (Fig. 4). Among the generic wise distribution, the genus *Ficus* as was the dominant genus represented by four species followed by *Acacia*, *Capparis*, *Commelina*, *Senna* and *Strychnos* which are distributed with three species each (Fig. 5).

Fig. 4: Life forms of plant diversity in Kilcheruvi (Edaicheruvi) Sacred grove.



The vegetation of the sacred grove is characterized by most of the TDEF tree species such as *Atalantia monophylla*, *Garcinia spicata*, *Lepisanthes tetraphylla*, *Memecylon edule* and *Pterospermum canescens*; liana namely *Cissus vitiginea*, *Combretum albidum* and *Reissantia indica* and shrubs include *Canthium coromande1icum*, *Capparis brevispina*, *Carissa spinarum*, *G1ycosmis mauritiana*, *Securinega leucopyrus* and *Tarenna asiatica***.** It is also an abode for some of the rare plant species such as *Polyalthia korintii*, *Phyllanthus rotundifolius* and *Capparis rotundifolia* (Mitra, 1993; Nair and Nayar, 1997; Balakrishnan and Chakrabarthy, 2007).

Udayakumar and Parthasarathy (2010) have recorded only 312 taxa from 75 TDEF sites on the Southern Coromandel Coast, whereas the study area covers a total of 182 taxa which have been recorded. It is nearly 60% of the total species diversity of the TDEF vegetation on the Southern Coromandel Coast.

Fig. 5: Plants found in the Kilcheruvi (Edaicheruvi) Sacred grove. (1). *Acacia caesia* (L.) Willd.; (2.) *Abrus precatorius* L.; (3). *Dendrophthoe falcata* (L.f.) Ettingsh.; (4). *Dioscorea oppositifolia* L.; (5). *Strychnos nux-vomica* L.; (6). *Chloroxylon swietenia* DC.; (7). *Cyphostemma setosum* (Roxb.) Alston.

