

# A Floristic Study on Select Sacred Groves of Parakudi village, Kanyakumari District, Tamilnadu, South India

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## Abstract

Sacred groves are significant places in which biodiversity is preserved in mostly undisturbed condition because of certain taboos and religious beliefs associated with them. Based on inventory and preliminary survey, two sacred groves were selected in Parakudi village along the southwest coast of Kanyakumari district for the purpose of detailed studies of floristic richness. Total of 124 species of angiosperms belonging 48 families, 10 species of pteridophytes and 1 species of gymnosperm were recorded. Of these 25 were trees, 28 shrubs, 56 herbs and 15 climbers. Five species remain unidentified including on orchid taxon. Family-wise distribution of plant families showed that Poaceae was the most speciose family with 10 species in site 1, whereas, Asteraceae, Fabaceae and Malvaceae were the dominant families in site 2 with 5 species each. Inventorying of the flora of sacred groves would provide a strong basis for evolving measures for their protection.

**Key words:** Floristic survey, Kanyakumari district, Parakudi village, sacred grove, vascular plants.

## Introduction

Sacred groves are ancient natural sanctuaries that have supported the sustenance of several interesting and rare species of flora and fauna (Kosambi, 1962). In India, the sacred groves are spread over the country and most of them remain unprotected today due to lack of federal legislation. The role of sacred groves in the conservation of biodiversity has long been recognized (Kosambi, 1962; Haridasan and Rao, 1985; Khan *et al.*, 1997; Anthwal *et al.*, 2006). All forms of vegetation in the sacred groves are supposed to be under the protection of the reigning deity of that grove, and the removal of even a small twig is taboo (Vartak and Gadgil, 1973). About 14,000 sacred groves have been reported in the country. Sacred groves are numerous along the Western Ghats in the states of Kerala and Karnataka (Deshmukh *et al.*, 1998). These groves vary in size from a few trees to dense forests covering vast tracts of land (Jonathan, 2008).

Many scholars have been working on conservation of sacred groves through socio-cultural practices in different parts of India (Gadgil and Vartak, 1975, 1976; Boojh and Ramakrishnan, 1983; Khiewtam and Ramakrishnan, 1989; Rodgers, 1994; Oliver *et al.*, 1997; Sinha and Maikhuri, 1998; Sunitha and Rao, 1999; Basu, 2000; Kushalapa *et al.*, 2001). However, not much information is available on sacred groves of Kanyakumari district. In view of this fact, the present study was conducted to investigate the floristic richness and highlight the botanical significance of the sacred groves of Parakudi village, which is situated on the foothills of southern Western Ghats.

## Materials and Methods

### Study Area

Based on the inventory and preliminary survey, two sacred groves (site I and II) were selected in Parakudi village (Plate 1). These forests lie in the boundary of Kerala and Tamilnadu, at Kunnatoor village and are managed by the village communities. The distance between the two groves is 100 m. Villagers revealed that in the olden days

both the groves were one; however anthropogenic disturbances, mainly construction of a road and agricultural activity, to its fragmentation.

