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Research article

Phytosociological studies of the sacred grove of Kanyakumari district, Tamilnadu, India

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Abstract: Sacred groves are forest patches conserved by the local people through religious and cultural practices. These groves are important reservoirs of biodiversity, preserving indigenous plant species and serving as asylum of Rare, Endangered and Threatened (RET) species. The present study was carried out in Muppuram coastal sacred grove of Kanyakumari district to reveal the plant diversity, structure and regeneration pattern of trees using quadrate method. About 102 plant species were recorded from the total area (0.2 ha) of the grove studied. The vegetation of the grove clearly indicates tropical dry evergreen forest. Malvaceae was the dominant family. Young plant species were dominating than older ones (> 160 cm). To avoid the rapid environmental degradation of the sacred grove, conserving the groves is urgent and it is necessary to conduct more researches on this grove as well as other groves of the district.

Keywords: Floristic diversity - Regeneration - Conservation - Sacred groves - Traditional.

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INTRODUCTION

The degradation of tropical forests and destruction of habitat due to anthropogenic activities are the major causes of the decline in global biodiversity (Sukumaran *et al*. 2008, Rabha 2014). Therefore, in many areas conservation of biodiversity and maintaining landscape productivity are being taken up on a priority basis, for the restoration of degraded lands by planting fast-growing indigenous and native plant species (Solbrig 1991). One of the important challenging tasks before the ecologists is to understand the relationship between biodiversity and functioning of ecosystems (Younes 1992, Davis & Richardson 1995). The high rate of extinction of tropical species is aggravated by the clearing of forestland and conversion into agricultural cropland. Harvesting non-timber forest products, selective extraction of plants and animals, biological invasion and monocultural practices are serious threat to biodiversity (Myers 1993, Phillips 1995, Phillips 1997, Sundarapandian & Swamy 1997, Sundarapandian & Swamy 2000, Swamy *et al.* 2000, Mishra *et al.* 2004, Sundarapandian *et al.* 2005, Mehra *et al*. 2014, Rastogi *et al*. 2015, Sarkar & Devi 2017). Reorientation of the psyche of people towards maintaining biodiversity is of utmost importance (Ramakrishnan *et al.* 1998).

Despite the vast and varied flora in Southern Western Ghats, information on the biodiversity of the sacred groves is not explored to a desired level. The past workers such as Raj & Sukumaran (1997), Jeeva *et al.* (2005a, b), Jeeva *et al.* (2006), Prakash *et al.* (2006) have studied phytodiversity of the region. Nayar (1959), Sundarapandian & Swamy (1997), Swamy *et al.* (2000) have paid much attention on forests other than sacred groves of Kanyakumari district. Due to religious beliefs, patches of vegetation are left untouched known as sacred groves. The importance and its conservation status have recently gained more importance, hence several studies have been carried out to evaluate the biodiversity of sacred groves throughout the country (Gadgil & Vartak 1976, Burman 1992, Rodgers 1994, Balasubramanian & Induchoodan 1996, Tripathi 2001, Khumbongmayum *et al.* 2005, Deepa *et al.* 2017). The plant wealth and conservation potential have acknowledged sacred groves as "mini biosphere reserves" (Gadgil & Vartak 1975).

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The survey was largely limited to an enumeration of plants and distribution only neglecting quantitative analysis which is essential for evolving strategies for their conservation. Qualitative studies on plant diversity and conservation status of some sacred groves of Kanyakumari district were studied by Sukumaran and his co-workers (Raj & Sukumaran 1997, Sukumaran & Jeeva 2008, Sukumaran *et al*. 2008). In view of this, the present study was conducted to investigate the plant diversity, structure and regeneration pattern of trees and highlights botanical significance, because of the nature of forest communities largely dependent on the ecological characteristics in sites, species diversity and regeneration status of species.