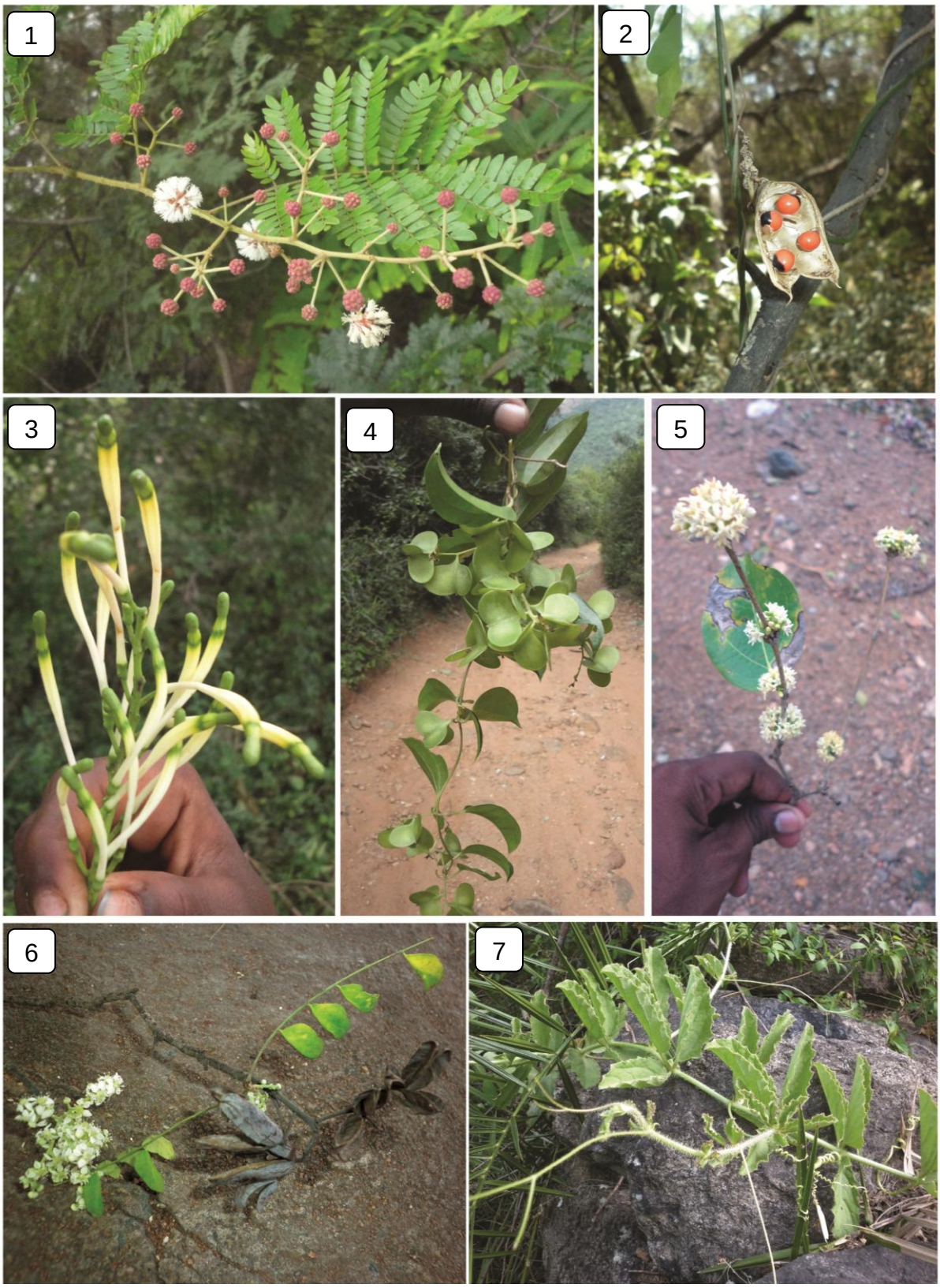


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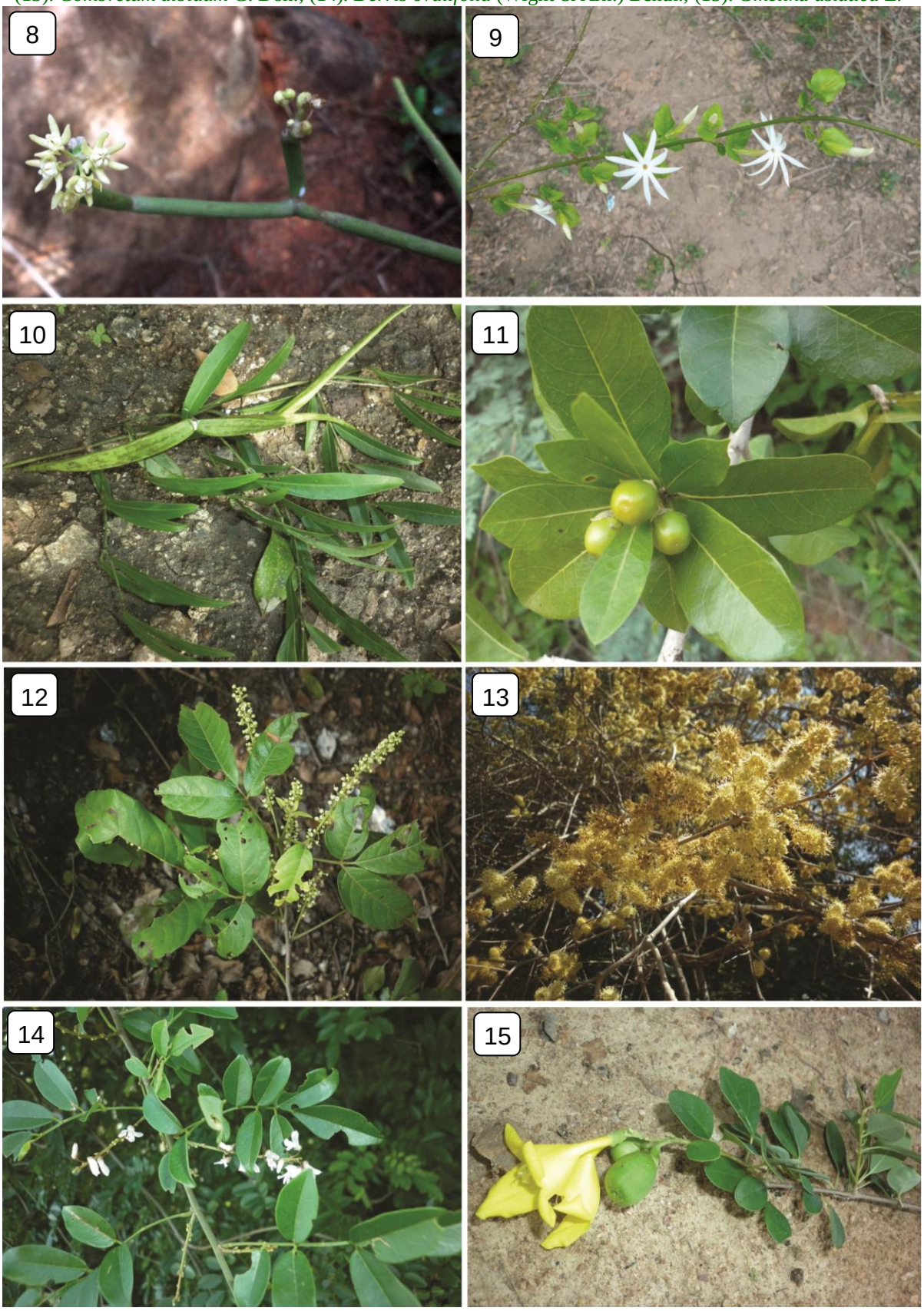
Fig. 5: Contd… (8). *Sarcostemma acidum* (Roxb.) Voigt.; (9). *Jasminum angustifolium* (L.) Willd.; (10). *Secamone emetica* (Retz.) R. Br. ex Schult.; (11). *Hugonia mystax* L.; (12). *Allophylus serratus* (Roxb.) Kurz.; (13). *Combretum albidum* G. Don.; (14). *Derris ovalifolia* (Wight & Arn.) Benth.; (15). *Gmelina asiatica* L.



