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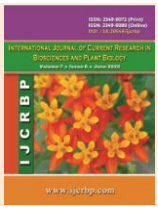

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Sacred groves of Point Calimere Wildlife and Bird Sanctuary – Ideal centres for biodiversity conservation

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ABSTRACT

Survey at Point Calimere Wildlife and Bird Sanctuary revealed six groves were located in the area of study. There is diversity in deities worshipped. The selected groves show the existence of many species of medicinal plants. In those six groves, 210 species of flowering plants were found. *Salvadora persica* is classified as 'Least Concern' in the IUCN Red List of Threatened Species 2019. *Drosera indica* and *Drosera burmanni* are carnivorous plants used extensively in herbal medicine and are classified as 'Least Concern' in the IUCN Red List of Threatened Species 2013. *Commiphora berryi* is a peninsular endemic species recorded in the present study. This wetland sacred forest area is of high biodiversity, with many unique species of animals and birds. The loss of faith, extraction of timber, shifting of deity/restricting the abode of the deity, clearing of groves for development activities, Biomass removal, Poaching and migration and occupation of lands by people of other faiths are the existing threats and major reasons for the decline of sacred groves.

Introduction

Many traditional conservation practices of indigenous people in many parts of the world such as protection of small forest patches by dedicating them to the local deity, also contributed to the conservation and protection of biodiversity. Such forest patches called 'Sacred groves' are tracts of virgin forest harbouring rich biodiversity, protected by the local people based on their indigenous cultural and religious beliefs and taboos. Indigenous knowledge systems or traditional practices of different communities are as valuable as they are the source of solution to many present-day problems. Sacred groves (SGs) in India refer to tracts of usually virgin forests of varying sizes which are communally protected having a significant religious connotation for protecting the community (Khan *et al.*, 2008). Biologically, they are rich patches of undisturbed forests and serve as a natural habitat for many endemic, rare, primitive and economically valuable plants along with a good number of wild animals, birds, reptiles, amphibians, variety of butterflies and insects (Samati and Gogoi, 2007). In India, about 13,720 sacred groves have been enumerated from different states (Malhotra *et al.* 2001). There are about 235 Sacred Groves recorded from

Eastern Ghats districts of Tamil Nadu (Swain *et al.* 2008). The present study was on the sacred groves of the Point Calimere Wildlife and Bird Sanctuary, Tamil Nadu, India.

The following are the specific objectives of the study.

- To conduct a survey of the sacred groves in Point Calimere Wildlife and Bird Sanctuary.
- To list the external influences leading to the degradation of sacred groves.

Materials and methods

Preliminary survey for collecting data on various aspects about the sacred grove was attempted. Survey of flora was made in selected groves by total inventory method. The source of materials for this floristic research was the extensive field collections of specimens made from the area of study during the period from Apr. 2010 to June. 2011. During the course of this study 14 field trips were undertaken. Standard methodology was used to elicit the knowledge of sacred grove plants. All the relevant information of each sacred grove plants was recorded. The plants specimens collected were processed at the Survey of Medicinal Plants Unit – Siddha (CCRS), Mettur Dam, Salem district, Tamil Nadu and identified with the help of available literature. The collected specimens were identified and authenticated with the help of valid references (Gamble and Fischer, 1921–1935; Nair and Henry, 1983; Matthew, 1983; Daniel and Umamaheswari, 2001). Photographs of the area of study were taken with Pentax – K 1000, Canon – Power shot A710 *IS* camera in order to depict the contour and other important locality features. Oral history about the sacred groves was collected from elder generation to document the change that has taken place within a specific period.

Results and discussion

Sacred groves in Point Calimere

Point Calimere is associated with the Hindu epic, The Ramayana. The highest point of the cape, at an elevation of 4 m, is Ramarpadam, "Rama's feet" in Tamil (Fig. 1a and 1b). A stone slab bears the impressions of two feet and is understood to be the place where Rama stood and reconnoitred Ravana's kingdom in Sri Lanka. Large number of Rama devotees gathers here during the 2nd week of April to celebrate the Ram Navami Festival. Modi Mandapam is a shrine located near Ramarpadam (Fig. 1c). Hindu legend says that Lord Vedaraneswarer spends a night here with his consort during January - February. In the first week of March a major festival is held here. Sanyasi Muniaswar Kovil is a shrine between the eastern bank of Muniappan Lake and Kodikkarai road visited by devotees on all auspicious occasions. On March 20 a special Puja is celebrated here. Mattumunian Kovil (Fig. 1d and 1e) is a small temple in the south of the sanctuary where people worship and offer prayers throughout the year. A major festival is celebrated here on the 3rd Friday of September every year. Avulaiganni Dargah is the grave of a Muslim saint located near the road by Ramarpadam. His death anniversary is observed here at the end of November. Shevrayan Kovil is a shrine to the deities Shevrayan and Soni located deep in the forests of the northern part of the sanctuary. A small village near this shrine was now relocated outside the sanctuary after the creation of Kodikkarai Reserve Forest. Large congregations of devotees from Arcothurai (Akkaraipettai) celebrate a special festival here in June/July every year.