MATERIALS AND METHODS

Study site

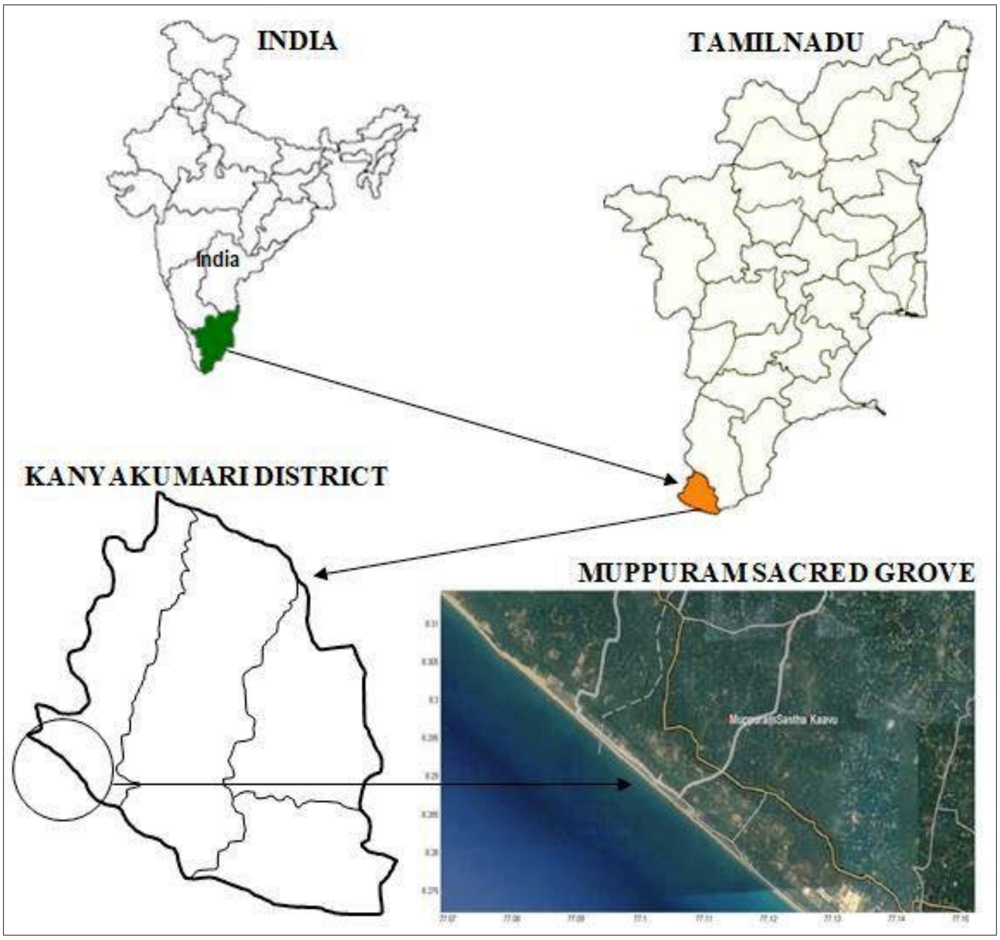

Figure 1. Map of the study area.

The present study was conducted in Muppuram sacred grove of Kollencode town panchayat (08°17′51″N and 77°06′50″ E) of Kanyakumari district, Tamilnadu, India (Fig. 1), which lies close to the boundary of Kerala towards its west. The soil of this grove is sandy because Arabian Sea is just away from this grove. Climate is warm and humid. Rainfall varies from 1030 mm to 3100 mm. The grove is governed by Tamilnadu Devasam board. Tamil and Malayalam are the languages spoken by the people. Christians and Hindus form the sizeable percentage. Nadar is the major community and other communities are Meenavar, Aasari, Chackarevars, Nair, Paravas and Kerala Mudalis. The main deity of this grove is Ayappa and other deities worshipped are Nagaraja, Pillaiyar and Brahma. The mother tree (Sthalavrisha) is *Manilkara hexandra*. Annual festival is celebrated every March for 3 days. Devotees used to do milk and fruit abishekam to the deities. Sweet Pongal will be offered to the deities and then to the devotees. Priest is from Nair community and worship is open to all. A perennial pond is located in the western part of the grove, which has a separate ecosystem enriched with microalgae, aquatic plants, fishes, planktons and so on. Apart from the pond there are two wells, one is inside the grove, the water from this well mostly used for the Poojas and another one is outside where devotees take bath and enter in the grove. The water present in both wells are believed to cure diseases. Migratory birds from Australia come to this grove every year for reproduction.

Vegetation of the grove

The general floristic composition and physiognomy of vegetation of the Muppuram sacred grove resembles low level tropical dry evergreen forest. Undisturbed areas of this grove shows luxuriant vegetation comprising several storeys of trees mixed with shrubs, lianas and herbs. The ground layer is rich in litter and macro fungi and hence the soil is abundant in humus which favors the growth of seasonal members usually thick populated species preferring humus and love shade for growth. Aquatic plants and algae grow gregariously on the perennial pond of the grove. Floristic variations have occurred due to human and animal interferences and also climatic and edaphic changes. The exact physiological implication behind this high humidity is not experimentally proved though it may be described to very high transpiration rate of leaves of these floral elements.

Plant Diversity and Community Attributes

Phytosociological studies were carried out by quadrat sampling method as per Mishra (1968), Kershaw (1973). Twenty quadrats of 10 m × 10 m were randomly laid for trees (≥ 20 cm gbh). Sixty quadrats of 5 m × 5 m each for shrubs and saplings and 60 quadrats of 1 m × 1 m size for studying herbs and seedlings were laid within the same 10 m × 10 m quadrats those were laid for the study of trees. Density (trees ha^{-1}) and basal area values were calculated for each species. Importance value index (IVI) of each species was calculated as per Phillips (1959). Similarly species richness, dominance and diversity were determined by computing the index of species richness (Margalef 1958); Shannon diversity index (Shannon & Weiner 1949); Simpson dominance index (Simpson 1949) and Evenness index (Pielou 1969) were calculated using the formula as given in the reference cited above.