A perusal of literature on the phytodiversity of the recently studied neighborhoods sacred groves from Cuddalore, Puducherry and Pudukottai shows that a total of 136 taxa from Olagapuram, 74 from Orani, 55 from Keezhbuvanagiri, 45 from Kilialamman, 40 from Periyakkattupalayam, 36 from Periyamudaliyar chavadi, 136 from Suriampettai and 92 from Kulandaikuppam sacred groves have been reported by various authors (Ramanujam and Kadamban, 2001; Ramanujam and Cyril, 2003). A comparison of the phytodiversity in the Kilcheruvi (Edaicheruvi) sacred grove with the above mentioned sacred groves reveals that the Kilcheruvi sacred grove has the highest plant diversity.

The considerable reduction in the size of the sacred grove is due to the encroachment of land for agriculture, floriculture, etc. It has been observed that the aforementioned is the major factor which destroys the sacred grove. It has been further been pointed out that this grove is still being cleared. The firewood is being collected from the grove only from the dry and fallen twigs and stump of lopped trees. This is indicative of anthropogenic disturbance.

Kilcheruvi Sacred Grove is a comparatively well-conserved grove covering an area of 5.084 ha with rich phytodiversity and a good sampling of endemic species. The high level of species richness is testimony to the health of the sacred grove. This culturally conserved patch of natural vegetation acts as a centre of biodiversity conservation and as a source of water and livelihood.

Hence, it is suggested that Kilcheruvi Sacred Grove (KISG) may be proposed as a Biodiversity Heritage Site as envisaged by the National Environmental Policy and this proposal has already been initiated by the National Biodiversity Authority (NBA) by establishing the Biodiversity Management Committee (BMC).

An awareness of the importance of the sacred grove needs to be created among the local people for effective conservation. According to Gadgil (1994), the necessity of the National Level Sacred Grove Act for the conservation of sacred groves in India is a desirable outcome. It also becomes essential to map and study the existing sacred groves of India in general and Tamil Nadu in particular, with the help of the geographical information system (GPS) in order to develop effective conservation strategies throughout the country.

Acknowledgement

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Appendix –1

List of plant species in Kilcheruvi Sacred grove.