Bathing in the sea at Point Calimere is considered sacred by Hindus and a temple there is an object of pilgrimage. People from Tanjore and Nagapatinum districts visit this area on Adi amavasai (off moon day in the month of Tamil adi) and Thai amavasai (off moon day in the month of Tamil Tai) to pay rituals in remembrance of their departed souls. Sacred groves exist as holy places for worshiping Gods and Goddesses. Many of them have small shrines attached to them but Vanathurkai temple (Fig. 1g) has only a small holy place in the form of idol and a single tree for worship. Complex rituals are performed in almost all groves. Karuppana Samy and Karthavarayan are the prominent deities of male gods and Sri Gomathiamman is the famous female deity (Fig. 1f)). The Kodikkadu temple – Kuzhagar Kovil (Fig. 1h) is a Vaishnava temple and the deity is Kuzhazhagar. These temples and Dargah show that this area has a great religious significance.

Fig. 1: Sacred Groves at Point Calimere. a*:* Aerial view of the Ramarpatham at Point Calimere. b*:* A close up view of the "Rama's feet" c: A view of the badly damaged Modi Mandapam d*:* Deities of the Mattumunian Kovil; e*:* Avulaiganni Dargah - the grave of a Muslim saint f: A view of the Avulaiganni Dargah; g: A view of the Vanathurkai temple h*:* The aerial view of the Kuzhagar koil.

Table 1. List of plant species recorded in the Point Calimere Wildlife and Bird Sanctuary, Tamil Nadu, India.

S.no.	Botanical Name	Family	Habit	Vernacular name
1.	*Abrus precatorius* L.	Fabaceae	Climber	Kundumani
2.	*Abutilon indicum* (L.) Sweet	Malvaceae	Shrub	Thuthi, Nalla Thuthi
3.	*Acacia nilotica* (L.) Willd. ex Delile	Mimosaceae	Tree	Karuvelam
4.	*Acalypha fruticosa* Forssk.	Euphorbiaceae	Herb	-
5.	*Acalypha indica* L.	Euphorbiaceae	Herb	Kuppaimeni
6.	*Achyranthes aspera* L.W	Amaranthaceae	Herb	Nayuruvi
7.	*Aegle marmelos* (L.) Correa	Rutaceae	Tree	Vilvam
8.	*Aerva lanata* (L.) Juss. ex Schult.	Amaranthaceae	Herb	Peelai, Sirupeelai
9.	*Ageratum conyzoides* L.	Asteraceae	Herb	Poom Pillu
10.	*Albizia lebbeck* (L.) Willd.	Mimosaceae	Tree	Vaagai
11.	*Allmania nodiflora* (L.) R. Br. ex Wight	Amaranthaceae	Herb	Vallikeerai
12.	*Aloe vera* (L.) Burm. f.	Liliaceae	Herb	Chotrukathalai
13.	*Alternanthera sessilis* (L.) R. Br. ex DC.	Amaranthaceae	Herb	Ponnankanni
14.	*Alysicarpus monilifer* (L.) DC.	Fabaceae	Herb	Kasukkoti
