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ORIGINAL ARTICLE

**FLORISTIC INVENTORY ON NAGAMANGALAM AYYANAAR SACRED GROVE AT
ARIYALUR DISTRICT, TAMIL NADU**

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ABSTRACT

In the present study, floristic inventory on Nagamanagalam Ayyanaar Sacred groves were conducted and the results were reported here for the first time. The results revealed the presence of In the present study, the floristic inventory of Nagamangalam Ayyanaar Sacred Grove comprises totally of about 77 plant species belonged to 50 families and 73 genera were recorded. Rutaceae is the dominant family with *Ficus* and *Justicia* were the dominant the genera. Thus the present study indicated as the basic evidence of flora to support the view that the sacred groves are the repository and home to several threatened flora which needs for urgent conservation.

Keywords: Plant Composition, conservation, sacred grove, Tamil Nadu

1. INTRODUCTION

Nature worship has been a key force in shaping the human attitudes towards conservation and sustainable utilization of natural resources. Such traditional practices have been invariably operating in different parts of India (Anthwal *et al.*, 2006). Sacred groves are the tracts of virgin forests that were left untouched by the local inhabitants, harbour rich biodiversity, and are protected by the local people due to their cultural and religious beliefs and taboos that the deities reside in them (Gadgil and Vartak, 1975; Khiewtam and Ramakrishnan, 1989; Ramakrishnan, 1996; Chandrashekara and Sankar 1998, Kanowski *et al.* 1999). Sacred groves are the traditional natural museum with live specimens conserved by the local community through religious practice (Karthikeyan and Tangavelou, 2011). It is believed that these sacred virgin forests date back to thousands of years when human society was in the primitive state. Gadgil and Vartak (1975) have traced the historical link of the sacred groves to the pre- agricultural, hunting and gathering stage of societies. These virgin forests are believed to be pre-Vedic in origin and the area of sacred groves ranges from few square meters to several hectares. Sacred groves serve as a home for several birds and mammals and indirectly have symbiotic relationship with other animal species conservation (Islam *et al.* 1998). Sacred groves are the

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repositories of rare and endemic species and can be regarded as the remnant of the primary forest left untouched by the local inhabitants and protected then due to the belief that the deities reside in these forests. Many people have described sacred groves in different ways. However, there is an evident fact that wherever sacred groves existed, indigenous traditional societies have spiritual relationships with the existing physical environment sustained them. The role of sacred groves in the conservation of biodiversity has long been recognized (Kosambi, 1962; Gadgil and Vartak, 1976; Haridasan and Rao, 1985; Khan *et al.* 1997; 2008). In India, several reports have been discussed on the floristic wealth of sacred groves from several states including Tamil Nadu. In this paper, the floristic wealth of Nagamangalam Ayyanaar Sacred Grove from Ariyalur district of Tamil Nadu state was reported here first time in order to prepare the conservation and management plan for the biodiversity protection in India.

2. MATERIALS AND METHODS

Study Area

The study area Nagamangalam Ayyanaar sacred grove covers an area of about 4.5 hectares and located nearly 17 km away from Sendurai Town of Ariyalur district, Tamil Nadu. Temperature is moderately high and the average temperature during summer is 34°C and fewer less in winter. The average humidity ranged from 31 to 33% during November to December. Annual rainfall is ranging from 850 to 1000 mm. However, during the two decades the district has experienced rainfall only below normal. Most of the

rains occur during north east monsoon. Soil is a ferruginous type with admixture of limestone. The soil is shallow in rocky areas and deeper in valley with little or no humus. The vegetation of Nagamangalam Ayyanaar Sacred Grove is tropical dry evergreen forest type (Champion and Seth, 1968).

Methods

Intensive field surveys were made during the year 2015-2016 to explore the floristic composition and the conservation status of the Nagamangalam Ayyanaar Sacred Grove of Ariyalur district in Tamil Nadu. All the plant specimens available in the study areas were collected for authenticity and the herbarium specimens are prepared by following the methodology of Jain and Rao (1976). Photographs were also taken. The herbarium specimens were identified with the help of the Flora of the Presidency of Madras (Gamble and Fischer, 1915 - 1936), The Flora of British India (Hooker, 1872 - 1897) and The Flora of Tamil Nadu Camatic (Matthew, 1982). The Flora of Tamil Nadu by Henry et al. (1987 and 1989) and Nair and Henry (1983) has been referred for the correct botanical names for the specimens identified. The herbarium specimens were prepared for all the plants and deposited at PG & Research Department of Botany, M. R. Arts College, Mannaargudi, Tamil Nadu for reference.