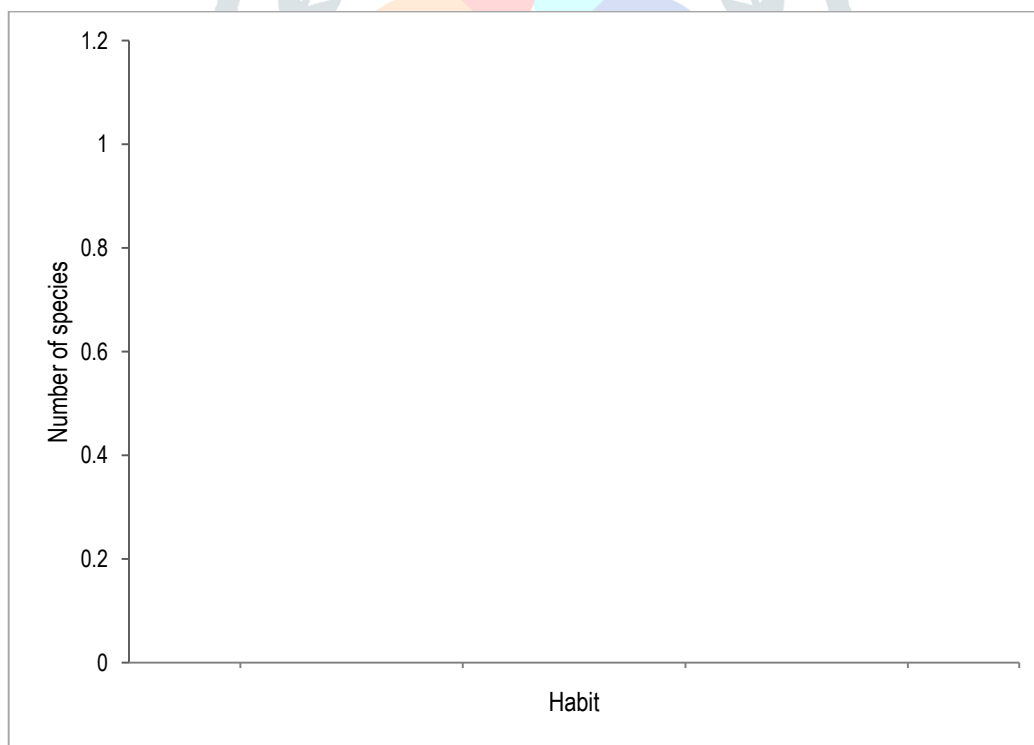
The total area of this grove is about 1 ha. Nearly 60% of this area has now been converted into an agro-ecosystem. Previously, this grove had been a 'Kaavu' where snakes were worshipped. At that period of time, there was not much destruction of the grove by the people because of their religious beliefs. Species loss may now happen due to the construction of the road. The area of this sacred forest has now been reduced to 1 acre, with openings in the canopy. The perennial fresh water present in this grove is consumed by the local people.

### ***Taxonomic Evaluation***

Plant species were collected and identified taxonomically with the help of regional and local floras (Gamble, 1915-1936; Matthew, 1999; Manickam *et al.*, 2008). The Herbaria of Botanical Survey of India, Southern Circle, Coimbatore; Kerala Forest Research Institute, Peechi; Tropical Botanical Garden and Research Institute (TBGRI), Palode, Trivandrum, Kerala and Department of Botany, N.M. Christian College, Marthandam were consulted for correct identification of plant specimens. The nomenclature of species follows the regional flora. Voucher specimens were deposited in the herbarium (NMCCH) of N.M. Christian College, Marthandam.

### **Results and Discussion**

Floristically a total of 124 taxa of angiosperms belonging to 48 families (Table 1), 10 species of pteridophytes and a species of gymnosperm were recorded. Of these, 25 were trees, 28 shrubs, 56 herbs and 15 climbers (Figure 1). Five species remain unidentified including a species of orchid. The invasion of exotic weeds such as *Lantana camara* and *Chromolaena odorata* in the periphery of the sacred groves depict that they are under various degrees of disturbance due to the decline in religious beliefs of the trustees of these groves.



**Figure 1. Habit - wise distribution of plant species in the study area**

Study of the family – wise distribution of plants in site I showed that Poaceae was the most speciose family with 10 species and Asteraceae with 9 species was the co-dominant family, followed by Acanthaceae and Fabaceae with 5 species each, and four families (Lamiaceae, Moraceae, Euphorbiaceae and Amaranthaceae) with 4 species each. Twenty – five families were monospecific. Asteraceae, Fabaceae and Malvaceae were the dominant

families in site II with 5 species each, Euphorbiaceae, Lamiaceae and Poaceae with four species each were the codominant families followed by Acanthaceae with 3 species. Sixteen families were represented by single species.