15.	*Ammannia baccifera* L.	Lytharaceae	Herb	Neermel-Neruppu
16.	*Anisomeles malabarica* (L.)R. Br. ex Sims	Lamiaceae	Herb	Peimiratti
17.	*Aristolochia bracteolata* Lam.	Aristolochiaceae	Climber	Aduthinnappalai
18.	*Aristolochia indica* L.	Aristolochiaceae	Climber	Easwaramooli, Garudankoti
19.	*Asparagus racemosus* Willd.	Liliaceae	Climber	Thaneervittan Kilanzhu
20.	*Asystasia gangetica* (L.) T Anderson	Acanthaceae	Herb	Mitikeerai
21.	*Atalantia monophylla* (L.) Corr. Serr.	Rutaceae	Tree	Kaattu Elumichai
22.	*Azadirachta indica* A. Juss.	Meliaceae	Tree	Vaembu
23.	*Bacopa monnieri* (L.) Pennell	Scorphulariaceae	Herb	Neerbrahmi
24.	*Basilicum polystachyon* (L.) Moench	Lamiaceae	Herb	Sannaki Poondu
25.	*Benkara malabarica* (Lam.) Tiruvengadam	Rubiaceae	Shrub	Pudan
26.	*Bidens pilosa* L.	Asteraceae	Herb	Mukkuthi
27.	*Biophytum sensitivum* (L.) DC.	Oxalidaceae	Herb	Jala Pushpam
28.	*Blumea obliqua* (L.) Druce	Asteraceae	Herb	-
29.	*Boerhavia diffusa* L.	Nyctaginaceae	Herb	Mookarattai
30.	*Borassus flabellifer* L.	Aracaceae	Tree	Panai
31.	*Breynia vitis-idaea* (Burm. f.) C.B.C. Fisch	Cucurbitaceae	Shrub	Kattuniruri
32.	*Cadaba fruticosa* (L.) Druce	Capparaceae	Shrub	Vizhudhi
33.	*Calophyllum inophyllum* L.	Clusiaceae	Tree	Punnai
34.	*Calotropis giganteana* (L.) R. Br.	Asclepiadaceae	Shrub	Erukku
35.	*Canavalia virosa* (Roxb.) Wight &Arn.	Fabaceae	Climber	Kattuttambattan
36.	*Canthium parviflorum* Lam.	Rubiaceae	Shrub	Kaarai
37.	*Capparis sepiaria* L.	Capparaceae	Shrub	Karunchurai
38.	*Capparis zeylanica* L.	Capparaceae	Shrub	Athondai
39.	*Cardiospermum halicacabum* L.	Sapindaceae	Climber	Mudakotthan
40.	*Carissa spinarum* L.	Rubiaceae	Shrub	Sirukala
41.	*Cassia absus* L.	Ceasalpiniaceae	Herb	-
42.	*Cassia auriculata* L.	Ceasalpiniaceae	Shrub	Avarai
43.	*Cassia occidentalis* L.	Ceasalpiniaceae	Herb	Peiyavarai
44.	*Cassia roxburghii* DC.	Ceasalpiniaceae	Tree	-
45.	*Cassia tora* L.	Ceasalpiniaceae	Herb	Thagarai
46.	*Cathranthus roseus* (L.) G. Don	Apocynaceae	Herb	Nithyakalyani
47.	*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	Shrub	Madukkarai
48.	*Celosia argentea* L.	Amaranthaceae	Herb	Pannai keerai
49.	*Celosia polygonoides* Retz.	Amaranthaceae	Herb	-
50.	*Centella asiatica* (L.) Urb.	Apiaceae	Herb	Vallarai
51.	*Chloris barbata* Sw.	Poaceae	Herb	Kodaipullu
52.	*Cissampleos pareira* L.	Minispermaceae	Climber	Appatta, Puttittiruppi
53.	*Cissus quadrangularis* L.	Vitaceae	Climber	Pirandai