3. RESULTS

In the present study, the floristic inventory of Nagamangalam Ayyanaar Sacred Grove comprises totally of about 77 plant taxa belonged to 50 families and 73 genera were recorded (Table 1). Among habitwise distribution, herbs were the dominant form represented by 38 % with 29 species followed by trees (27 % with 21 taxa), climbing herbs (15 % with 11 taxa), shrubs (11 % with 14 taxa) and liana (1 % with single taxa) respectively. Among the top 10 families, Rutaceae was recorded as the dominant family represented by 16 % with 5 taxa followed by Acanthaceae, Fabaceae and Lamiaceae by 13 % (4 taxa each), Boraginaceae, Moraceae and Rubiaceae by 9 % (3 taxa each) and Apocynaceae, Asclepiadaceae and Capparaceae by 6 % (2 taxa each) respectively. Among top 10 genericwise distribution, *Ficus* and *Justicia* were the dominant genera represented by 20 % with 3 taxa followed by *Indigofera* by 13 % with two taxa and others namely *Acacia*, *Aegle*, *Aerva*, *Alangium*, *Anisomeles*, *Asparagus* and *Atalantia* by 7 % with single taxa only.

4. DISCUSSION

Floristic study of vegetation is important to determine the distribution of food plants for wildlife (Ejtehadi et al., 2005) and prerequisite for much fundamental research in tropical community (Jayakumar et al., 2011). The floristic vegetation of the sacred groves is the representatives of the relic climax vegetation of the Indian subcontinent and part of the socio-cultural traditions (Gadgil and Vartak, 1976). The present findings are comparable with other studies reported in sacred groves of adjoining districts such as Pudukkottai, Thanjavur, Sivagangai in Tamil Nadu and other regions of India. In Tamil Nadu, several studies with respect to floristic inventory of sacred groves were reported includes 260

species in 176 genera and 62 families from Malliganatham (John Britto et al., 2001a), 224 species in 175 genera and 63 families from Vamban (John Britto et al., 2001b), 35 species in 32 genera and 22 families (Sridhar Reddy and Parthasarathy, 2006), 77 species in 61 genera and 30 families (Mani and Parthasarathy, 2006) from 4 sacred groves of Coromandel coast, 265 species from 50 sacred groves collectively (Karthikeyan and Tangavelou, 2011), 106 species belonging to 97 genera and 54 families from Manganampatti, Nadiamman and Suranviduthi village (Vinothkumar et al., 2011), 185 species from 156 genera and 69 families (Vadivelu et al., 2011a), 228 species from 197 genera and 85 families (Vadivelu et al., 2011b), 262 species from 221 genera and 89 families from 21 sacred groves collectively (Tangavelou et al., 2013) from Pudukkottai district while 101 species from 91 genera and 51 families (Gandhi et al. 2012a), 143 species from 129 genera and 58 families (Gandhi et al. 2012b) of Sivagangai district, and 65 species from 64 genera and 43 families (Jayapal et al., 2014a), 117 species from 102 genera and 51 families (Jayapal et al., 2014b), 180 species from 158 genera and 75 families (Jayapal et al., 2014a) from Thanjavur district, 98 species in 38 families and 76 genera from 33 sacred groves of Theni district (Manikandan et al., 2011), 98 species in 87 genera and 43 families from 11 miniature sacred groves. Sukumaran and Jeeva, (2008) of Kanniyakumari district, 133 plant species from sacred groves in Pallipatty village of Madurai district (Ganesan et al., 2007) of Tamil Nadu. In addition, Sambandan and Dhatchanamoorthy, (2012) reported 59 species in 55 genera and 30 families from Karaikal. Thus, floristic diversity assessment is significant at local and regional levels to understand the present status and to make effective management strategies for conservation (Jayakumar et al., 2011).