The pteridophytes recorded in the study area were *Acrostichum aureum*, *Adiantum latifolium*, *Christella parasitica*, *Hemionitis arifolia*, *Marislea minuta*, *Pityrogramma calomelanos*, *Lygodium flexuosum* and *Salvinia molesta*. Presence of an IUCN red-listed rare gymnospermic species *Cycas circinalis* implies the need for conservation of the groves. These plants are defoliated during the festivals for decoration purposes, causing serious threat to this species.

Some wild species related to cultivated species were reported in the sacred forests. They are *Ananas comosus*, *Artocarpus hirsutus*, *Artocarpus heterophyllus*, *Borassus flabellifer*, *Gloriosa superba*, *Hemidesmus indicus*, *Murraya koenigii*, *Tamarindus indicus* and *Zizyphus oenopia*. The medicinal plants ranked first, followed by edible, timber, non-timber forest produce, etc. *Artocarpus heterophyllus*, *A. hirsutus*, *Mangifera indica* and *Tamarindus indica* are economically valuable.

**Table 1. Plant species observed from the sacred groves**

S. No	Botanical Name	Family	Sacred Grove	
			Site I	Site II
<b>Trees</b>				
1	<i>Allianthus triphysa</i>	Simaroubaceae	+	-
2	<i>Acacia mangiam</i>	Fabaceae	+	-
3	<i>Artocarpus hirsutus</i>	Moraceae	+	-
4	<i>Azadirachta indica</i>	Meliaceae	+	-
5	<i>Borassus flabellifer</i>	Areceae	+	-
6	<i>Canthium dicoccum</i>	Rubiaceae	+	-
7	<i>Calophyllum inophyllum</i>	Guttiferae	+	-
8	<i>Cocus nucifera</i>	Arecaeae	+	+
9	<i>Dichrostachys cinera</i>	Nimosaceae	+	-
10	<i>Fiscus benghalensis</i>	Moraceae	+	-
11	<i>Lannea coromandelica</i>	Anacerdiaceae	+	-
12	<i>Leucaena leucocephala</i>	Mimosaceae	+	-
13	<i>Madhuca indica</i>	Sapotaceae	+	-
14	<i>Morinda tinctoria</i>	Rubiaceae	+	-
15	<i>Murrakya koenigii</i>	Rutaceae	+	-
16	<i>Musa paradisiacal</i>	Musuceae	+	-
17	<i>Olea dioca</i>	Oleaceae	+	-
18	<i>Pongamia pinnata</i>	Fabaceae	+	-
19	<i>Psidium guajava</i>	Myrtaceae	+	-
20	<i>Santalum album</i>	Santalaceae	+	-