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

$$\text{Density (\%)} = \frac{\text{Total number of individuals of a species}}{\text{Total number of quadrats studied}} \times 100$$

$$\text{Basal cover} = \text{Density} \times \text{Average basal area of individuals of a species}$$

$$\text{Abundance (A)} = \frac{\text{Number of individuals of a species}}{\text{Number of quadrats of occurrences of the species}} \times 100$$

$$\text{Relative Dominance (RDm)} = \frac{\text{Total basal area for a species}}{\text{Total basal area for all species}} \times 100$$

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

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of a species}}{\text{Sum frequencies of all species}} \times 100$$

$$\text{Importance value index (IVI)} = \text{RDm} + \text{RD} + \text{RF}$$

$$\text{Whitford's index} = \frac{\text{Abundance (A)}}{\text{Frequency (F)}} \times 100$$

$$\text{Species richness index (Margalef 1958)} = \frac{\text{S} - 1}{\ln \text{N}}$$

where, S = Total number of species, N = Total number of individuals and ln = log2.

$$\text{Diversity index (Shannon \& Weiner 1949)} \ (H') = \sum_{i=1} pi \ \text{In} \ pi$$

where, *H'* = Shannon–Weiner diversity index, *pi* = Proportion of IVI of a species *i.e.* (*ni / N*).

$$\text{Dominance index (Simpson 1949)(Cd)} = \sum_{i=1}^{S} (pi)^2$$

Species Accumulation Curve

Species accumulation curve was plotted against area for both the plots. After randomizing the samples for 50 times using Estimates (Version 6.0b1, 2000), the Chao1 species number generated for the 0.1 ha subplots (10 m × 10 m) were used to raise the species accumulation curve.

Taxonomic Evaluation

Plants species were collected and identified taxonomically with the help of different floras (Beddome 1868–1874, Gamble & Fischer 1915–1935) and by using field keys devised by Pascal & Ramesh (1987).

The Herbaria of Botanical Survey of India, Southern Circle, Coimbatore; Kerala Forest Research Institute, Peechi; Tropical Botanical Garden and Research Institute, Trivandrum, Kerala and the Department of Botany, Nesamony Memorial Christian College, Marthandam were consulted for correct identification of plant specimens. The nomenclature of species follows the regional flora. Lists of endangered, rare and endemic plants found in the sacred groves were prepared with the help of published works of Ahmedullah & Nayar (1986), Ramesh & Pascal (1991). The voucher specimens were made as per the methods and deposited in the herbarium of Nesamony Memorial Christian College, Marthandam, Kanyakumari, Tamilnadu, India.

RESULTS AND DISCUSSION

Species composition and their distribution pattern

A total of 102 species were identified in 0.2 ha area of the sacred forest studied. Five species remained unidentified, included two species of orchids. Phytodiversity of the recently studied sacred groves from various part of the country shows that a total of 111 species were recorded from four sacred groves of (Ramanujam & Cyril 2003), 180 species were reported from Sendirakillai sacred grove of Cuddalore district, Tamilnadu (Gnanasekaran *et al.* 2012), 94 plant species were recorded from Koraput district, Odisha (Debabrata *et al*. 2014). A total of 245 flowering plants were recorded from Vallikaattu sacred grove of Kozhikode, Kerala (Sreeja & Unni 2016), 119 species, representing 8vulnerable, 12 endemic and 3 near threatened species were reported from Thrissur district, Kerala (Deepa *et al*. 2016). In the study area, trees were distributed in three distinct strata, namely canopy (> 15 m height), sub canopy (8–15 m height) and under canopy (< 8 m height). The canopy layer was composed of *Artocarpus heterophyllus, Artocarpus hirsutus, Ficusbenghalensis, Ficus religiosa* and *Schleichera oleosa*, while *Albizia lebbeck, Hydnocarpus wightianus, Litsea glabrata, Mangifera indica, Strychnos nux-vomica, Swietenia mahagoni* and *Tamarindus indica* constituted subcanopy stratum. *Fla-courtia indica, Drypetes sepiaria, Manilkara hexandra, Magnolia champaca, Morinda coreia, Tamilnadiauliginosa, Santalum album, Semecarpus travancorica, Syzygium densiflorum* and *Vitex negundo* formed the under canopy layer. The undercanopy layer composed of rich vegetation due to overhead canopy layer suppressing the growth of under canopy (Jamir & Pandey 2003). Species richness (number of species per 100 m^2 area) clearly indicated that the community was mosaic of high- and low-diversity fragmented forest (Fig. 2). This appears to be the result of combined effect of non-extreme stable environmental conditions and gap phase dynamics within the forest (Whittaker 1975, Upadhaya *et al*. 2004).

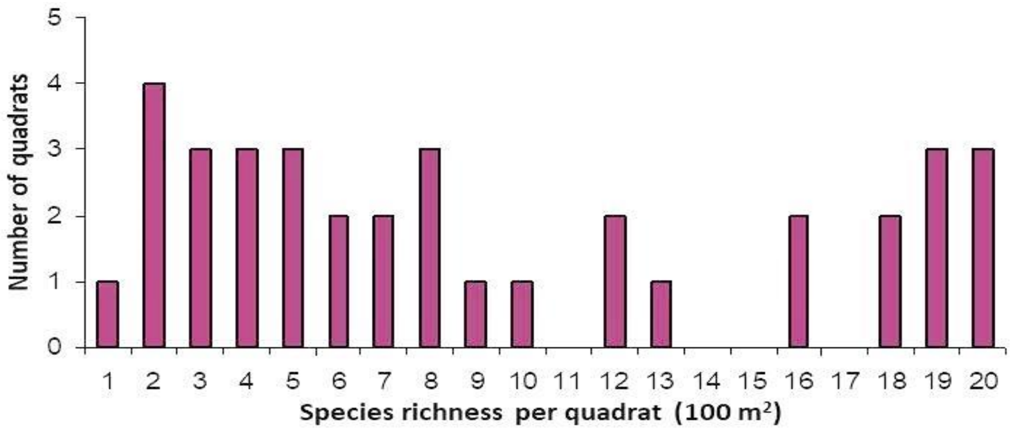

Figure 2. Spatial distribution of tree species richness in the study area.

