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Research Article

DIVERSITY AND DISTRIBUTION OF TREE SPECIES IN STATE HIGHWAY NINETY OF MARTHANDAM, KANYAKUMARI DISTRICT, TAMIL NADU.

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ABSTRACT

A preliminary survey on diversity and distribution of tree species was carried out in state highway of Marthandam, Kanyakumari district of Tamil Nadu. A total of 86 tree species representing 69 genera and 37 families were recorded in the study area. *Fabaceae* is the dominant family in the study area representing 16 species followed by *Moraceae* (7 species), *Rutaceae* and *Arecaceae* (6 species). *Annona* dominated with four species in genus level followed by *Artocarpus* (3 species), *Cassia* (3 species), *Citrus* (3 species) and *Ficus* (3 species). The present study represent that the study area have more species diversity with large number of species. Project road starts from Marthandam and traverses a length of 45.00 km, ends near intersection with SH 90. It passes through 18 villages and 40 minor and major habitat areas enroute. These trees are serving as mini ecosystem and provide shelter for variety of birds, insects and animals. Our forefathers thought it will be nice to have shade giving trees by the roadside; they planted hundreds of trees. The results revealed that the study area have more diversity of tree species within few kilometers. It shows the richness of biodiversity in Kanyakumari district of Tamil Nadu.

Keywords :- Tree diversity, Marthadam - Petchiparai, Fabaceae.



INTRODUCTION

Biodiversity is one measure of the health of biological systems. Life on earth today consists of many millions of distinct biological species. Biodiversity is not consistent across the earth. It is consistently rich in the tropics and it is less rich in polar regions where conditions support much less biomass. A complex relationship exists among the different diversity levels. Identifying one level of diversity in a group of organisms does not necessarily indicate its relationship with other types of diversities [1]. Rapid environmental changes typically cause extinctions [2].

The studies of biodiversity have now assumed greater significance as ecologists try seriously to document global biodiversity in the face of unprecedented perturbation, habitat loss and extinction rates [3]. Floristic inventory and diversity status help us understand the species composition and diversity status of forests [4]. A flora is an inventory of the plants of a defined biogeographically region. The floristic studies are considered as the backbone of the assessment of phytodiversity, conservation management and sustainable utilization of bioresources of a region. They are helpful in providing clues of changing floristic pattern, new invasions, current status, rare, endemic and threatened (RET) taxa in a phytogeographical area.

Economic, social and environmental change is inherent to development. Whilst development aims to bring about positive change it can lead to conflicts. Roads

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are also associated with economic growth and national wealth, but they have various direct and indirect effects on their adjacent environment. They have vast ethnobotanical knowledge and they utilize the precious plant wealth sustainably.

Roadside vegetation fulfils many functions [5] including: control of erosion, ensuring aesthetic benefits, protection against snow being blown-in, reducing glare, strengthening the road grade line, creating a noise reducing barrier, decreasing the power of the wind and providing a habitat for animals. Many researchers approach the topic of roadside vegetation mainly from the perspective of landscape [6] ecology [7] and road user safety [8]. According to Forman [7], vegetation coverage is a key factor influencing erosion caused by rainfall. Rows of trees or bushes, both planted as well as occurring naturally, depending on the location or the design, also influence the flow of wind. They act as wind barrier and protect passing vehicles and cyclists [2]. Roadside vegetation also serves as and welling place for animals and birds [9]. Another relevant advantage of introducing greenery along roads and streets is the mitigation of the effects of microclimate, including oscillation of air temperature, isolation and winds. In summer, the temperature of the area under a tree crown may drop by even 10 degrees in comparison to areas without trees [10]. Road side trees, because of their proximity to generation of vehicle emissions, are important in reducing pollution [11].

Marthandam is a major trade centre in Kuzhithurai municipality across National Highway (SH 90) in the kanyakumari district of Tamil Nadu, India. Marthandam is famous for honey, cashew nut processing, rubber and hand-embroidered motifs. The area is full of greenery, and there is a river adjoining. It is also a major trade center due to its location bordering Kerala. It is one of the most fertile lands of Tamil Nadu and has the climatic conditions of Kerala. Pechiparai reservoir is a reservoir located 43 kilometers (27 miles) from the town of Nagarcoil, near the village of pechiparai in Kanyakumari District, Tamil Nadu, India.