S. No	Botanical Name	Family	Sacred Grove	
			Site I	Site II
21	<i>Schleicheria oleosa</i>	Sapindaceae	+	-
22	<i>Sizygium cumini</i>	Myrtaceae	+	-
23	<i>Tamrindus indica</i>	Caesalpiniaceae	+	-
24	<i>Tectona grandis</i>	Verbanaceae	-	+
25	<i>Terminalia catappa</i>	Combretaceae	+	-
<b>Shurbs</b>				
26	<i>Abutilon indicom</i>	Malvaceae	-	+
27	<i>Alstonia scholaris</i>	Apocyanaceae	+	-
28	<i>Annona squmosa</i>	Annoaceae	+	-
29	<i>Anisomeles malabarica</i>	Lamiaceae	+	+
30	<i>Barleria prionitis</i>	Acanthaceae	+	-
31	<i>Barleria mysorensis</i>	Acanthaceae	-	+
32	<i>Carmona retusa</i>	Boraginaceae	+	+
33	<i>Carissa carandas</i>	Apocyanaceae	-	+
34	<i>Carissa spinarum</i>	Apocyanaceae	-	+
35	<i>Canthium angustifolium</i>	Rubiaceae	+	-
36	<i>Crotalaria juncea</i>	Fabaceae	-	+
37	<i>Chlerodendrum inerme</i>	Vernanaceae	+	-
38	<i>Chlnomolena oderata</i>	Asteraceae	+	+
39	<i>Desmodium vaxillatum</i>	Papilionaceae	+	-
40	<i>Grewia bracteata</i>	Teliaceae	+	-
41	<i>Hibiscus rosa-sinensis</i>	Malvaceae	+	-
42	<i>Jatropha glandulifera</i>	Euphorbiaceae	-	+
43	<i>Knoxia heyneana</i>	Rubiaceae	-	+
44	<i>Lantana camara</i>	Verbanaceae	+	+
45	<i>Manihot esculenta</i>	Euphorbiaceae	-	+
46	<i>Naregamia alata</i>	Meliaceae	+	+
47	<i>Orthosiphon thymifloorum</i>	Lamiaceae	-	+
48	<i>Polygala javana</i>	Polygalaceae	-	+
49	<i>Phyllanthus emblica</i>	Euphorbiaceae	+	-
50	<i>Sida cordifola</i>	Malvaceae	-	+
51	<i>Streblus asper</i>	Moraceae	+	-
52	<i>Urena labata</i>	Malvaceae	-	+
53	<i>Ziziphus oenoplia</i>	Rhamaceae	+	-
<b>Herbs</b>				
54	<i>Achyranthus aspera</i>	Amaranthaceae	+	+
55	<i>Aerva lanata</i>	Amaranthaceae	+	+
56	<i>Ageratum coryzoides</i>	Asteraceae	+	-

S. No	Botanical Name	Family	Sacred Grove	
			Site I	Site II
57	<i>Alloteropsis cimicina</i>	Poaceae	+	-
58	<i>Alternanthera sessilis</i>	Amaranthaceae	+	-
59	<i>Andrographis paniculata</i>	Acanthaceae	+	+
60	<i>Apluda mutica</i>	Poaceae	+	+
61	<i>Aristida setacea</i>	Poaceae	-	-
62	<i>Asteracanta longifolia</i>	Acanthaceae	+	-
63	<i>Axonopus compressus</i>	Poaceae	+	-
64	<i>Biophytum sensitivum</i>	Oxalidaceae	+	-
65	<i>Centella asiatica</i>	Apiaceae	+	+
66	<i>Cleome rutidosperma</i>	Capparaceae	+	-
67	<i>Commelina benghalensis</i>	Commelinaceae	+	-
68	<i>Commelina erecta</i>	Commelinaceae	+	+
69	<i>Cymbapogon travancorensis</i>	Poaceae	+	+
70	<i>Cyperus corybusus</i>	Cyperaceae	+	-
71	<i>Cyrtococcum longipes</i>	Poaceae	-	+
72	<i>Dactyloctenium aegyptium</i>	Poaceae	+	-
73	<i>Eleusine indica</i>	Poaceae	+	-
74	<i>Elephantopus scaber</i>	Asteraceae	+	-
75	<i>Emillia sonchifolia</i>	Asteraceae	+	+
76	<i>Eragrostis gangetica</i>	Poaceae	+	-
77	<i>Euphorbia hirta</i>	Euphorbiaceae	+	+
78	<i>Evolvulus alsinoides</i>	Convolvulaceae	+	-
79	<i>Evolvulus nummularis</i>	Convolvulaceae	-	+
80	<i>Gymnema sylvestre</i>	Asclepiadaceae	-	+
81	<i>Hedyotis corymbosa</i>	Rubiaceae	+	-
82	<i>Helotropium indicum</i>	Boraginaceae	-	+
83	<i>Hibiscus brackenridgei</i>	Malvaceae	+	+
84	<i>Hybanthus enneaspermus</i>	Violaceae	-	+
85	<i>Hyptis suaveolens</i>	Lamiaceae	+	-
86	<i>Justicia simplex</i>	Acanthaceae	+	+
87	<i>Kyllinga squamulata</i>	Cyperaceae	+	-
88	<i>Leucas aspera</i>	Lamiaceae	+	+
89	<i>Maranta arundinacea</i>	Aeraceae	+	+
90	<i>Mimosa pudica</i>	Minosaceae	+	+
91	<i>Ocimum sanctum</i>	Lamiaceae	+	-
92	<i>Panicum antidotata</i>	Poaceae	+	-
93	<i>Phyllanthus niruri</i>	Euphorbiaceae	+	+
94	<i>Pseudarthritis viscida</i>	Fabaceae	+	+