Table 1. Important value indices (IVI) of plant species recorded in the tropical dry forest fragment of south west coast of Kanyakumari district.

Botanical names	Family	IVI
Trees		
Adenanthera pavonina L.	Leguminosae	12.6
Albizia lebbeck (L.) Benth.	Leguminosae	6.77
Anacardium occidentale L.	Anacardiaceae	9.1
Annona squamosa L.	Annonaceae	2.94
Areca catechu L.	Arecaceae	3.48
Artocarpus heterophyllus Lam.	Moraceae	8.91
Artocarpus hirsutus Lam.	Moraceae	3.89
Buchanania barberi Gamble.	Anacardiaceae	2.62
Carica papaya L.	Caricaceae	1.75
Cocos nucifera L.	Arecaceae	3.89
Drypetes sepiaria (Wight & Arn.) Pax & K. Hoffm.	Putranjivaceae	49.5
Ficus benghalensis L.	Moraceae	24.58
Ficus religiosa L.	Moraceae	7.6
Flacourtia indica (Burm.f.) Merr.	Salicaceae	7.63
Gliricidia sepium (Jacq.) Walp.	Leguminosae	23.48
Glycosmis pentaphylla (Retz.) DC.	Rutaceae	3.41
Hydnocarpus wightianus Blume	Achariaceae	3.71
Litsea glabrata Hook.f.	Lauraceae	2.31
Magnolia champaca (L.) Baill. ex Pierre	Magnoliaceae	3.1
Mangifera indica L.	Anacardiaceae	2.73
Manilkara hexandra (Roxb.) Dubard	Sapotaceae	25.19
Morinda coreia Buch.-Ham.	Rubiaceae	21.28
Phyllanthus emblica L.	Phyllanthaceae	1.97
Psidium guajava L.	Myrtaceae	1.73
Santalum album L.	Santalaceae	6.33
Schleichera oleosa (Lour.) Merr.	Sapindaceae	12.04
Semecarpus travancorica Bedd.	Anacardiaceae	1.78
Sterculia foetida L.	Malvaceae	1.78
Sterculia guttata Roxb. ex G.Don	Malvaceae	1.76
Strychnos nux-vomica L.	Loganiaceae	3.8
Swietenia mahagoni (L.) Jacq.	Meliaceae	2.2
Syzygium densiflorum Wall. ex Wight & Arn.	Myrtaceae	1.89
Tamarindus indica L.	Leguminosae	12.92
Tamilnadia uliginosa (Retz.) Tirveng. & Sastre	Rubiaceae	17.8
Thespesia populnea (L.) Sol. ex Correa	Malvaceae	1.78
Vitex negundo L.	Lamiaceae	1.76
Shrubs		
Barleria prionitis L.	Acanthaceae	17.08
Breynia retusa (Dennst.) Alston.	Phyllanthaceae	11.18
Bryophyllum pinnatum (Lam.) Oken	Crassulaceae	9.4
Calotropis gigantea (L.) Dryand.	Apocynaceae	11.5
Carissa spinarum L.	Apocynaceae	8.36
Citrus aurantiifolia (Christm.) Swingle	Rutaceae	11.62
Ehretia microphylla Lam.	Boraginaceae	17
Euphorbia antiquorum L.	Euphorbiaceae	10.64
Gardenia resinifera Roth	Rubiaceae	16.94
Hibiscus rosa-sinensis L.	Malvaceae	17.44
Ixora brachiata Roxb.	Rubiaceae	18.3
Lantana camara L.	Verbenaceae	25.88
Nerium oleander L.	Apocynaceae	7.17
Ochna obtusata DC.	Ochnaceae	32.67
Ophiorrhiza mungos L.	Rubiaceae	30.67
Opuntia dillenii (Ker Gawl.) Haw.	Cactaceae	14.52
Pavetta zeylanica (Hook,f.) Gamble	Rubiaceae	24.54
Tabernaemontana alternifolia L.	Apocynaceae	15.1