S.no.	Botanical Name	Family	Habit	Vernacular name
54.	*Cleome aspera* J. Koenig ex DC.	Capparaceae	Herb	-
55.	*Cleome gynandra* L.	Capparaceae	Herb	Nal Vaelai
56.	*Cleome viscosa* L.	Capparaceae	Herb	Kaattu Kaduku
57.	*Clerodendrum inerme* (L.) Gaertn.	Verbanaceae	Shrub	Pinarichanganguppu
58.	*Clitoria ternatea* L.	Fabaceae	Climber	Sankupushpam, Kaakanam
59.	*Coccinia grandis* (L.) Voigt.	Cucurbitaceae	Climber	Kovai
60.	*Cocculus hirsutus* (L.) Diels	Minispermaceae	Climber	Kattukodi
61.	*Commelina benghalensis* L.	Commelinacea	Herb	Kanaangozhai
62.	*Commiphora berryi* (Arn.) Engl.	Burusaraceae	Shrub	Mullu Kiluvai
63.	*Corchorus trilocularis* L.	Tiliaceae	Herb	-
64.	*Cordia diffusa* K.C. Jacob	Boraginaceae	Herb	-
65.	*Crataeva magna* (Lour.) DC.	Capparaceae	Tree	Mavilingam
66.	*Crotalaria tecta* Heyne ex Roth.	Fabaceae	Herb	-
67.	*Crotalaria verrucosa* L.	Fabaceae	Herb	Cankuniti
68.	*Cyanotis cristata* (L.) D. Don	Cyperaceae	Herb	-
69.	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb	Arugam Pullu
70.	*Cyperus iria* L.	Cyperaceae	Herb	Oosikorai
71.	*Cyperus kyllingia* Endlicher	Cyperaceae	Herb	Velutta Nirbasi
72.	*Cyperus rotundus* L.	Cyperaceae	Herb	Koraikilangu
73.	*Datura innoxia* Mill.	Solanaceae	Shrub	Oomatthai
74.	*Delonix elata* (L.) Gamble	Ceasalpiniaceae	Tree	Vaadhanarayanan
75.	*Dendrophthoe falcata* (L. f.) Etting.	Loranthaceae	Herb	Pulluruvi
76.	*Digera muricata* (L.) Mart.	Amaranthaceae	Herb	Thoyya Keerai
77.	*Dioscorea pentaphylla* L.	Dioscoreaceae	Climber	Kaattuvalli
78.	*Dodonaea viscosa* (L.) Jacq.	Sapindaceae	Shrub	Virali
79.	*Dolichos trilobus* L.	Fabaceae	Herb	-
80.	*Drosera burmannii* Vahl	Droseraceae	Herb	Azhukanni
81.	*Drosera indica* L.	Droseraceae	Herb	-
82.	*Drypetes sepiaria* (Wight &Arn.) Pax Hoffm.	Euphorbiaceae	Tree	Kalvirai
83.	*Ecbolium ligustrinum* (Vahl) Vollesen	Acanthaceae	Herb	Neelambaram
84.	*Eclipta prostrata* L.	Acanthaceae	Herb	Vellai Karisalakanni
85.	*Elytraria acaulis* (L. f.) Lindau	Asteraceae	Herb	Pumikatambam
86.	*Emilia sonchifolia* (L.) DC.	Asteraceae	Herb	Myualchevi
87.	*Enicostema axillare* (Lam.) Raynal	Gentianaceae	Herb	Vellarugu
88.	*Eragrostis japonica* (Thunb.) Trin.	Poaceae	Herb	Kanjirapul
89.	*Eriocaulon quinquangulare* L.	Eriocaulaceae	Herb	-
90.	*Euphorbia hirta* L.	Euphorbiaceae	Herb	Ammanpacharisi
91.	*Evolvulus alsinoides* L.	Convolvulaceae	Herb	Vishnukarandi
92.	*Ficus benghalensis* L.	Moraceae	Tree	Aal
93.	*Ficus microcarpa* L.	Moraceae	Tree	-
94.	*Ficus religiosa* L.	Moraceae	Tree	Arasu
95.	*Ficus virens* Alton.	Moraceae	Tree	Malai Icchi
96.	*Gmelina asiatica* L.	Acanthaceae	Shrub	Nilakkumizh
97.	*Gomphrena globosa* L.	Amaranthaceae	Herb	Vatamalli
98.	*Grewia umbellifera* Beddome	Tiliaceae	Shrub	-
99.	*Hedyotis corymbosa* (L.) Lam.	Rubiaceae	Herb	Kattukkayaver
100.	*Heliotropium indicum* L.	Boraginaceae	Herb	Thaelkodukku
101.	*Heliotropium marifolium* Retz.	Boraginaceae	Herb	-
102.	*Hemisdesmus indicus* (L.) R.Br. var. *indicus*	Asclepiadaceae	Climber	Nannaari
103.	*Hybanthus enneaspermus* (L.) F. Muell.	Violaceae	Herb	Orilai Thamarai
104.	*Hygrophila schulli* (Buch-Ham.) M. R. & S.M. Almeids	Acanthaceae	Herb	Neermulli
105.	*Hyptis suaveolens* (L.) Poir.	Lamiaceae	Herb	-
106.	*Indigofera aspalathoides*Vahl ex DC.	Fabaceae	Herb	Sivanaar Vaembu