S. No	Botanical Name	Family	Sacred Grove	
			Site I	Site II
95	<i>Sesbastiana chamalea</i>	Euphorbiaceae	-	+
96	<i>Scoparia dulcis</i>	Scrophulariaceae	+	-
97	<i>Sida acuta</i>	Malvaceae	+	+
98	<i>Sporobolus inclados</i>	Poaceae	+	-
99	<i>Stylosanthus fruticosa</i>	Fabaceae	+	+
100	<i>Tephrosia</i> sps	Papilionaceae	-	+
101	<i>Vernonia cineria</i>	Asteraceae	+	+
102	<i>Vicoa indica</i>	Asteraceae	-	+
103	<i>Weddelia trilobata</i>	Asteraceae	+	-
104	<i>Synedrella nodiflora</i>	Asteraceae	+	-
<b>Climbers</b>				
105	<i>Aristolochia indica</i>	Aristolochiaceae	+	-
106	<i>Blepharis maderaspatensis</i>	Acanthaceae	+	-
107	<i>Cardiospermum halicacabum</i>	Sapindaceae	-	+
108	<i>Centrosema pubescens</i>	Fabaceae	-	+
109	<i>Cissampelos pareira</i>	Menispermaceae	-	+
110	<i>Crotalaria retusa</i>	Fabaceae	-	+
111	<i>Ficus tinctoria</i>	Moraceae	+	-
112	<i>Glorisa superba</i>	Liliaceae	-	+
113	<i>Jasminium angustifolium</i>	Oleaceae	+	-
114	<i>Jasminium malabaricum</i>	Oleaceae	+	-
115	<i>Merremia tridellata</i>	Convolvulaceae	+	-
116	<i>Piper nigrum</i>	Piperaceae	+	-
117	<i>Tinospora cordifolia</i>	Menispermaceae	-	+
118	<i>Vanda tassellata</i>	Orchidaceae	+	+

Abbreviations: (- absent; + present)

Sorensen Similarity Index showed, that 33.71% (20 species) of the herbaceous species were common in both the groves. It may be due to the locality of the groves, i.e, the groves are situated within a distance of 100 m. An epiphytic orchidaceous species *Vanda tassellata* representing both the groves showed the similarity in distribution of species in the groves studied.

Dominance of phanerophytes (44-51 %) in the sacred groves implies that they are structurally similar to tropical forests of Mexico (Vazquezg *et al.* 1998) and Costa Rica (Lieberman *et al.* 1996). Predominance of lianas and climbers, another important feature of tropical forests (Daniels *et al.* 1995; Vazquezg *et al.* 1998), was also observed in the sacred forests. High percentage of epiphytes (11-16 %) in the sacred groves is attributed to the year-round precipitation and high relative humidity (Sugden and Robins 1979; Benzing 1983). These findings of Upadhaya *et al.* (2003) in the sacred groves of Jaintia Hills in Meghalaya, northeast India. Sunitha (2002) studied 14 sacred groves in Kurnool district of Andhra Pradesh and recorded a maximum of 83 tree species in the 50-ha Upper Ahobilam sacred grove.

## Conclusion

The present study has documented the maintenance of sacred forests by the agricultural/urban societies. It further confirms that these forest have managed to survive up to the modern times but are struggling for survival now. The biodiversity of these groves is significantly rich, varied and valuable. Unless urgent measures are under taken, these “mini biosphere reserves” will be turned into “relicts of dying wisdom”.

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