



Floristic diversity and phytosociological studies of selected area in Ariyalur district, Tamil Nadu, India

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Abstract

Assessment on the floristic diversity in Karuppusamy sacred grove near Thathanur in the Ariyalur district of Tamil Nadu, India, was carried out during 2020-2021. In the study, a total of 121 plant species were recorded belonged to 104 genera distributed among 50 families, are Angiosperms. Fabaceae (8 species) is a dominant family followed by Asclepiadaceae, Mimosaceae (7 species), Euphorbiaceae, (6 species), and 5 species each from Rubiaceae and Poaceae. The diversity indices namely the Shannon-Weiner index, Simpson index, and evenness index, etc., were analyzed.

Keywords: sacred groves, angiosperms, diversity indices

Introduction

Biodiversity is the dissimilarity of life forms within a given ecosystem, biome, or for the whole earth. This entirety in the origin of species and ecosystems provides the basis of life on earth. (Reid and Miller *et al.*, 1989). Biodiversity is the “Totality of genes, species, and ecosystem of a region”. It plays a significant role in maintaining the entire earth. Besides this significant contribution, it also provides a socio-economic and monetary asset to the nation. The only means to rectify the loss is to achieve conservation of biological diversity, as in the case of protected areas wherein the aspect deals with reintroducing some species, restored the ecosystem, and managing or eradicating previously introduced plants and animals. Biodiversity is the very basis of human survival and economic well-being and encompassed all life forms, ecosystems, and ecological processes, acknowledge the hierarchy at genetic, taxon, and ecosystem levels (McNeely *et al.*, 1990). Apart from the ethical and aesthetics, biodiversity provides to humankind enormous direct economic benefits in the form of timber, food, fiber, industrial enzymes, food flavors, fragrances, cosmetics, emulsifiers, dyes, plant growth regulators, and pesticides Mannion (1995) ^[11]; (Costanza *et al.*, 1997) ^[1].

Sacred groves are temple forests or patches of natural climax forests preserved as a product of the above described beliefs by the local people. (Gadgil and vartak, *et al.*, 1975) ^[4]. Declaring a scrap of forest near the villages as sacred and protecting it on the grounds of spiritual and cultural beliefs is a venerable practice with the ethnic community in the northeastern hill region of India. Thousands of sacred groves are found in India. They occur chiefly in Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu. (Britto *et al.*, 2001) ^[7].

These sacred groves through reality in the area while time immemorial and are considered to be the historical object of the original forest vegetation of the region. These are among the few least disturbed forest patches in the region that serve as the original wealth accommodation of biodiversity. The sacred groves are actually rich in floral and faunal rudiments. The species satisfied in these sacred groves are incredibly high. The sacred groves hold numerous valuable medicinal and other economically significant plants. The important conservative uses of sacred groves were that they acted as a repository for a range of Ayurvedic medicines.

The groves are frequently connected with ponds, streams and meet the water necessities of local communities they sometimes help in recharging aquifers as well. A lot of groves are looked upon as houses of Hindu gods. In the recent past, a number of them have been partially cleared for the construction of shrines and temples. A massive number of separate local art forms and folk traditions are associated with the deities of sacred groves and are an important cultural aspect closely connected with sacred civilization. The sacred groves in India can be classified under three categories.

Material and Methods

Study area

The study area Karuppusamy kovil Thathanur village, located at Udayarpalayam taluk, Ariyalur district, Tamil Nadu. Located at a distance of 310 km from the state capital Chennai. It is bounded on the north by Cuddalore, south by Thanjavur and west by Perambalur and Tiruchirappalli districts. Its geographical limit is 11.1360°N Latitude, 79.2352°E longitude, with elevation ranging 83m altitude above mean sea level an inland

district without any coastline. The district has Velar River in the north Kollidam River in the south. Despite the human activity within its premises, the site is well protected and conserved since it is revered as sacred.