Sl. No.	Order/Family	Botanical name of the plant	Life form	Voucher number
	MAGNOLIDS			
	Laurales Juss. ex Bercht & J.Presl.			
1	Lauraceae Juss	*Cassytha filiformis* L.	P	V.N.1244
	Piperales Bercht. and J. Presl			
2	Aristolochiaceae Juss.	*Aristolochia indica* L.	C	V.N.1131
	MONOCOTS			
	Alismatales R. Br. ex Bercht. and J. Presl			
3	Dioscoreaceae R. Br.	*Dioscorea pentaphylla* L.	C	V.N.1376
4		*Dioscorea oppositifolia* L.	C	V.N.1535
	Asparagales Link			
5	Asparagaceae Juss.	*Asparagus racemosus* Willd.	C	V.N.1237
6		*Sansevieria roxburghiana* Schult. & Schult. f.	H	V.N.1616
7	Xanthorrhoeaceae Dumort.	*Aloe vera* (L.) Burm.f.	H	V.N.1199
	Liliales Perleb			
8	Liliaceae Juss.	*Gloriosa superba* L.	C	V.N.1382
	COMMELINIDS			
	Arecales Bromhead			
9	Arecaceae Bercht. and J. Presl	*Borassus flabellifer* L.	T	V.N.1219
10		*Phoenix pusilla* Gaertn.	S	V.N.1608
	Commelinales Mirb. ex Bercht. and J. Presl			
11	Commelinaceae Mirb.	*Commelina attenuata* J. König ex Vahl	H	V.N.1534
12		*Commelina benghalensis* L.	H	V.N.1430
13		*Commelina longifolia* Lam.	H	V.N.1370
14		*Cyanotis cristata* (L.) D. Don	H	V.N.1740
	Poales Small			
15	Cyperaceae Juss.	*Bulbostylis barbata* (Rottb.) Kunth ex C.B. Clarke	H	V.N.1220
16	Poaceae Barnhart	*Apluda mutica* L.	H	V.N.1424
17		*Chloris barbata* Sw.	H	V.N.1362
	EUDICOTS			
	Ranunculales Juss. ex Bercht. and J. Presl			
18	Menispermaceae Juss.	*Cissampelos pareira* L	C	V.N.1364
19		*Cocculus hirsutus* (L.) W.Theob.	C	V.N.1532
20		*Pachygone ovata* (Poir.) Hook. f. & Thomson	L	V.N.1601
21		*Tinospora cordifolia* (Willd.) Hook. f. &Thomson	L	V.N.2125
	CORE EUDICOTS **ROSIDS**			
	Vitales Juss. ex Bercht. and J. Presl			
22	Vitaceae Juss	*Cissus vitiginea* L.	C	V.N.1365
23		*Cissus quadrangularis* L.	C	V.N.1530
24		*Cyphostemma setosum* (Roxb.) Alston.	C	V.N.1743
	FABIDS			
	Celastrales Link			
25	Celastraceae R. Br.	*Cassine glauca* (Rottb.) Kuntze	T	V.N.1243
26		*Maytenus emarginata* (Ruiz & Pav.) Loes.	S	V.N.1759
27		*Reissantia indica* (Willd.) N. Hallé	L	V.N.1612