Climbers (including Lianas)		
Abrus precatorius L.	Leguminosae	9.41
Bridelia stipularis (L.) Blume	Phyllanthaceae	12.69
Cadaba fruticosa (L.) Druce	Capparaceae	1.53
Cansjera rheedii Blanco	Opliaceae	4.53
Capparis divaricata Lam..	Capparaceae	4.79
Capparis sepiaria L.	Capparaceae	8.36
Capparis zeylanica L.	Capparaceae	0.68
Carissa spinarum L.	Apocynaceae	1.73
Cayratia japonica (Thunb.) Gagnep.	Vitaceae	4.9
Cissampelos pareira L.	Menispermaceae	34.84
Cissus vitiginea L.	Vitaceae	3.53
Grewia serrulata DC.	Malvaceae	7.94
Hugonia serrata Lam.	Linaceae	18.38
Jasminum angustifolium (L.) Willd.	Oleaceae	11.62
Morinda umbellata L.	Rubiaceae	0.84
Pueraria montana var. *lobata* (Willd.) Sanjappa & Pradeep.	Vitaceae	3.79
Pyrenacantha volubilis Hook.	Icacinaceae	8.05
Strychnos colubrina Blume.	Loganiaceae	26.32
Tetracera akara Merr.	Dilleniaceae	11.83
Tetrastigma canarense (Dalziel) Gamble	Vitaceae	6.15
Uvaria narum A.DC.	Annonaceae	10.57
Ziziphus oenopolia (L.) Mill.	Rhamnaceae	7.52
Herbs		
Aerva lanata (L.) Juss.	Amaranthaceae	1.41
Andrographis paniculata (Burm.f.) Nees	Acanthaceae	6.43
Apluda mutica L.	Poaceae	11.05
Blepharis maderaspatensis (L.) B.Heyne ex Roth	Acanthaceae	9.04
Boerhavia diffusa L.	Nyctaginaceae	4.69
Ceropegia spiralis Wight	Apocynaceae	2.88
Commelina benghalensis L.	Commelinaceae	2.54
Commelina erecta L.	Commelinaceae	4.22
Dendrobium macrostachyum Lindl.	Orchidaceae	4.22
Eragrostis amabilis (L.) Wight & Arn.	Poaceae	15.94
Eragrostis patula (Kunth) Steud.	Poaceae	10.46
Gloriosa superba L.	Colchicaceae	4.29
Hemidesmus indicus (L.) R.Br. ex Schutt.	Apocynaceae	5.49
Justicia japonica Thunb.	Acanthaceae	5.02
Justicia tranquebariensis L.f.	Acanthaceae	1.41
Knoxia sumatrensis (Retz.) DC.	Rubiaceae	1.14
Microstachys chamaelea (L.) Mull.Arg.	Euphorbiaceae	4.62
Mimosa pudica L.	Leguminosae	2.01
Ocimum tenuiflorum L.	Lamiaceae	2.28
Oplismenus compositus (L.) P.Beauv.	Poaceae	7.91
Perotis indica (L.) Kuntze	Poaceae	23.33
Plumbago zeylanica L.	Plumbaginaceae	1.74
Sansevieria roxburghiana Schult. & Schult.f.	Asparagaceae	64.61
Sida acuta Burm.f.	Malvaceae	1.41
Sida cordifolia L.	Malvaceae	0.87
Waltheria indica L.	Malvaceae	1

Taxonomically, a total of 102 plant species belonging to 90 genera and 46 families were recorded in the sacred forest (representative of tropical dry evergreen forest fragment of the southwest coast of Kanyakumari district) studied (Table 1). Among these, 36 (35.29%) were trees, 18 (17.65%) shrubs, 26 (25.49%) herbs, and 22 were (21.57%) climbers including lianas. In the tropical dry evergreen forest, Malvaceae and Rubiaceae was the dominant family with 8 species followed by Apocynaceae (7 species), Leguminosae (6 species), Acanthaceae and Poaceae (5 species each), Anacardiaceae, Capparaceae, Moraceae and Vitaceae (4 species each) were well represented in the study area. Phyllanthaceae was represented by three species, followed by 8 family of two species each, whereas 28 families were monospecific (Fig. 3).

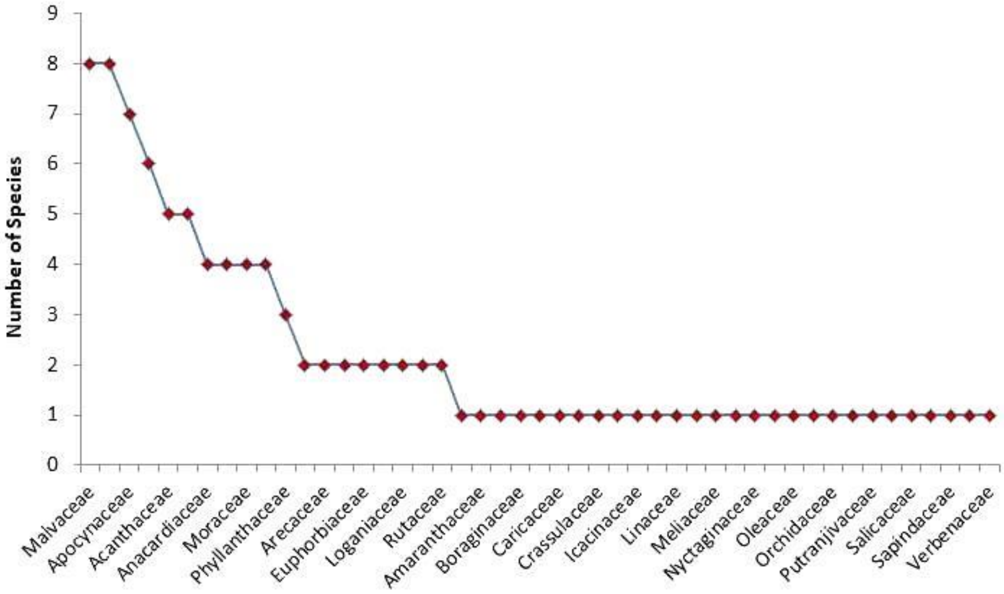

Figure 3. Dominance - distribution pattern of families in the study area.