Methodology

The sacred grove is spread over 2 ha with the Karuppusamy kovil in the midst. The patch was randomly sampled with 10 (10x10) m workable quadrates. Within each quadrate all individuals' species of trees (with girth \geq 30cm) and shrubs GBH (girth at breast height) were measured and noted in field note. Herbs and seedlings were studied in 1x1 meter quadrates. The data are documented in a field note. The segments were visited repeatedly. The collected specimens were identified and systematic enumeration was made with available monographs, relevant works of literature, and taxonomic revisions (Gamble 1935; Mathew, 1982) [5]. For phytosociological studies, the parameters like density, relative density, abundance, percentage frequency, relative frequency, relative basal area and importance value index (IVI) were estimated by using standard procedures (Magurran, 1988; Gopikumar *et al.*, 2005) [10,6]. Plant species associations were found out by using the following formulae:

$$1. \text{ Density} = \frac{\text{Total number of individuals of a species in all quadrates}}{\text{Total number of quadrates studied}}$$

$$2. \text{ Frequency (\%)} = \frac{\text{Number of quadrates in which the species occurred}}{\text{Total number of quadrates studied}} \times 100$$

$$3. \text{ Abundance} = \frac{\text{Total number of individuals of a species in all quadrates}}{\text{Total number of quadrates in which the species occurred}}$$

$$4. \text{ Relative density} = \frac{\text{The number of individuals of the species}}{\text{The number of individuals of all the quadrates}} \times 100$$

$$5. \text{ Relative frequency} = \frac{\text{The number of occurrences of the species}}{\text{The number of individuals of all the species}} \times 100$$

$$6. \text{ Relative dominance} = \frac{\text{The total basal area of the species}}{\text{The total basal area of all the species}} \times 100$$

$$7. \text{ Basal Area (BA)} = (P^2 \times 4\pi) \times 10,000 \text{ m}^2$$

$$8. \text{ The species richness was calculated by 'Margalefs Index of richness' (D}_{mg}) \text{ (Magurran, 1988) [10]}$$

$$9. \text{ Shannon wiener index (H)} = -\sum P_i \times \log_2 \text{ of } P_i$$

$$10. \text{ Simpson's index } (\lambda) = \sum P_i^2$$

$$11. \text{ Evenness index (E) (pielou 1966)} = E = H/\log s$$

$$11. \text{ Important value index (IVI)} = R.D + R.F + R.BA$$

Results and Discussions

Floristic Composition

The data collected during the field sampling are tabulated and consolidated separately for trees, shrubs, herbs and climbers. (Tables-1to3). In the present study of 121 species were recorded belonging to 104 genera distributed among 50 families belong to the angiosperms. The present study showed more number of plant species than the phytosociological studies of sacred groves, in Pudukottai district, Tamilnadu India (Vinothkumar *et al.*, 2011). Among them, Fabaceae (8sps.) is a dominant family followed by Asclepiaceae (7sps.), Mimosaceae (7sps.), Asteraceae, Amaranthaceae and Euphorbiaceae (6 sps. each.), Poaceae, and Rubiaceae, (5sps.each). Caesalpiniaceae, Cucurbitaceae, Lamiaceae, and Malvaceae (4 sps. each). The remaining families contribute a single species each. This study shows about 22% (27) tree species, 19% (23) shrub species and 41% (49) herbaceous species and 18% (22) climbers (Fig.2). This number of individuals is relatively equal when compared to the floristic composition on the selected sacred groves of the Perambalur district (Rajkumar *et al.*, 2014). In a similar study, Parthasarathy *et al.* (2008) [18] enumerated 102 trees and 47 lianas from 75 groves in the Pudukottai district itself. Floristic study of vegetation is important to determine the distribution of food plants for wildlife (Ejtehad *et al.*, 2005) [13]. Several studies concerning floristic inventory were reported includes

260 species in 176 genera and 62 families from Malliganatham (John Britto *et al.*, 2001) [7]. Thus, floristic diversity assessment of vegetation composition, understand species richness and diversity patterns is fundamental for conservation of these natural areas (Zhang *et al.*, 2013) [28].