S.no.	Botanical Name	Family	Habit	Vernacular name
107.	*Indigofera linnaei* Ali	Fabaceae	Herb	Sheppunerunji
108.	*Ipomoea obscura* (L.) Ker.	Convolvulaceae	Climber	-
109.	*Ixora pavetta* Andr.	Rubiaceae	Shrub	Culundu
110.	*Jasminum officinale* L.	Oleaceae	Climber	Malligai
111.	*Jasminum sambac* (L.) Ait.	Oleaceae	Climber	Malligai
112.	*Justicia adhatoda* L.	Acanthaceae	Shrub	Adhatoda
113.	*Lawsonia inermis* L.	Lytharaceae	Shrub	Maruthondri
114.	*Leucas aspera* (Willd.) Link	Lamiaceae	Herb	Thumbai
115.	*Limonia acidissima* L.	Rutaceae	Tree	Villa Maram
116.	*Lindernia antipoda* (L.) Alston	Scorphulariaceae	Herb	Thanneer Poondu
117.	*Ludwigia perennis* L.	Onagraceae	Herb	
118.	*Madhuca longifolia* (Koen.) Macbr. var. *latifolia* (Roxb,) A.Cheval	Sapotaceae	Tree	Illupai
119.	*Manilkara hexandra* (Roxb.) Dubard	Sapotaceae	Tree	Ulakkai-P-Paalai
120.	*Melochia corchorifolia* L.	Sterculiaceae	Herb	Punnakku Poondu
121.	*Memecylon umbellatum* Burm. F.	Melastomataceae	Tree	Alli, Anjani
122.	*Mimosa pudica* L.	Mimosaceae	Herb	Thotaal Surungi
123.	*Mimusops elengi* L.	Sapotaceae	Tree	Magizham
124.	*Mollugo cerviana* (L.) Ser.	Molluginaceae	Herb	Parpaadagam
125.	*Mollugo nudicaulis* Lam.	Molluginaceae	Herb	-
126.	*Mollugo pentaphylla* L.	Molluginaceae	Herb	Parpaadagam
127.	*Momordica dioica* Roxb. ex Willd.	Cucurbitaceae	Climber	Pazhupagal
128.	*Morinda pubescens* Sm.	Rubiaceae	Tree	Nuna
129.	*Mucuna pruriens* (L.) DC.	Fabaceae	Herb	Poonaikkaali
130.	*Mukia maderaspatana* (L.) M. Roem.	Cucurbitaceae	Climber	Musumusukkai
131.	*Nerium oleander* L.	Apocyanceae	Shrub	Aralli
132.	*Nothosaerva brachiata* (L.) Wight,	Amaranthaceae	Herb	-
133.	*Ochna obtusata* DC. var. *obtusata*	Ochnaceae	Shrub	Chilanti
134.	*Ocimum americanum* L.	Lamiaceae	Herb	Nai Thulasi
135.	*Ocimum tenuiflorum* L.	Lamiaceae	Herb	Nala Thulasi
136.	*Passiflora foetida* L.	Passifloraceae	Climber	Siruppoonaikkaali
137.	*Pavetta indica* L.	Rubiaceae	Tree	Pavattai
138.	*Pavonia odorata* Willd.	Malvaceae	Herb	Peramutti
139.	*Pedalium murex* L.	Pedaliaceae	Herb	Perunerunji
140.	*Pentatropis capensis* (L.f.) Bullock	Asclepiadaceae	Climber	Oopilakodi
141.	*Pergularia daemia* (Forssk.) Chiov.	Asclepiadaceae	Climber	Vaeliparuthi
142.	*Peristrophe paniculata* (Forssk.) Brummit	Acanthaceae	Herb	Kara-K-Kanchiram
143.	*Phyla nodiflora* (L.) Greene	Verbenaceae	Herb	Poduthalai
144.	*Phyllanthus amarus* Schum. &Thonn.	Euphorbiaceae	Herb	Keezhanelli
145.	*Phyllanthus emblica* L.	Euphorbiaceae	Herb	Nelli
146.	*Phyllanthus maderaspatensis* L.	Euphorbiaceae	Herb	Melanelli
147.	*Phyllanthus rotundifolius* Klein ex Willd	Euphorbiaceae	Herb	Thengaipoo
148.	*Physalis minima* L.	Malvaceae	Herb	Tholthakkali
149.	*Pisonia grandis* R. Br.	Nyctaginaceae	Tree	Illachikkettailai
150.	*Pleurostylia opposita* (Wall.) Alston	Celastraceae	Tree	Chiru Piyari, Karuvali
151.	*Polycarpaea corymbosa* (L.) Lam.	Caryophyllaceae	Herb	Nilaichedaichi, Katacciver
152.	*Polygala arvensis* Willd.	Polygalaceae	Herb	Milakunankai
153.	*Polygala bulbothrix* Dunn	Polygalaceae	Herb	-
154.	*Polygala javana* DC.	Polygalaceae	Herb	Selagachedi
155.	*Pongamia pinnata* (L.) Pierre	Fabaceae	Climber	Pungam
156.	*Portulaca oleracea* L.	Portulacaceae	Herb	Paruppu Keerai
157.	*Portulaca quadrifida* L.	Portulacaceae	Herb	Pasalai Keerai
158.	*Premna serratifolia* L.	Verbenaceae	Shrub	Pasumunnai
159.	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Herb	Aadai-Otti