In the present study, the majority of species (17 spp. 20–40 cm dph; 13 spp. 40–60 cm dph; 15 spp. 60–80cm dph) were represented by young individuals and species richness decreased with increase in dbh class, except in the case of mature trees beyond > 180 cm dbh (Fig. 4). In case of distribution pattern, the majority of the species showed a clumped distribution pattern and only 6–10% of the species were randomly distributed in the forest (Fig. 5). The clumpy vegetation is due to the canopy gaps forming a major source of disturbance (Armesto *et al*. 1986).

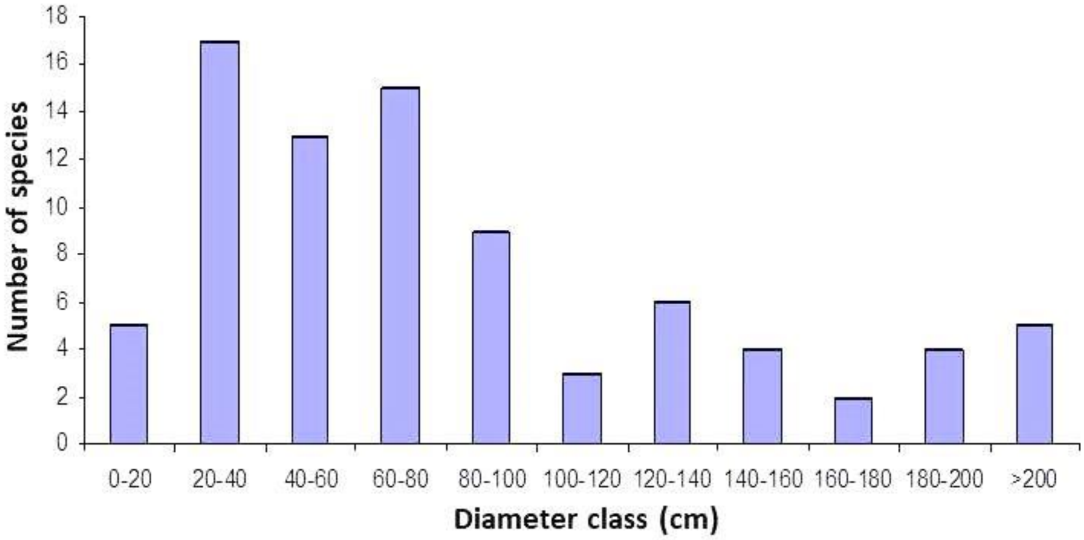

Figure 4. Distribution of species in different diameter classes in the study area.

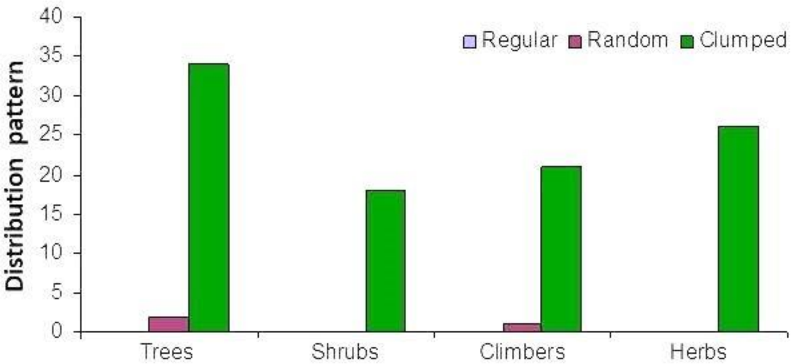

Figure 5. Distribution pattern of plant species in the study area.