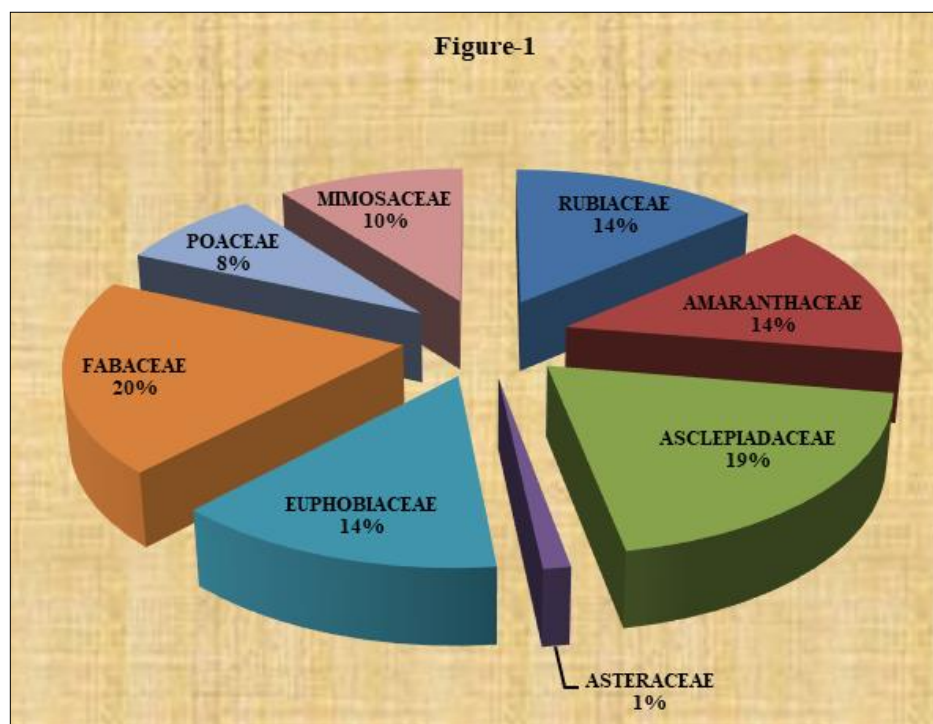


Fig 1: Predominant family-wise distribution of species in Thathanur village sacred grove

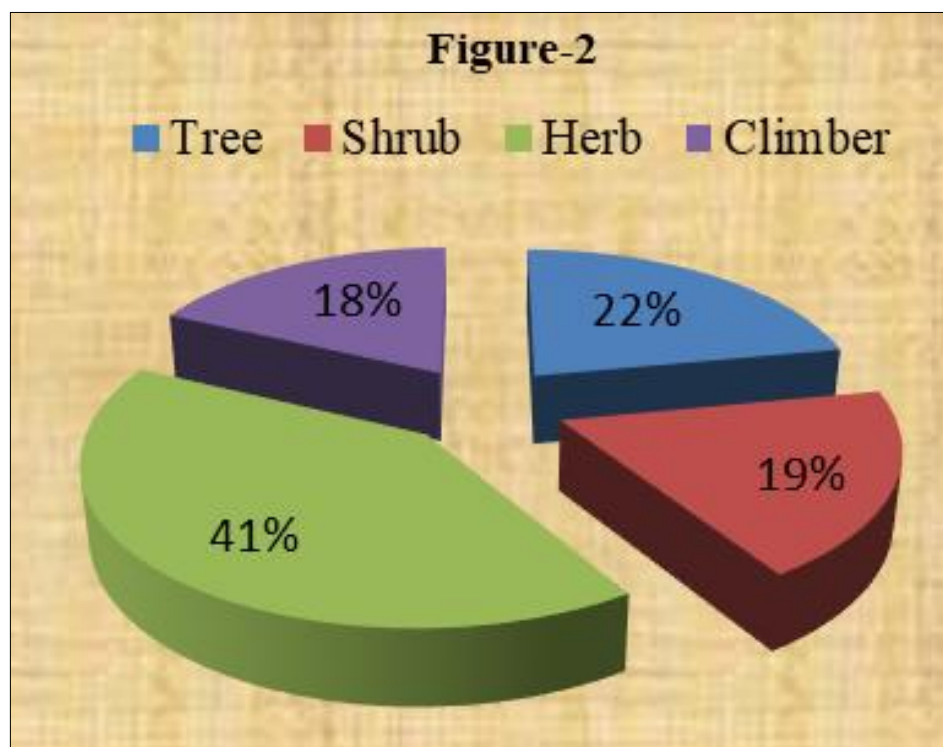


Fig 2: Habit-wise percentage of plants species in Thathanur village sacred grove.