S.no.	Botanical Name	Family	Habit	Vernacular name
160.	*Rivea hypocrateriformis* (Desr.) Choisy	Asclepiadaceae	Climber	Boddikkoora
161.	*Rothia indica* (L.) Druce	Fabaceae	Tree	Nurreypittan Keerai
162.	*Ruellia tuberosa* L.	Acanthaceae	Herb	Pattaskai
163.	*Salacia chinensis* L.	Celastraceae	Tree	Pon Korandi
164.	*Salvadora persica* L.	Salvadoraceae	Tree	Peru-Vila
165.	*Sapindus emarginatus* Vahl	Sapindaceae	Tree	Poovandikottai
166.	*Scilla hyacinthina* (Roth) J. F. Macbr.	Liliaceae	Herb	Kattu Velvenkayam
167.	*Scoparia dulcis* L.	Scrophpulariaceae	Herb	Sarakkotthini
168.	*Securinega leucopyrus* (Wild.) Mill.	Euphorbiaceae	Herb	Varat-Pula
169.	*Sida acuta* Burm. f.	Malvaceae	Herb	Ponmucuttai
170.	*Sida cordata* (Burm. f.) Borss. Waalk.	Malvaceae	Herb	Kurunthotti
171.	*Sida cordifolia* L.	Malvaceae	Herb	Chittamutti
172.	*Solanum americanum* Mill.	Solanaceae	Herb	Manathakali
173.	*Solanum tribolatum* L.	Solanaceae	Climber	Thuthuvalai
174.	*Sopubia delphinifolia* (L.) G. Don.	Scrophpulariaceae	Herb	-
175.	*Spermacoce hispida* L.	Rubiaceae	Herb	Naththaisuuri:
176.	*Sphaeranthus indicus* L.	Astreraceae	Herb	Kottai Karanthai
177.	*Strebulus asper* Lour.	Moraceae	Tree	Piray
178.	*Striga asiatica* (L.) Kuntze	Scrophpulariaceae	Herb	Pallipoondu,
179.	*Strychnos minor* Dennst	Loganiaceae	Tree	Kodi Etti
180.	*Synedrella nodiflora* (L.) Gaertn,	Asteraceae	Herb	Mudiyan Achchai
181.	*Syzygium cumini* (L.) Skeels	Myrtaceae	Tree	Naval
182.	*Tarenna asiatica* (L.) Kuntze ex K.Schum	Rubiaceae	Tree	Pavattachedi
183.	*Tephrosia maxima* Pers.	Fabaceae	Herb	-
184.	*Tephrosia purpurea* (L.) Pers.	Fabaceae	Herb	Kolunchi.
185.	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	Combretaceae	Tree	Marutu
186.	*Terminalia catappa* L.	Combretaceae	Tree	Nattuvadumai
187.	*Thespesia populnea* (L.) Sol. ex Correa	Malvaceae	Tree	Puvarasu
188.	*Tinospora cordifolia* (Willd.) Miers ex Hook f. &Thoms.	Minispermaceae	Climber	Seendil Kodi.
189.	*Toddalia asiatica* (L.) Lam.	Rutaceae	Shrub	Kattu-Milaku
190.	*Tranthema portulacastrum* L.	Aizoaceae	Herb	Sharunnai
191.	*Tribulus terrestris* L.	Zygophyllaceae	Herb	Nerunji Mull
192.	*Trichodesma indicum* (L.) R. Br.	Boraginaceae	Herb	Kiluttaitumpai,
193.	*Trichosanthes cucumerina* L.	Cucurbitaceae	Climber	Kattuppeypputal
194.	*Trichosanthes tricuspidata* Lour.	Cucurbitaceae	Climber	Kurattai
195.	*Tridax procumbens* L.	Asteraceae	Herb	Vettukkaaya-Thalai
196.	*Triumfetta rhomboidea* Jacq.	Tiliaceae	Herb	Puramutti
197.	*Triumfetta rotundifolia* Lam.	Tiliaceae	Herb	Adayotti
198.	*Tylophora indica* (Burm. F) Merr.	Asclepiadaceae	Climber	Nancharuppan
199.	*Urginea indica* (Roxb.) Kunth	Liliaceae	Herb	Nari-Venkayam
200.	*Vernonia cinerea* (L.) Less	Asteraceae	Herb	Naichotte Poondu
201.	*Vicoa indica* (L.) DC.	Asteraceae	Herb	-
202.	*Vitex negundo* L.	Verbanaceae	Shrub	Nocchi
203.	*Walsura trifolia* L.	Meliaceae	Tree	Kanjimaram
204.	*Waltheria indica* L.	Sterculiaceae	Herb	-
205.	*Wattakaka volubilis* (L. f.) Stapf.	Asclepiadaceae	Climber	Ankara-Valli
206.	*Wrightia tinctoria* (Roxb.) R. Br.	Rubiaceae	Tree	Veppalai
207.	*Xanthium indicum* J. Konig	Asteraceae	Herb	Maruluummatti
208.	*Ziziphus oenoplia* (L.) Mill.	Rhmnaceae	Tree	Surai Ilantai
209.	*Ziziphus xylopyrus* (Retz.) Willd.	Rhmnaceae	Tree	Kottai-Elandai
210.	*Zornia diphylla* (L.) Pers.	Fabaceae	Herb	Chirupalatai