Moreover, the presence of various dry evergreen plant species such as *Albizia amara*, *Atalantia monophylla*, *Morinda pubescens*, *Stychnos nux-vomica* revealed that the vegetation of the selected sacred groves is a tropical dry evergreen forest type. This is due to the presence of typical, characteristic and preferential evergreen tree species Meher-Honji (1974). In the present study, the plant diversity is low when compared to other studies in various studies of sacred groves in Tamil Nadu. This may be due to the habitat destruction of sacred groves which leads to less diversity of plant species.

The threatened plants recorded from the study area include *Aegle marmelos*, *Curculigo orchioides*, *Gloriosa superba* and *Madhuca longifolia* respectively. *Gloriosa superba*, an endangered plant has been reported from several Sacred groves of India includes Ramlingshwarra Sacred Grove in Kamataka (Yelvattimath and Kotresha, 2011), 8 Sacred groves of Pallampatty village, Madurai district in Tamil Nadu (Ganesan et al., 2009). Moreover the tree species *Aegle marmelos* was reported to be present in most of the sacred groves (Smita and Pandey, 2012; Patel and Patel, 2012) and it has been considered as *Sthalaviriksha* (Sacred tree) in most of the temples to worship Lord Shiva in India (Nirmal Kumar et al., 2005; Sukumaran and Raj, 2008; Sharma and Joshi, 2010) for prosperity. Thus the present study indicated as the basic evidence to support the view that the sacred groves are the repository and home to several

Table 1. Floristic inventory recorded from Nagamangalam Ayyannar Sacred groves from Ariyalur district, Tamil Nadu

S.No.	Botanical Names	Family	Habit
1	<i>Acacia nilotica</i> (L.) Del. <i>Indica</i> (Benth) Brenan	Mimosaceae	Tree
2	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Herb
3	<i>Aerva lanata</i> (L.) A.L. Juss.	Amaranthaceae	Tree
4	<i>Alangium salvifolium</i> (L.f.) zWangerin.	Alangiaceae	Tree
5	<i>Anisomeles malabarica</i> (L.) Kuntz	Lamiaceae	Herb
6	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Climbing herb
7	<i>Atalantia monophylla</i> (L.) Corr.	Rutaceae	Tree
8	<i>Azadiracta indica</i> A.Juss.	Meliaceae	Tree
9	<i>Azima tetracantha</i> Lam.	Salvadoraceae	Tree
10	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb
11	<i>Cadapa fruticosa</i> (L.) Druce.	Capparaceae	Shrub
12	<i>Carissa carandas</i> L.	Apocynaceae	Shrub
13	<i>Carmona retusa</i> (Vahl) Masam.	Boraginaceae	Shrub
14	<i>Cassytha filiformis</i> L.	Lauraceae	Climbing herb
15	<i>Catunaregam spinosa</i> (Thub.) Tirvengadam	Rubiaceae	Shrub
16	<i>Cissampelos pariera</i> L. var. <i>hirsuta</i> (Buch.Ham. ex DC.) Forman.	Menispermaceae	Climbing herb
17	<i>Cissus quadrangularis</i> L.	Vitaceae	Climbing shrub
18	<i>Clausena dentata</i> (Willd.) Roemer	Rutaceae	Shrub
19	<i>Cleome viscosa</i> L.	Cleomaceae	Herb
20	<i>Cocculus hirsutus</i> (L.) Diels	Cucurbitaceae	Climbing herb
21	<i>Coldenia procumbens</i> L.	Boraginaceae	Herb
22	<i>Combretum albidum</i> G. Don.	Combretaceae	Climbing herb
23	<i>Commelina benghalensis</i> L.	Commelinaceae	Herb
24	<i>Crateva magna</i> (Lour.) DC.	Capparaceae	Tree
25	<i>Curculigo orchiooides</i> Gaertner	Hypoxidaceae	Herb
26	<i>Cuscutta reflexa</i> Roxb.	Convolvulaceae	Climbing herb
27	<i>Cymphostemma setosum</i> (Roxb.) Alston	Vitaceae	Climbing herb
28	<i>Cynodon dactylon</i> (L.) Pers	Poaceae	Herb
29	<i>Cyperus rotundus</i> L.	Cyperaceae	Herb
30	<i>Dendrophthoe falcata</i> (L.f.) Ettingsh	Loranthaceae	Tree
31	<i>Diospyros ebenum</i> J. Koel ex retz.	Ebenaceae	Tree
32	<i>Drypetes septaria</i> (Wight & Arn.) Pax & Hoffm.	Euphorbiaceae	Tree
33	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Herb
34	<i>Ficus benghalensis</i> L.	Moraceae	Tree
35	<i>Ficus racemosa</i> L.	Moraceae	Tree
36	<i>Ficus religiosa</i> L.	Moraceae	Tree
37	<i>Fimbristylis</i> sp.	Cyperaceae	Herb
38	<i>Flacourtia indica</i> (Burm.f) Merr.	Flacourtiaceae	Tree
39	<i>Gloriosa superba</i> L.	Liliaceae	Climbing herb
40	<i>Glycosmis pentaphylla</i> (Retz) DC.	Rutaceae	Shrub
41	<i>Gyrocarpus asiaticus</i> Willd.	Hernandiaceae	Tree
42	<i>Habenaria</i> sp.	Orchidaceae	Herb
43	<i>Hedyotis puberula</i> (G. Don) Arn.	Rubiaceae	Herb
44	<i>Heliotropium indicum</i> L.	Boraginaceae	Herb
45	<i>Hemidesmus indicus</i> (L.) R.Br. var. <i>indicus</i>	Periplocaceae	Climbing herb
46	<i>Hiptage benghalensis</i> (L.) Kurz	Malphiaceae	Shrub
47	<i>Holoptelea integrifolia</i> (Roxb) Planchon	Ulmaceae	Tree
48	<i>Hugonia mystax</i> L.	Linaceae	Liana
49	<i>Hybanthes enneaspermus</i> (L.) F. Muell.	Violaceae	Herb
50	<i>Hyptis suaveolens</i> (L.) Poit	Lamiaceae	Herb
51	<i>Ichnocarpus frutescens</i> (L.) R.Br.	Apocynaceae	Climbing shrub