Phyto-sociological studies

Density, Frequency, Abundance, and Basal area

The sacred grove is mostly covered by deciduous species whose *Ailanthus excelsa* (1.30) had the highest density. The other frequency and abundance values are *Ailanthus excelsa* (50), *Cassia fistula* (40), *Alangium salvifolium*, *Albizia amara* (each 30), and the small tree *Atalantia racemosa* (10) have contributed the highest frequency values. The abundant tree species encountered in the study area are *Prosopis juliflora* (4.0) followed by *Alangium salvifolium* (3.0) and the six species *Azadirachta indica*, *Strychnos nux-vomica*, *Tamarindus indica*,

Wattakaka volubilis, *Derris scandens* and *Ziziphus mauritina* contributed the medium abundance value (2.0) of the study area. A similar report made a study on woody vegetation structure in a sacred grove of Pudukkottai district (Muthukumar *et al.*, 2005) [16].

The other tree species contributed the lowest abundance value 1.0 to 1.5. Species contribution to the total basal area 4.446 m² (109 indiv.) is shown in the table. *Ailanthus excelsa* (1.22 m²) is the highest contributor followed by *Tamarindus indica* (0.63m²) (Plate-5) and *Alangium salvifolium* (0.531m²) *Albizia amara* community proposed for dry evergreen forest type by (Meher Homji, 1973) is applicable. It was low compared to the basal area contribution of Pondicherry, where the total basal area was 4.09 (Ramanujam *et al.*, 2003) [21].

In the shrub (23) species *Abutilon indicum* (2.4) and *Abutilon hirtum*, *Lantana camara* (1.2) (Plate-9) contributed the highest density values followed by *Benkara malabarica* and *Capparis divaricata* showed the dense value (0.9) respectively. *Abutilon indicum*, *Capparis divaricata* (50) followed by *Benkara malabarica* (40), *Abutilon hirtum*, *Carrissa spinarum*, *Jatropha curcus*, *Lantana camara*, and *Sida acuta* (each 30) contributed the highest frequency value.

Among the herbaceous 49 species covered by the sacred grove, were *Anisomeles indica* (5.40) followed by *Aristida adscensionis* (4.70) and *Aerva lanata* (4.30) have showed highest density values. *Achyranthes aspera* (100) followed by *Croton bonplandianus* (80), *Anisomeles indica*, *Chloris virgata*, (90) and *Aerva lanata* (70) contributed the highest frequency value.

The climber 22 species like *Cardiospermum halicacabum* (1.50), *Citrullus colocynthis* (0.20), and *Mukia maderaspatana* (1.10) having high density and lowest value *Solena amplexiculis* (0.10). *Cardiospermum halicacabum*, *Citrullus colocynthis*, and *Hemidesmus indicus* (40) contributed the highest frequency.

Important Value Index (IVI) Analysis

Among the tree species, *Ailanthus excelsa* had (48.13) important value index (IVI) was very high followed by *Alangium salviifolium* (25.46) and *Borassus flabellifer* (23.39) (Table -4). The important value index (IVI) combines relative frequency, relative density, and relative dominance and this measure can be used to indicate the ecological influence of each species in the forest (Khamyong *et al.*, 2004).

Table 1: Structural diversity aspects of tree species in sacred grove of thathanur village, Ariyalur district.