There is diversity in deities worshipped. Each has a presiding deity and most of them have associated deities too. Presiding deity may be a God, Goddess or Serpent. Snake is also the associated deity in some sacred groves.

The rituals represent a mixture of the practices of an agrarian society and a hunting society. There are folklores explaining the power of each deity. Folklores have evolved into myths which compel the society to worship deities and to perform rituals. Strong taboos prevented the society from exploiting the resources of the sacred groves.

Vegetation of the Sacred Groves

The sacred forests of this region are ecologically better preserved. The forest type is mostly of wet evergreen. A few have drier types ranging from semi-evergreen to deciduous. All maintain fertility of soil and purity and humidity of air in the surroundings. The neighbouring lands get water from them. They are the centres of village biodiversity.

Our survey revealed the abundance of sacred groves in this area. Six groves are located in the area of study. The groves are having size of 5 cents. The tropical climate of the locality supports growth of evergreen species, resulting in the majority of the groves having evergreen vegetation. The Kodikkadu temple grove is semi-evergreen. The area consists of stunted, almost exclusively formed of bushed much branched plant species measuring 2 to 4 m in height. Here and there emerge some evergreen arborescent shrubs under 10 m in height with dark green voluminous crowns. Being accessible, this vegetation is often traversed by man and openings are made in places. Also, some anthropic stages appear here and there with anthropochore trees like *Syzygium cumini, Borassus flabellifer, Lannea coromandelica* and *Manilkara hexandra*.

This is the most productive vegetation of the forest in terms of biomass as well as utility. Dendroid forms of *Manilkara, Calophyllum, Walsura, Syzygium, Dryptes* and climbers or stragglers like *Mucuna, Canavalia, Salacia, Cissus, Toddalia, Tinospora* occur here are valuable as food and medicine.

The six groves support 210 species of angiosperms covering 172 genera under 64 families. Herbs, shrubs, trees and climbers represent 117, 25, 39 and 29 species respectively. It bears species with edible fruits, species having sacred value, species used as timber plants, species having firewood and medicinal values, of which a few are rapidly vanishing from the surrounding forest areas. In dicots 195 species are representing 58 families. Among the dicots, family Fabaceae is the most dominant with 15 species. Family Rubiaceae and Asteraceae are represented by 11 species each. In Monocot 15 species are representing 6 families. Among the monocots, the most dominant family is *Cyperaceae* (4 species). One species of Lichen (*Rocella*), two species of Pteridophytes (*Marselia*) and one species of Bryophyte (*Riccia*) are also recorded in the area of study. Insectivores plants like *Drosera burmannii*, and *Drosera indica* have been recorded in the area of study. *Dryptes sepiaria* and *Manilkara hexandra*, *Ficus microcarpa* and *Aegle marmelos* are treated most important as sacred trees. Lord Vanathurka is placed under the *Manilkara hexandra* tree, which is around 200 years old having around 2 mt. circumferences. *Dendrophthoe falcata* is a parasite on tree species like *Azhadirachta, Sapindus* etc. During the rainy season, aquatic ephemerals such as *Ludwigia Lindernia, Bacopa, Marsilea* etc., come up. *Prosopis* an introduced plant is progressively encircling patches of natural vegetation and strangles them extending inwards.

Salvadora persica is classified as 'Least Concern' in the IUCN Red List of Threatened Species 2019. *Drosera indica* and *Drosera burmanni* are carnivorus plants used extensively in herbal medicine and are also classified as 'Least Concern' in the IUCN Red List of Threatened Species 2013. The study reported *Breynia vitis-idaea* is exclusively insular, based on the literature available in Flora of Gulf of Mannar (Daniel and Umamaheshwari, 2001). *Commiphora berryi* is a peninsular endemic species recorded in the present study. *Cleome aspera, Corallacarpus epigaeus, Indigofera aspalathoides, Pentatropis capensis, Sopubia delphinifolia, Terminalia arjuna, Zizyphus mauritiana* and *Z. Xylopyrus* are distributed exclusively to Sri Lanka and Peninsular India as cited in the Flora of Gulf of Mannar (Daniel and Umamaheshwari, 2001).

Ecological significance of sacred groves

From time immemorial, the sacred groves in India have been the focus and symbol of a way of life. In such groves the highest levels of biological diversity are still found; there humans interact with nature. Ecologically valuable species function as keystone species in an ecosystem and contribute to the enhancement of biodiversity (Ramakrishnan, 1996). They are also species that are socially valued by the local village communities for cultural and religious reasons. The present investigation reveals that each grove is maintaining a microclimate with rich biodiversity. The selected groves show the existence of many species of medicinal plants. In the six groves, 210 species of flowering plants were recorded. The abundant and widely distributed families are *Fabaecae, Rubiaceae, Euphorbiaceae* and *Moraceae*. Very common genera are *Sida acuta, Abrus precatorius*, *Acanthus ilicifolius, Phyllanthus amarus, Drosera burmannii*, *Drosera indica* and *Ocimum tenuiflorum*. Large trees such as *Dryptes sepiaria, Manilkara hexandra, Ficus racemosa, Sapindus emarginatus, Salvadora persica, Syzygium cuminii, Aegle marmelos* and *Walsura trifolia* are the other species found in the groves. Another remarkable feature of the groves is the luxuriant growth of *Cressa cretica* and *Eriocaulon quinquangulare*. Medicinal plants like *Aegle marmelos, Phylllanthus emblica, Tinospora cordifolia, Capparis zeylanica, Mucuna pruriens, Asparagus racemosus, Solanum trilobatum, Phyllanthus amarus* and *Aloe vera* are very common in groves. From the floristic study it is clear that these sacred groves are the remarkable treasure-houses of biodiversity of Point Calimere. So, from the conservation point of view, these groves are most useful for *in situ* conservation of biodiversity.