Project road starts Marthadam - Pechiparai and Pechiparai - Azhagiamandapam traverses a length of 45.00 km, ends near intersection with SH 90 in Marthandam. It passes through the 18 villages and 40 minor and major habitat areas enroute. The present study aimed to study the diversity and distribution of tree species in state highway 90 of Marthandam in Kanyakumari district of Tamil Nadu.

MATERIALS AND METHODS Study area

The study area Marthadam - Pechiparai and Pechiparai - Azhagiamandapam covered some 45 Km and was located in the Kanyakumari district (8.3075°N and 77.2218°E) in southern Tamil Nadu of India. The tree species collected area has a cool temperate climate, rainfall of this area ranges between 1500 mm to 2600 mm with an average relative humidity of about 75 %. Maximum temperature rises up to 38.5° C in the summer season while in the winter minimum temperature fall up to 7°C. Rubber is dominated as native vegetation in agricultural lands.

Collection of Data

During the course of present study, field trips were carried out to the study area during June 2018 from Marthandam to Petchiparai and Pechiparai to Azhagiamandapam. Standard methodology was used to elicit the knowledge of road side trees. The collected plant specimens were processed at the laboratory of Botany, St. Xavier's College, Palayamkottai and identified with the help of available literature. The plants were identified from fresh specimens with the help of different floras [12]. Tree species were collected by hand and was identified by experts of the field.

RESULTS AND DISCUSSION

The total tree species from Marthadam-Pechiparai and Pechiparai-Azhagiamandapam is given in Table 1. The total of 86 tree species representing 69 genera and 37 families. *Fabaceae* comprises of 16 species followed by *Moraceae* (7 species), *Rutaceae* and *Arecaceae* (6 species), *Annonaceae* (5 species), *Myrtaceae* (4 species) and *Meliaceae* (3 species). Other families constitute one or more species in the study area (Table No. 1). At the genus level, *Annona* is dominated with four species followed by *Artocarpus* (3 species), *Cassia* (3 species), *Citrus* (3 species) and *Ficus* (3 species).

In the present study researcher drove about 45 Km from Marthadam to Pechiparai and Pechiparai to Azhagiamandapam and recorded 1342 road side trees. The roadside trees are continuous throughout the corridor except some stretches where open land agricultural land are observed. Rubber is dominant in open land. Of these 1342 trees, 1261 dicots and 66 monocot and 15 Gymnosperms. There are many large trees (more than 1000 - above girth size 60 cm) and less small trees in the study area. There are greater number of native trees is present. The total number of plants recorded from roadside listed in the Table. 1: figure 1, 2 and 23.

In the present survey, at the family level, dicot is dominated with 32 families followed by monocot (3 families) and Gymnosperms (2 families). In economic utilities, timber (24) yielding plants are dominated than the other utilities like edible and medicinal purposes (Figure 4). Many trees are used both for timber and edible purpose. In total 10 roadside trees is usually dominated by herbaceous vegetation. Plants on this strip tend to grow rapidly with simple light and with moisture from road drainage. Roadsides contain few regionally rare species but have relatively high plant species richness [13]. Numerous seeds are carried and deposited along roads by vehicles [14, 15]. Plants may also spread along roads due to vehicle-caused air turbulence [16, 17] or favorable roadside conditions. About 1342 trees are growing in Marthadam - Pechiparai and Pechiparai -Azhagimandapam road. *Terminalia cattapa* is the most dominant tree in road sides which is growing for shade. Pachiparai road contains the number of trees like Syzygium cumini, Azadirachta indica, Artocarpus hirsutus, and Tamariandus indica. Araucaria heterophylla, Butea monosperma and Caesalpinia pulcherima used as ornamental. Tectona grandis represents, it is one of the most dominant tree species in Thiruvatter state high way. Expansion of highway and land use change in proximity to road side areas has led to the alteration of structure and composition of vegetation.