Species Name	AB	DEN	RD	FQ	RF	BA	RDO	IVI
<i>Acacia leucophloea</i> (Roxb.) Willd.	1.00	0.10	0.92	10	1.754	0.0306	0.6882	3.36
<i>Acacia nilotica</i> (L.) Willd.	1.50	0.30	2.75	20	3.509	0.0019	0.0427	6.30
<i>Ailanthus excelsa</i> Roxb.	2.60	1.30	11.93	50	8.772	1.22	27.4361	48.13
<i>Alangium salviifolium</i> (L.f.) Wang.	3.00	0.90	8.26	30	5.263	0.531	11.9414	25.46
<i>Albizia amara</i> (Roxb.) Boivin	1.67	0.50	4.59	30	5.263	0.0484	1.0884	10.94
<i>Albizia lebeck</i> (L.) Benth.	1.00	0.20	1.83	20	3.509	0.062	1.3943	6.74
<i>Atalantia monophylla</i> (L.) Correa	1.00	0.10	0.92	10	1.754	0.028	0.6297	3.30
<i>Azadirachta indica</i> Adr.Juss.	2.00	0.40	3.67	20	3.509	0.0245	0.5510	7.73
<i>Borassus flabellifer</i> L.	2.33	0.70	6.42	30	5.263	0.5206	11.7076	23.39
<i>Cassia fistula</i> L.	1.50	0.60	5.50	40	7.018	0.0261	0.5870	13.11
<i>Cassine glauca</i> (Rottb.) Kuntze	1.50	0.30	2.75	20	3.509	0.023	0.5172	6.78
<i>Chloroxylon swietenia</i> DC.	2.00	0.40	3.67	20	3.509	0.0345	0.7759	7.95
<i>Derris scandens</i> (Roxb.) Benth.	2.00	0.20	1.83	10	1.754	0.0023	0.0517	3.64
<i>Euphorbia antiquorum</i> L.	2.00	0.40	3.67	20	3.509	0.0389	0.8748	8.05
<i>Ficus benghalensis</i> L.	1.00	0.10	0.92	10	1.754	0.24	5.3973	8.07
<i>Lannea coromandelica</i> (Houtt.) Merr.	1.00	0.20	1.83	20	3.509	0.0129	0.2901	5.63
<i>Madhuca longifolia</i> (L.) Macbr.	1.00	0.10	0.92	10	1.754	0.0063	0.1417	2.81
<i>Morinda pubescens</i> Smith.	2.33	0.70	6.42	30	5.263	0.0071	0.1597	11.84
<i>Pithecellobium dulce</i> (Roxb.) Benth.	1.00	0.10	0.92	10	1.754	0.0666	1.4977	4.17
<i>Prosopis juliflora</i> (Sw.) DC.	4.00	1.20	11.01	30	5.263	0.24	5.3973	21.67
<i>Strychnos nux-vomica</i> L.	2.00	0.60	5.50	30	5.263	0.12	2.6986	13.47
<i>Syzygium cumini</i> (L.) Skeels	1.00	0.20	1.83	20	3.509	0.1151	2.5884	7.93
<i>Tamarindus indica</i> L.	2.00	0.20	1.83	10	1.754	0.63	14.1678	17.76
<i>Tectona grandis</i> L.f.	1.33	0.40	3.67	30	5.263	0.0965	2.1701	11.10
<i>Thespesia populnea</i> (L.) Sol.	1.00	0.10	0.92	10	1.754	0.3075	6.9152	9.59
<i>Wattakaka volubilis</i> (L.f.) Stapf	2.00	0.20	1.83	10	1.754	0.0061	0.1372	3.73
<i>Ziziphus mauritiana</i> Lam.	2.00	0.40	3.67	20	3.509	0.0068	0.1529	7.33

Table 2: Structural diversity aspects of shrub species in sacred grove of Thathanur village, Ariyalur district.

Species Name	AB	DE	RD	FQ	RF
<i>Abutilon hirtum</i> (Lam.) Sweet	4.00	1.20	9.02	30	5.882
<i>Abutilon indicum</i> (L.) Sweet	4.80	2.40	18.05	50	9.804