52	<i>Indigofera aspalathoides</i> M. Vahl. ex DC.	Fabaceae	Herb
53	<i>Indigofera linnaei</i> Ali	Fabaceae	Herb
54	<i>Indonesiella echioides</i> (L.) Sreemadh.	Acanthaceae	Herb
55	<i>Jasminium angustifolium</i> (L.) Willd.	Oleaceae	Climbing herb
56	<i>Justicia glauca</i> Rottler	Acanthaceae	Herb
57	<i>Justicia simplex</i> D.Don.	Acanthaceae	Herb
58	<i>Justicia tranquebariensis</i> L.f.	Acanthaceae	Herb
59	<i>Leptadenia reticulata</i> (Retz.) Wight & Arn.	Asclepiadaceae	Climbing herb
60	<i>Leucas aspera</i> (Willd.) Link.	Lamiaceae	Herb
61	<i>Mollugo pentaphylla</i> L.	Molluginaceae	Herb
62	<i>Morinda pubescens</i> J.E.Smith var. <i>pubescens</i>	Rubiaceae	Tree
63	<i>Madhuca longifolia</i> (Koen.) Macbr.	Loganiaceae	Tree
64	<i>Olex scandens</i> Roxb.	Olacaceae	Tree
65	<i>Opuntia dilleni</i> (Ker.Gaw.) Haw.	Cactaceae	Shrub
66	<i>Orthosiphon thrysiflorus</i> (Roth) Slessen	Lamiaceae	Herb
67	<i>Pavonia odorata</i> Willd.	Malvaceae	Herb
68	<i>Pedaliium murex</i> L.	Pedaliaceae	Herb
69	<i>Percularia daemia</i> (Forssk.) Chiov.	Asclepiadaceae	Climbing herb
70	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Shrub
71	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Tree
72	<i>Secrunga leucopyrus</i> (Willd.)Muell.Arg.	Euphorbiaceae	Shrub
73	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Tree
74	<i>Toddalia asiatica</i> (L.) Lam.	Rutaceae	Climbing shrub
75	<i>Tribulus lanuginosus</i> L.	Zygophyllaceae	Herb
76	<i>Ziziphus mauritiana</i> Lam. var. <i>mauritiana</i>	Rhamnaceae	Shrub
77	<i>Zornia gibbosa</i> Span.	Fabaceae	Herb

threatened flora (Gadgil and Vartak, 1976; Unnikrishnan, 1995; Chandrasekhara and Sankar, 1998).

From the present study, it is concluded that the Awareness programmes on sacred grove protection and conservation are suggested to be implemented at local levels to conserve the biodiversity.

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