S. No	Botanical Name	Family	Vernacular name	Uses	No of Species
1.	Acacia mangium Willd.	Fabaceae		Timber	13
2.	Adenanthera pavonina L.	Mimosaceae	Kundumani	Timber	3
3.	Aegle marmelos (L.) Corr.	Rutaceae	Vilvam	Medicinal	12
4.	Ailanthes triphysa (Desst.) Alston.	Simaroubaceae	Mattipal	Medicinal	11
5.	Ailanthus excelsa Roxb.	Simaroubaceae	Perumaram	Timber	6
6.	Albizia lebbeck (L.) Benth.	Fabaceae	Vagai	Timber & Medicinal	27
7.	Albizia saman F.Muell	Fabaceae	Amaivagai	Timber, Medicine and Gum	4
8.	Anacardium occidentale L.	Anacardiaceae	Kollampalam	Edible & Timber	6
9.	Annona cherimoya Mill.	Annonaceae	Kattu seetha	Edible & Medicinal	7
10.	Annona muricata L.	Annonaceae	Mullu munuthri	Edible & Medicinal	16
11.	Annona reticulata L.	Annonaceae	Ramar seetha	Edible & Medicinal	4
12.	Annona squamosa L.	Annonaceae	Seetha	Edible & Medicinal	9
13.	<i>Araucaria heterophylla</i> (Salisb.) Franco	Araucariaceae	Christmas maram	Ornamental	3
14.	Areca catechu L.	Arecaceae	Pakku	Edible	18
15.	Artocarpus alitilis Var.	Moraceae	Anjili	Edible/Medicinal	3
16.	Artocarpus heterophyllus Lam.	Moraceae	Palla	Edible & Timber	13
17.	Artocarpus hirsutus Lam.	Moraceae	Aini	Edible & Timber	28
18.	Averrhoba bilimbi L.	Oxalidaceae	Pulima	Edible & Medicinal	2
19.	Averrhoba carambola L.	Oxalidaceae	Tamaratti	Edible	1
20.	Azadirachta indica A. Juss.	Meliaceae	Vempu	Medicinal	27
21.	Borassus flabellifer L.	Arecaceae	Panai	Timber & Medicinal	4
22.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Palasham	Ornamental	4
23.	Caesalpinia pulcherima (L.) Sw.	Fabaceae	Mayurkonarai	Ornamental	5
24.	Callistemon lanceolatus (Sm.) Sweet	Myrtaceae	Bottle brush	Medicinal	5
25.	Calophyllum inophyllum L.	Callophyllaceae	Punnai	Timber	11
26.	Carica papaya L.	Caricaceae	Рарауа	Edible & Medicinal	17
27.	Caryota urens L.	Arecaceae	Koonthal Panai	Ornamental	6
28.	Cassia biflora L.	Fabaceae		Ornamental	18
29.	Cassia fistula L.	Fabaceae	Sarakkontrai	Ornamental	7
30.	Cassia siamea L.	Fabaceae	Manjal kondrai	Timber & Ornamental	3
31.	Casuarina equisetifola L.	Fabaceae	Savukku	Timber	18
32.	Ceiba pentandra (L.) Gaertn.	Bombaceae	Elavampanchu	Timber & Fiber	8
33.	Cinnamomum verum J.S Perst. Rostl	Lauraceae	Lavangam	Medicinal	6
34.	Citrus bergamia Risso	Rutaceae	Naarthangai	Edible	4