Sl. No.	Order/Family	Botanical name of the plant	Life form	Voucher number
	Cucurbitales Juss. ex Bercht. and J. Presl			
28	Cucurbitaceae Juss.	*Coccinia grandis* (L.) Voigt	C	V.N.1369
29		*Cucumis maderaspatana* L.	C	V.N.1738
30		*Mukia maderaspatana* (L.) M.Roem.	C	V.N.1766
	Fabales Bromhead			
31	Fabaceae Lindl.	*Abrus precatorius* L.	C	V.N.1132
32		*Acacia leucophloea* (Roxb.) Willd.	T	V.N.1196
33		*Acacia caesia* (L.) Willd.	L	V.N.1236
34		*Acacia nilotica* (L.) Delile	T	V.N.1312
35		*Albizia amara* (roxb.) Boivin	T	V.N.1377
36		*Albizia lebbeck* (L.) Benth.	T	V.N.1217
37		*Butea monosperma* (Lam.) Taub.	T	V.N.1221
38		*Caesalpinia bonduc* (L.) Roxb.	C	V.N.1426
39		*Canavalia virosa* (Roxb.)	C	V.N.1331
40		*Cassia fistula* L.	T	V.N.1242
41		*Clitoria ternatea* L.	C	V.N.1368
42		*Derris ovalifolia* (Wight & Arn.) Benth.	L	V.N.1746
43		*Derris scandens* (Roxb.) Benth.	L	V.N.1534
44		*Dichrostachys cinerea* (L.) Wight & Arn.	T	V.N.1375
45		*Mimosa pudica* L.	H	V.N.1761
46		*Peltophorum pterocarpum* (DC.) K.Heyne	T	V.N.1607
47		*Pongamia pinnata* (L.) Pier.	T	V.N.1611
48		*Prosopis juliflora* (sw.) Dc.	T	V.N.1769
49		*Pterolobium hexapetalum* (Roth) Santapau & Wagh	L	V.N.1544
50		*Senna auriculata* (L.) Roxb.	H	V.N.1622
51		*Senna occidentalis* (L.) Link	H	V.N.1913
52		*Senna siamea* (Lam.) H. S. Irwin & Barneby	H	V.N.1544
53		*Tamarindus indica* L.	T	V.N.1922
54		*Tephrosia purpurea* (L.) pers.	H	V.N.2124
	Malpighiales Juss. ex Bercht. and J. Presl			
55	Euphorbiaceae Juss.	*Acalypha indica* L.	H	V.N.1237
56		*Croton bonplandianus* Baill.	H	V.N.1737
57		*Euphorbia antiquorum* L.	T	V.N.1747
58		*Jatropha gossypiifolia* L.	S	V.N.1757
59		*Phyllanthus amarus* Schumach. & Thonn.	H	V.N.1609
60	Linaceae DC. ex Perleb	*Hugonia mystax* L.	L	V.N.1752
61	Passifloraceae Juss. ex Roussel	*Passiflora foetida* L.	C	V.N.1604
62	Phyllanthaceae Martinov	*Flueggea leucopyrus* Willd.	S	V.N.1380
63	Salicaceae Mirb	*Flacourtia indica* (Burm. f.) Merr.	S	V.N.1379
64	Violaceae Batsch	*Hybanthus enneaspermus* (L.) F.v. Muell.	H	V.N.1753
	Rosales Bercht. and J. Presl			
65	Moraceae Gaudich, nom. cons.	*Ficus amplissima* J. E.	T	V.N.1537
66		*Ficus religiosa* L.	T	V.N.1749
67		*Ficus benghalensis* L.	T	V.N.1829
68		*Ficus hispida* L. f.	T	V.N.1378
69		*Streblus asper* Lour.	T	V.N.1917

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70	Rhamnaceae Juss.	*Scutia myrtina* (Burm. f.) Kurz	L	V.N.1620
71		*Ventilago maderaspatana* Gaertn.	L	V.N.2131
72		*Ziziphus mauritiana* Lam.	T	V.N.1625
73		*Ziziphus oenoplia* (L.) Mill.	L	V.N.2135
74	Ulmaceae Mirb.	*Holoptelea integrifolia* (Roxb.) Planch.	T	V.N.1751
	Zygophyllales Link			
75	Zygophyllaceae R. Br.	*Tribulus terrestris* L.	H	V.N.2127
	MALVIDS			
	Brassicales Bromhead			
76	Capparaceae Juss.	*Cadaba fruticosa* (L.) Druce	S	V.N.1222
77		*Capparis brevispina* DC.	L	V.N.1333
78		*Capparis sepiaria* L.	L	V.N.1429
79		*Capparis zeylanica* L.	L	V.N.1238
80		*Cratavea manga* (Lour.) DC.	T	V.N.1373
81	Cleomaceae Bercht. and J. Presl	*Cleome gynandra* L.	H	V.N.1531
82		*Cleome viscosa* L.	H	V.N.1366
83	Moringaceae Martinov.	*Moringa oleifera* Lam.	T	V.N.1765
84	Salvadoraceae Lindl.	*Azima tetracantha* Lam.	S	V.N.1134
85		*Salvadora persica* L.	T	V.N.1615
	Caryophyllales Juss. ex Bercht. and J. Presl			
86	Amaranthaceae Juss.	*Achyranthes aspera* L.	H	V.N.1313
87		*Aerva lanata* (L.) Juss. ex Schult.	H	V.N.1197
88		*Amarantus viridis* L.	H	V.N.1133
89	Cactaceae Juss.	*Opuntia dillenii* (Ker Gawl.) Haw.	H	V.N.1600
90	Molluginaceae Bartl.	*Glinus oppositifolius* (L.) Aug.DC.	H	V.N.1381
91		*Mollugo pentaphylla* L.	H	V.N.1763
92	Nyctaginaceae Juss.	*Boerhavia diffusa* L.	H	V.N.1218
	Malvales Juss. ex Bercht. and J. Presl			
93	Malvaceae Juss.	*Abutilon indicum* (L.) Sweet	H	V.N.1175
94		*Corchorus aestuans* L.	H	V.N.1372
95		*Grewia orientalis* L.	S	V.N.1385
96		*Guazuma ulmifolia* Lam.	T	V.N.1536
97		*Malvastrum coromandelianum* (L.) Garcke	H	V.N.1543
98		*Pavonia zeylanica* Cav.	H	V.N.1605
99		*Sida acuta* Burm.f.	H	V.N.1545
100		*Sida cordifolia* L.	H	V.N.1914
101		*Triumfetta rhomboidea* Jacq.	H	V.N.2129
	Myrtales Juss. ex Bercht. and J. Presl			
102	Combretaceae R. Br.	*Calycopteris floribunda* Lam.	L	V.N.1428
103		*Combretum albidum* G. Don.	L	V.N.1533
104	Myrtaceae Juss.	*Syzygium cumini* (L.) Skeels	T	V.N.1920
	Santalales R. Br. ex Bercht. and J. Presl			
105	Loranthaceae Juss	*Dendrophthoe falcata* (L.f.) Ettingsh.	P	V.N.1745
	Sapindales Juss. ex Bercht. and J. Presl			
106	Anacardiaceae R. Br.	*Lannea coromandelica* (Houtt.) Merr.	T	V.N.1538
107		*Mangifera indica* L.	T	V.N.1758
108	Meliaceae Juss.	*Aglaia elaeagnoidea* (A. Juss) Benth	T	V.N.1198
109		*Azadirachta indca* A. Juss.	T	V.N.1425