The general phytosociology of sacred grove is extremely complex. Woody plants are the dominant species which include trees and lianas. The sacred groves of Point Calimere show remarkable physiognomic features in stratification, girth class, presence of epiphytes, vines, lianas, etc., due to the specific characteristics of the locality and the various degrees of interference made by the associated fauna and by man. The three strata of trees, shrubs and herbs, climbers and stragglers, epiphytes and parasites are the floristic elements of a grove. Here, the upper canopy includes trees with straight and slender trunk and branches are produced at the top. Common emergent tree species are *Manilkara hexandra, Syzygium cumini, Calophyllum inophyllum, Pleurostylia opposita, Sapindus emarginatus, Ficus racemosa* and *Walsura trifolia*. The second stratum includes members like *Mimosops elengi, Canthium dicoccum, Ochna obtusata* and *Cassia fistula*. The lower stratum consists of species like *Memecylon umbellatum, Todallia asiatica, Gmelina asiatica, Capparis sepiaria* and *Dryptes sepiaria*. Due to the massive growth of spreading climbers like *Abrus precatorius, Asystasia gangetica, Tinospora cordifolia, Trichosanthes cucumerina, Mucuna pruriens, Cappariis zeylanica, Canavalia virosa* and *Salacia chinensis* the canopy is more or less continuous. The herbaceous flora in a sacred grove is rain-dependent and most of them are annuals. The number of herbaceous plants is less in dry season. The density and species composition appearance of herbaceous flora is according to their demand for light. Luxuriant herbaceous vegetation is found where the canopy is open.

Sacred groves preserve biodiversity within their boundaries. Now they are under threat. The loss of faith, extraction of timber, shifting of deity/restricting the abode of the deity, clearing of groves for development activities, biomass removal**,** poaching and migration and occupation of lands by people of other faiths are the existing threats and major reasons for the decline of sacred groves. Some of the families settled nearby were dependent on the forests for their energy requirement. A part of this was collected from this grove. Despite the high reverence for this forest and regulations attached, the firewood collectors, who were mostly identified as non-locals, did not spare the grove. This was another added challenge for the long-term survival of this natural repository. Continuous fodder collection was noticed as a prominent threat. Most rural populace owned some grazing animal for which large quantities of forage were harvested from this grove. A number of wild edibles were abundance in the grove. Locals were making collections even during this survey. This process could adversely impact the rates of natural regeneration of many species of plants that serve the double purpose of being useful to man and some faunal species.

Conservation of biodiversity and maintenance of the eco-system is of overriding importance for the survival of the human race itself. The sacred groves have played a role in that endeavour. Those benefits might, however, soon be lost if they are allowed to be degraded or destroyed. Thus, protection of sacred groves must gain priority over other less important goals. Further detailed exploration of sacred groves in Tamil Nadu is an immediate requirement to assess their composition, various threat factors and conservation potential for their existence. Such gene pool reserves can definitely serve as icons of *in situ* conservation under the prevailing times through a good mix of scientific measures and awareness building efforts with the active involvement of the local community and the government.

Conflict of interest statement

Authors declare that they have no conflict of interest.

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References

Daniel, P., Umamaheswari, P., 2001. The Flora of the Gulf of Mannar, Southern India. Botanical Survey of India, Coimbatore.

Gamble, J.S., Fischer C. E. C., 1921-1935. Flora of Presidency of Madras, Vol. I, II and III. London, Adlard and Son Ltd.

Khan, M. L., Ashalata Devi, K., Tripathi R. S., 2008. The sacred groves and their significance in conserving biodiversity - An overview. Int. J. Ecol. Environ. Sci. 34(3), 277-291.

Malhotra, K. C., Gokhle, Y., Chatterjee, S., Srivastava, S., 2001. Cultural and Ecological Dimensions of Sacred Groves in India, INSA, New Delhi.

Matthew, K. M., 1983. Flora of Tamil Nadu Carnatic. The Raphinat Herbarium Tiruchirapalli, India.

Nair, N. C., Henry, A. N., 1983. Flora of Tamil Nadu, India Series 1: Analysis. Vol. I - III. Botanical Survey of India, Coimbatore.

Ramakrishnan, P. S., 1996. Shifting Agriculture and Sustainable Development. MAB Series, UNESCO, Paris.

Samati, H., Gogoi, R., 2007. Sacred Groves in Meghalaya. Curr. Sci. 93(10), 25.

Swain, P. K., Siva Ramakrishnan, I., Murty, B. L. N., 2008. Sacred groves- Their distribution in Eastern Ghats region. EPTRI - ENVIS Newslett. 14(4), 4.

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