Table No: 1	1. List of	Tree species	diversity	in Southeast	region of	Marthandam

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25		D. I			
35.	Citrus limon (L.) Osbeck	Rutaceae	Elumicchai	Medicine/Edible	7
36.	Citrus maxima Merr.	Rutaceae	Pampalimasu	Edible	3
37.	Cocos nucifera L.	Arecaceae	Thennai	Timber & Medicinal	14
38.	Cupressus sempervirens L.	Cupressaceae	Churam	Ornamental	6
39.	Cycas circinalis L.	Cycadaceae		Medicinal	3
40.	Cycas revoluta Thunb	Cycadaceae		Ornamental	3
41.	<i>Delonix regia</i> (Boj. ex Hook.) Raf.	Fabaceae	Mayil kondrai	Medicinal	20
42.	Diospyrous blancoi Willd	Ebenaceae	Velvet apple	Edible	1
43.	<i>Dypsis lutescens</i> (H. Wendl.) Beentji &J.Dranst	Arecaceae		Ornamental	7
44.	Eucalyptus globus L.	Myrtaceae	Thailamaram	Oil	6
45.	Ficus benghalensis L.	Moraceae	Alamaram	Timber	22
46.	Ficus racemosa L.	Moraceae	Aathipalam	Edible	1
47.	Ficus religiosa L.	Moraceae	Aarasamaram	Timber & Medicinal	9
48.	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Waln	Fabaceae	Seemai Agathi	Shade	17
49.	Hevea brasiliensis Mull. Arg.	Euphorbiaceae	Rubber	Timber	42
50.	Leucaena leucocephala (Lam.) de Wit.	Fabaceae	Periya-takarai	Shade	18
51.	Limnonia acidissima L.	Rutaceae	Vilampalam	Medicinal & Edible	6
52.	Madhuca longifolia (Koen.) Machr.	Sapotaceae	Ilupai	Timber & Medicinal	3
53.	Malpighia glabra L	Malpighiaceae	Barbados cherry	Medicinal	1
54.	Mangifera indica L.	Anacardiaceae	Maa	Timber & Edible	46
55.	Manilkara zapota (L) P. Roven	Sapotaceae	Sappota	Edible	15
56	Melia azedarach L	Meliaceae	Malai vempu	Timber/Medicine	8
57.	Michelia champaca L	Magnoliaceae		Timber	2
58	Millingtonia hortensis L f	Bignoniaceae	Katmalli	Shade	4
50.	Morindia tinctoria L	Rubiaceae	Manjanathi	Timber & Medicinal	28
60	Moringa oleifera Lam	Moringaceae	Murungai	Edible	28
61	Morus nigra I	Moraceae	Mulberry	Edible	18
62	Muntingia calabura I	Flaeocarpaceae	Then nazhlam	Timber & Edible	24
63	Muningia calabara L. Murraya koenji I	Rutaceae	Karruyapillai	Food & Medicinal	24
64	Murraya Koenji L. Musa paradisiaca I	Musacaaa	Vazhai	Edible & Medicinal	31
65.	Peltophorum pterocarpum	Ceasalpiniaceae	Manjal konrai	Timber	8
	(DC.) Backer ex Heyne.	D111	D-1'	E 1911.	10
00.	Phyllanthus actaus (L.) Skeets.	Phyllanthaceae	Pulipu nelli	Edible & Medicinal	10
07.	Phylianthus emblica L.	Phylianthaceae			9
08.	Pisaium guajava L.	Myrtaceae	Koyya		35
69. 70	Plumeria alba L.	Apocynaceae	Perungali	Ornamental	3
/0.	Plumeria rubra L	Apocyanaceae		Medicinal	/
/1.	Polyaitnia longifolia Soon.	Annonaceae	Nettulingam	Timber	3
72.	Pongamia pinnata (L.) Pier.	Fabaceae	Pungu	Timber	20
73.	Punica granatum L.	Lythraceae	Maadhulai	Edible/Medicinal	4
74.	Revenala madagascariensis Sonn.	Musaceae	Kallvalai	Ornamental	1
75.	Roystonea regia (Kunth) O.F. Cook	Arecaceae	Royal palm	Ornamental	8
76.	Santalum album L	Santalaceae	Chandanam	Medicinal & Timber	9
77.	Saraca asoca (Roxb.) Wilde	Fabaceae	Asoga maram	Medicine	2
78.	Senna auriculata (L.) Roxb.	Fabaceae	Aavaram poo	Medicinal	16
79.	Swietenia mahogany (L.)Jacq	Meliaceae	Mahogany	Timber & Medicinal	8
80.	Syzygium cumini (L.) Skeels.	Myrtaceae	Naval	Timber & Edible	76

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81.	Tamarindus indica L.	Fabaceae	Puli	Timber & Edible	23
82.	Tectona grandis L.F.	Verbenaceae	Thekku	Timber	72
83.	Terminalia catappa L.	Combretaceae	Natu badham	Timber & Medicinal	229
84.	<i>Thesepesia populnea</i> (L.) Soland ex Correa.	Malvaceae	Poovarasu	Timber	38
85.	Vitex negundo L.	Verbanaceae	Karunochi	Medicinal	5
86.	Ziziphus jujuba Mill.	Rhamnasceae	Elandhai	Edible	8

Figure 1. Photographs of Selected Tree species from the study area



Lawsonia inermis Linn.

Artocarpus altilis Fosberg.

Gliricida sepium (Jacq.) Kunth ex Walp.





Delonix regia (Boj. ex Hook.) Raf.



CONCLUSION

In the present study tree species distribution and diversity analysis was carried out in Marthandam region of Tamil Nadu. The study concluded that the study area has more species diversity with large number of species. The diversity richness of indigenous forest shows considerable variation in occurrence of species between different altitudes. Most of the species in the study area have medicinal value and socio-economic importance. Therefore, there is a need for necessary action towards sustainability of forest and conservation of species at large. The most important conservation measure is environment education, explaining the importance of forest ecosystem. The implementation of the conservation activities leads to a natural regeneration, climate change mitigation and to protect the biodiversity for future generations.

In conclusion, roadside vegetation is rich in plant species, although apparently not an important conduit for plants. The scattered literature suggests a promising research frontier.

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