Density and basal cover

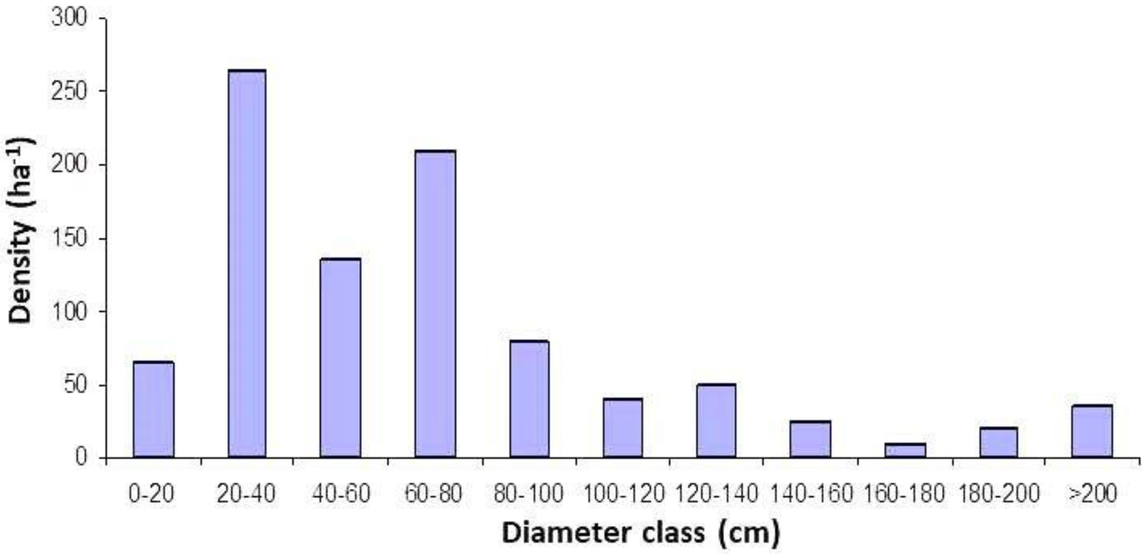

Figure 6. Distribution of density in different diameter classes in the study area.

Distribution of density in different girth classes is shown in figure 6. In the sacred forest, 65.24% of the stem was in the 20–60 cm dbh class and only 2.67 % in 140–160, 1.07 % in 160–180, 2.14% in 180–200 and 3.74% in > 200 cm dbh classes respectively (Fig. 6). The study was more or less similar to the report of Upadhaya *et al*. (2004) which showed a maximum density of species in 515 cm dph classes. In Muppuram, 935 individuals of tree species encountered, nearly 50 percent of the species were represented by one or two stems. *Drypetes sepiaria* had the maximum number of individuals (135 stems), *Manilkara hexandra* (95 stems), *Morinda coreia* (80 stems), *Tamilnadia uliginosa* (75 stems), *Adenanthera pavonina* (50 stems), *Tamarindus indica* (40 stems) (Fig. 7). In the study area the density of young trees (20–40 cm dbh) was much greater compared to the mature trees (> 160 cm dbh). However, despite this, the basal cover of young trees was much lower than that of mature trees (0.07 versus 31.05 $m^2.ha^{-1}$). A sharp decrease in density with the increase in girth classes was reported from the sacred groves of Manipur (Khumbongmayum *et al*. 2005). The reports of Johnston & Gillman (1995) in Kurupukari sacred grove; Valencia *et al*. (1994) in Amazonian Ecuador; Jamir (2000) in subtropical humid forest in Jaintia hills, Meghalaya; Pascal & Pelissier (1996), Parthasarathy & Karthikeyan (1997) in the sacred groves of Western Ghats also evaluated the same. *Drypetes sepiaria* was one of the dominant species in the study area and similar report was given by Sundarapandian & Subbiah (2015) in tropical dry evergreen forests in Sivagangai district, Tamilnadu.

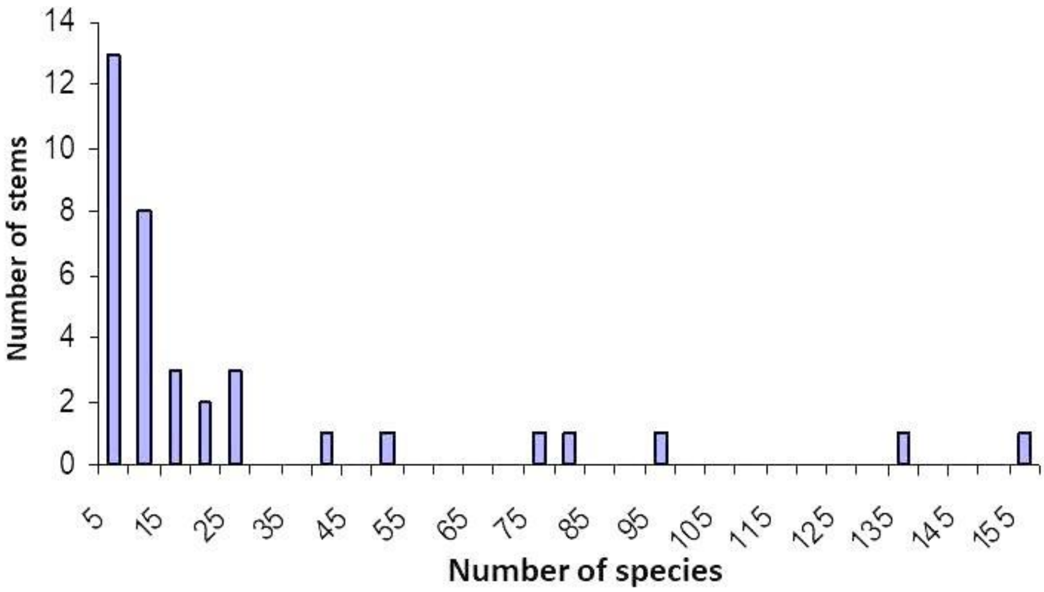

Figure 7. Species stem relationship in a hectare area of the sacred grove.