<i>Adhatoda zeylanica</i> Medic.	2.00	0.20	1.50	10	1.961
<i>Allophylus serratus</i> (Roxb.) Kurz	2.50	0.50	3.76	20	3.922
<i>Benkara malabarica</i> (Lam.)Tirv.	2.25	0.90	6.77	40	7.843
<i>Cadaba fruticosa</i> (L.) Druce	2.00	0.40	3.01	20	3.922
<i>Calotropis gigantea</i> , (L.) R.Br.	1.50	0.30	2.26	20	3.922
<i>Canthium coromandelicum</i> (Burm.f) Alst.	4.00	0.80	6.02	20	3.922
<i>Capparis divaricata</i> Lam.	1.80	0.90	6.77	50	9.804
<i>Carrissa carandas</i> L.	1.50	0.30	2.26	20	3.922
<i>Carrissa spinarum</i> L.	1.67	0.50	3.76	30	5.882
<i>Cassia auriculata</i> L.	2.50	0.50	3.76	20	3.922
<i>Catunaregam spinosa</i> (Thunb.)Tirveng.	1.00	0.10	0.75	10	1.961
<i>Clausena dentata</i> (Willd.) Roemer	2.00	0.20	1.50	10	1.961
<i>Euphorbia tirucalli</i> L.	4.00	0.40	3.01	10	1.961
<i>Flueggea leucopyrus</i> Willd.	2.50	0.50	3.76	20	3.922
<i>Grewia abutilifolia</i> Vent.ex Juss.	3.00	0.30	2.26	10	1.961
<i>Jatropha curcus</i> L.	2.00	0.60	4.51	30	5.882
<i>Lantana camara</i> L.	4.00	1.20	9.02	30	5.882
<i>Nerium oleander</i> L.	1.00	0.10	0.75	10	1.961
<i>Opuntia stricta</i> Haw.	2.00	0.20	1.50	10	1.961
<i>Sida acuta</i> Burm.f	2.33	0.70	5.26	30	5.882
<i>Vitex trifolia</i> L.	1.00	0.10	0.75	10	1.961

Table 3: Structural diversity aspects of herb species in sacred grove of Thathanur village, Ariyalur district.

Species Name	AB	DE	RD	FQ	RF
<i>Acalypha indica</i> L.	4.00	1.20	1.78	30	2.344
<i>Acanthospermum hispidum</i> DC.	4.83	2.90	4.31	60	4.688
<i>Achyranthes aspera</i> L.	3.80	3.80	5.65	100	7.813
<i>Aerva lanata</i> (L.) Juss.	6.14	4.30	6.39	70	5.469
<i>Aeschynomene aspera</i> L.	2.00	0.20	0.30	10	0.781
<i>Ageratum conyzoides</i> L.	2.00	0.40	0.59	20	1.563
<i>Allmania nodiflora</i> (L.) R. Br.	6.00	1.20	1.78	20	1.563
<i>Alternanthera sessilis</i> (L.) R.Br.	5.67	3.40	5.05	60	4.688
<i>Alysicarpus bupleurifolius</i> (L.) DC.	2.00	0.20	0.30	10	0.781
<i>Amaranthus spinosus</i> L.	4.67	1.40	2.08	30	2.344
<i>Amaranthus viridis</i> L.	4.00	0.40	0.59	10	0.781
<i>Ammannia baccifera</i> L.	6.67	2.00	2.97	30	2.344
<i>Anisomeles indica</i> (L.) O.Kuntze	7.71	5.40	8.02	70	5.469
<i>Anisomeles malabarica</i> R.Br. ex Sims	6.00	1.20	1.78	20	1.563
<i>Argemone mexicana</i> L.	2.00	0.20	0.30	10	0.781
<i>Aristida adscensionis</i> L.	15.67	4.70	6.98	30	2.344
<i>Aristida hystrix</i> L.f.	12.00	1.20	1.78	10	0.781
<i>Asclepias curassavica</i> L.	2.00	0.20	0.30	10	0.781
<i>Bacopa monnieri</i> (L.) Pennell	6.00	0.60	0.89	10	0.781
<i>Barleria prionitis</i> L.	2.00	0.20	0.30	10	0.781
<i>Blepharis maderaspatensis</i> (L.) Roth	3.50	0.70	1.04	20	1.563
<i>Boerhavia diffusa</i> L.	23.00	2.30	3.42	10	0.781
<i>Caralluma adscendens</i> (Roxb.) Haw.	1.00	0.10	0.15	10	0.781
<i>Cassia tora</i> L.	9.00	0.90	1.34	10	0.781
<i>Chloris barbata</i> Sw.	7.25	2.90	4.31	40	3.125
<i>Chloris virgata</i> L.	4.29	3.00	4.46	70	5.469
<i>Cleome viscosa</i> L.	3.75	1.50	2.23	40	3.125
<i>Commelina benghalensis</i> L.	5.50	1.10	1.63	20	1.563
<i>Corchorus aestuans</i> L.	2.00	0.20	0.30	10	0.781
<i>Corchorus trilocularis</i> L.	3.00	0.30	0.45	10	0.781
<i>Croton bonplandianus</i> Baillon	4.13	3.30	4.90	80	6.250
<i>Cynodon dactylon</i> (L.) Pers.	4.25	1.70	2.53	40	3.125
<i>Cyperus rotundus</i> L.	10.00	1.00	1.49	10	0.781
<i>Datura metel</i> L.	2.00	0.20	0.30	10	0.781
<i>Enicostema axillare</i> (Lam.) A. Raynal	9.00	0.90	1.34	10	0.781
<i>Evolvulus alsinoides</i> (L.) L.	2.00	0.20	0.30	10	0.781
<i>Heliotropium supinum</i> L.	4.00	0.40	0.59	10	0.781