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110	Rutaceae Juss.	*Aegle marmelos* (L.) Corr. Serr.	T	V.N.1375
111		*Atalantia monophylla* (L.) DC.	T	V.N.1530
112		*Chloroxylon swietenia* DC.	T	V.N.1363
113		*Glycosmis mauritiana* (Lam.) Tanaka	S	V.N.1383
114		*Limonia acidissima* L.	T	V.N.1541
115		*Pamburus missionis* (Wall. ex Wight) Swingle	T	V.N.1602
116		*Pleiospermium alatum* (Wight & Arn.) Swingle	T	V.N.1610
117		*Toddalia asiatica* (L.) Lam.	L	V.N.2126
118	Sapindaceae Juss.	*Allophylus serratus* (Roxb.) kurz.	S	V.N.1422
119		*Cardiospermum helicacabum* L.	C	V.N.1239
120		*Lepisanthes tetraphylla* (Vahl) Radlk.	T	V.N.1540
121		*Sapindus emarginatus* Vahl	T	V.N.1617
	ASTERIDS			
	Cornales			
122	Cornaceae Bercht & J.Presl.	*Alangium salviifolium* (L. f.) Wangerin	T	V.N.1376
	Ericales Bercht. and J. Presl			
123	Ebenaceae Gürke	*Diospyros ebenum* J. Koeng. Ex Retz.	T	V.N.1536
124		*Diospyros montana* Roxb.	T	V.N.1377
125	Sapotaceae Juss.	*Madhuca longifolia* (L.) J. F. Macbr.	T	V.N.1542
	LAMIIDS			
	Gentianales Juss. ex Bercht. and J. Presl			
126	Apocynaceae Juss.	*Calotropis gigantea* (L.) Dryand.	S	V.N.1427
127		*Carissa spinarum* L.	S	V.N.1240
128		*Catharanthus roseus* (L.) G.Don	H	V.N.1360
129		*Gymnema sylvestre* (Retz.) Schult.	C	V.N.1537
130		*Hemidesmus indicus* (L.) R. Br. ex Schult.	C	V.N.1750
131		*Ichnocarpus frutescens* (L.) W.T.Aiton	C	V.N.1754
132		*Nerium oleander* L.	S	V.N.1767
133		*Sarcostemma acidum* (Roxb.) Voigt	C	V.N.1618
134		*Secamone emetica* (Retz.) R. Br. ex Schult.	L	V.N.1621
135		*Tabernaemontana divaricata* (L.) R.Br. ex Roem. & Schult.	S	V.N.1921
136		*Tylophora indica* (Burm. f.) Merr.	C	V.N.2130
137		*Wattakaka volubilis* (L.f.) Stapf	C	V.N.2134
138		*Wrightia tinctoria* (Roxb.) R. Br	T	V.N.1624
139	Loganiaceae R. Br. ex Mart.	*Strychnos colubrina* L.	L	V.N.1918
140		*Strychnos nux-vomica* L.	T	V.N.1623
141		*Strychnos potatorum* L. f.	T	V.N.1546
142	Rubiaceae Juss.	*Benkara malabarica* (Lam) Tiruveng.	S	V.N.1137
143		*Canthium coromandelicum* (Burm.f.) Alston	S	V.N.1332
144		*Catunaregam spinosa* (Thunb.) Tirven.	S	V.N.1361
145		*Mitragyna parvifolia* (Roxb.) Korth.	T	V.N.1762
146		*Morinda pubescens* J.E. Smith	T	V.N.1764
147		*Oldenlandia umbellata* L.	H	V.N.1544
148		*Spermacoce hispida* L.	H	V.N.1916
149		*Tarenna asiatica* (L.) Kuntze ex K.Schum.	S	V.N.1923