Shannon-Weiner Diversity Index value was estimated to be 2.92 for trees, 2.72 for shrubs, 2.72 for climbers and 2.54 for herbs. Simpson's Dominance Index values for trees, shrubs, climbers and herbs were found to be 0.08, 0.08, 0.09, and 0.13 respectively. The estimated Species Evenness Index value was 0.81 for trees, 0.94 for shrubs, 0.88 for climbers and 0.78 for herbs. Whitaker Index values for trees, shrubs, climbers and herbs were calculated to be 6.88, 3.05, 3.41 and 3.93 (Table 2). High diversity and low Simpson's dominance value is due to human interferences. Similar statement was given by Parthasarathy *et al*. (1992), Visalakshi (1995) and Rampilla (2015) in the sacred groves of southern Western Ghats, tropical evergreen forest and Indrakiladri sacred grove.

Table 2. Density, basal area, dominance, diversity and evenness indices of plant species in the study area.

Variable	Trees	Shrubs	Climbers	Herbs
Density (ha^{-1})	925	1845	78750	931250
Basal area ($m^2.ha^{-1}$)	132.52	0.34	-	-
Shannon's diversity index	2.92	2.72	2.72	2.54
Pielou's evenness index	0.81	0.94	0.88	0.78
Simpson's dominance index	0.08	0.08	0.09	0.13
Whittaker index	6.88	3.05	3.41	3.93

Dominance distribution pattern of Tree species

The dominance distribution yielded log-normal curves showing a high equitability and low dominance in the Muppuram forest (Fig. 8). The same curve was reported by Mishra *et al*. (2004) in the sacred grove of Meghalaya. This is because of the stability of the community. *Drypetes sepiaria* (IVI = 40.50) and *Manilkara hexandra* (IVI = 25.19) was the dominant and co-dominant species respectively, whereas *Psidium guajava* (IVI = 1.73) was the least dominant species of the study area.

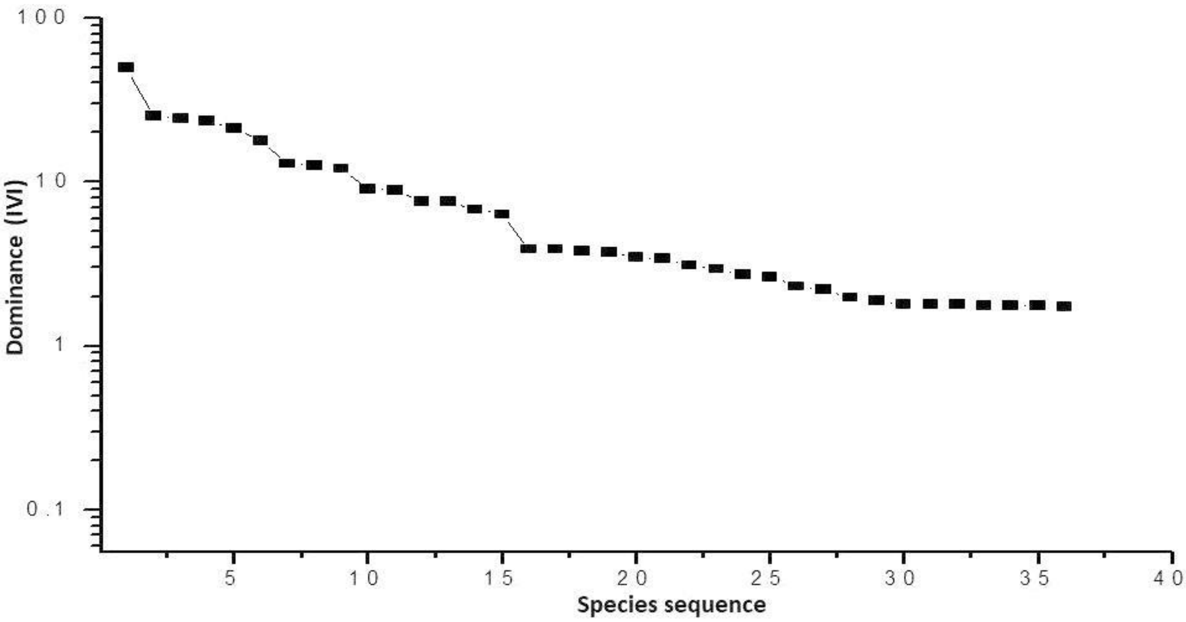

Figure 8. Dominance - diversity curves of trees in the study area.

CONCLUSION

A discussion on the tropical dry evergreen forest would be complete without assessing their present and future prospects. The analysis reveals the dominance of belief system over the preservation of grove proper. Signs of human impacts are unmistakable and vary in extent, viz. conversion into coconut based agroforestry system, ornate temple construction etc. The introduction of non-grove species, though observed only in two plots, is ominous at its bound to alter the native species composition. In conclusion, the present study has documented the prevalence of the sacred forest among the agricultural/urban societies. It further confirms that these forests have managed to survive up to the modern times but are struggling for survival now. Despite their alarming conservation status, the biodiversity conserved in them is significantly rich, varied and valuable.

Rappaport (1971) argued that the human societies have employed the concept of sacred to mould human behavior where the interests of the individual clash with those of forest/grove as a whole. In his opinion, the sacred forest is represented the ecological prudence against the profligacy of individuals. The study reveals that the very state belief system, which was scrupulously evolved to foster the biodiversity conservation, has initiated its nemesis too. Unless urgent and stem measures are taken, the time is not far-off that the "mini biosphere reserves" will turn to the "relicts of dying wisdom".

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