<i>Hyptis suaveolens</i> (L.) Poit.	6.75	2.70	4.01	40	3.125
<i>Indigofera tinctoria</i> L.	2.00	0.20	0.30	10	0.781
<i>Leucas aspera</i> (Willd.) Link.	3.25	1.30	1.93	40	3.125
<i>Oldenlandia umbellata</i> L.	2.00	0.20	0.30	10	0.781
<i>Parthenium hysterophorus</i> L.	11.00	1.10	1.63	10	0.781
<i>Plumbago zeylanica</i> L.	2.00	0.20	0.30	10	0.781
<i>Polycarpha corymbosa</i> (L.) Lam.	6.00	1.20	1.78	20	1.563
<i>Sphaeranthus indicus</i> L.	2.00	0.20	0.30	10	0.781
<i>Tephrosia purpurea</i> (L.) Pers.	4.00	0.40	0.59	10	0.781
<i>Tribulus terrestris</i> L.	5.25	2.10	3.12	40	3.125
<i>Tridax procumbens</i> L.	4.25	1.70	2.53	40	3.125
<i>Xanthium indicum</i> Koen.	2.00	0.20	0.30	10	0.781

Table 4: Structural diversity aspects of climber species in sacred grove of Thatthanur village, Ariyalur district.

Species Name	AB	DE	RD	FQ	RF
<i>Abrus precatorius</i> L.	2.00	0.40	3.36	20	5.000
<i>Acacia caesia</i> (L.) Willd.	1.00	0.30	2.52	30	7.500
<i>Aristolochia indica</i> L.	2.00	0.20	1.68	10	2.500
<i>Cansjera rheedii</i> J.F. Gmel.	2.00	0.20	1.68	10	2.500
<i>Capparis zeylanica</i> L.	2.50	0.50	4.20	20	5.000
<i>Cardiospermum halicacabum</i> L.	3.75	1.50	12.61	40	10.000
<i>Ceropegia juncea</i> Roxb.	2.00	0.20	1.68	10	2.500
<i>Cissus quadrangularis</i> L.	9.00	0.90	7.56	10	2.500
<i>Citrullus colocynthis</i> (L.) Schrad.	2.00	0.20	1.68	10	2.500
<i>Clitoria ternatea</i> L.	3.00	1.20	10.08	40	10.000
<i>Coccinia grandis</i> (L.) J. Voigt.	3.00	0.90	7.56	30	7.500
<i>Cocculus hirsutus</i> (L.) Diels	7.00	0.70	5.88	10	2.500
<i>Cuscuta reflexa</i> Roxb.	2.00	0.20	1.68	10	2.500
<i>Hemidesmus indicus</i> (L.)R.Br.	2.50	1.00	8.40	40	10.000
<i>Ipomoea cairica</i> (L.)Sweet.	2.00	0.20	1.68	10	2.500
<i>Mukia maderaspatana</i> (L.) Roemer	3.67	1.10	9.24	30	7.500
<i>Passiflora foetida</i> L.	4.00	0.40	3.36	10	2.500
<i>Pergularia daemia</i> (Forssk.) Chiov.	2.00	0.20	1.68	10	2.500
<i>Solanum trilobatum</i> L.	3.00	0.30	2.52	10	2.500
<i>Solena amplexiculis</i> Lam.	1.00	0.10	0.84	10	2.500
<i>Tinospora cordifolia</i> (Willd.) Hook.	5.00	1.00	8.40	20	5.000
<i>Ziziphus oenoplia</i> (L.) Mill.	2.00	0.20	1.68	10	2.500