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	Lamiales Bromhead			
150	Acanthaceae Juss.	*Andrographis paniculata* (Burm.f.) Nees	H	V.N.1423
151		*Barleria prionitis* L.	H	V.N.1135
152		*Blepharis maderaspatensis* (L.) B.Heyne ex Roth	H	V.N.1217
153		*Crossandra infundibuliformis* (L.) Nees	H	V.N.1374
154		*Ecbolium ligustrinum* (Vahl) Vollesen	H	V.N.1746
155		*Justicia tranquebariensis* L.f	H	V.N.1758
156		*Justicia procumbens* L.	H	V.N.1537
157		*Ruellia prostrata* Poir.	H	V.N.1614
158	Bignoniaceae Juss.	*Tecoma stans* (L.) Juss. ex Kunth	T	V.N.1924
159	Lamiaceae Martinov	*Basilicum polystachyon* (L.) Moench	H	V.N.1136
160		*Clerodendrum phlomidis* L. f.	S	V.N.1367
161		*Ocimum cannum* Sims L.	H	V.N.1768
162		*Symphorema involucratum* ROXB.	L	V.N.1919
163		*Vitex altissima* L. f.	T	V.N.2132
164		*Vitex* negundo L.	T	V.N.1934
165	Oleaceae Hoffmanns. and Link	*Jas*minum angustifolium (L.) Willd.	L	V.N.1386
166		*Jasminum auriculatum* Vahl	L	V.N.1756
167	Pedaliaceae R. Br.	*Pedalium murex* L.	H	V.N.1606
168	Scrophulariaceae Juss.	*Scoparia dulcis* L.	H	V.N.1619
169	Verbenaceae J. St.-Hil.	*Gmelina asiatica* L.	S	V.N.1384
170		*Lantana camara* L.	S	V.N.1539
	Solanales Juss. ex Bercht. and J. Presl			
171	Convolvulaceae Juss.	*Convolvulus arvensis* L.	H	V.N.1371
172		*Cuscuta reflexa* Roxb.	P	V.N.1739
173		*Evolvulus alsinoides* L.	H	V.N.1748
174		*Evolvulus nummularis* L.	H	V.N.1536
175		*Ipomea sepiaria* J. Koenig ex Roxb.	C	V.N.1755
176		*Ipomea staphylina* Roem. & Schult.	L	V.N.1385
177		*Merremia tridentata* (L.) Hall.f.	H	V.N.1760
178		*Rivea hypocrateriformis* Choisy	L	V.N.1613
179	Solanaceae Juss.	*Cyperus rotundus* L.	H	V.N.1742
180		*Datura metel* L.	H	V.N.1744
181		*Solanum triflorum* Nutt.	H	V.N.1915
	Unknown Order			
182	Boraginaceae Juss.	*Carmona retusa* (Vahl) Masam.	S	V.N.1241
	CAMPANULIDS			
	Asterales Link			
183	Asteraceae Bercht. and J. Presl	*Cyanthillium cinereum* (L.) H.Rob	H	V.N.1741
184		*Parthenium hysterophorus* L.	H	V.N.1603
185		*Tridax procumbens* L.	H	V.N.2128
C – Climber; H – Herb; S – Shrub; P – Parasite.				