Diversity Indices Analysis

The tree population comprises the number of species (27) with genera (21) and families (17). The diversity indices showed the Shannon-Weiner index value (3.08), evenness index (0.75), species richness index (43.6), Simpson index (0.93), and the dominance concentration of the tree species (0.060). The dominance concentration (Cd) was highest compare to the sacred grove in Konjikuppam village of Cuddalore district (Nithyadevi and Sivakumar 2015) ^[17]. Among the shrub populations number of species (23), Shannon-Wiener index (H') was (2.83) higher than Konjikuppam sacred grove (Nithyadevi and Sivakumar, 2015) ^[17]. Species richness index (5.542) tree species of the present study. The other diversity indices showed the Simpson index (0.091), the evenness index (1.22) and concentration dominance (0.112). In the present study, shrubs (23) with genera (21) and families (13). Population diversity indices showed Shannon Weiner index (2.832), Simpson index (0.9237), evenness index (0.738), species richness index (4.499), and the species dominance concentration (0.076). 2 are higher than a sample -1 which showed very least vegetation. The herb population comprises the number of species (49), with genera (43) and families (24). Population diversity indices showed the Shannon Weiner index (3.461), Simpson index (0.9604), evenness index (0.738), species richness index (7.371) and the species dominance concentration (0.6497). 22 climber species with 24 genera and 15 families present in the study sites, diversity indices showed Shannon-Weiner index (2.822), Simpson index (0.9287), evenness index (0.7644), species richness index (4.394) and the species dominance concentration (0.6497). Visalakshi (1995) ^[27] the value of the concentration of dominance for tropical forests of India varies from 0.21 to 0.92. A similar type of results was observed in the present study. High diversity and low Simpson index of dominance in different sides due to variation in anthropogenic pressure. Less species diversity (Shannon-Wiener index (H') in southside which was less protected, maybe due to decreased resource availability (Sagar *et al.*, 2003) ^[23]. The poor species diversity is due to indiscriminate logging in these areas and poor site conditions. The findings of local interviews on sacred grove biodiversity indicated that very few people having awareness of biodiversity. Similar types of observations were reported by Kellert (1991) ^[8] among Japanese people. A society which is having

environmental awareness is called an ideal society (Saheb *et al.*, 2012) [24]. This survey suggests that general awareness and perception about sacred grove biodiversity is useful for the successful implementation of a conservation strategy to improve biodiversity in the study area by involving local inhabitants.

Conclusion

The present study was done in a sacred grove situated in Thathanur village of Ariyalur district. A total of 121 plant species were recorded under 104 genera and 50 families. The family Fabaceae comprises 8 species followed by Asclepiadaceae, Mimosaceae (8 Species), Amaranthaceae, Asteraceae, and Malvaceae (6 species each), and the other families contributed (1 to 5 species each). The total basal area 4.446 m² (109 indiv.). *Ailanthus excelsa* (1.22 m²) is the highest contributor followed by *Tamarindus indica* (0.63m²) and *Alangium salvifolium* (0.531m²), *Albizia amara* showed the highest frequency in the study area. In the present study area conservation status except making a broad path around the temple and sacred grove is good by restricting to cut trees or woods for fuel and furniture and also the unknown new people are restricted to enter the grove without permission of the local community people. Further study is needed to quantify the data and suggests plans for the conservation of the area.

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