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FLORISTIC ANALYSIS OF A SACRED GROVE POLATHALA, Y.S.R KADAPA DISTRICT, ANDHRA PRADESH.

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ABSTRACT: The present study deals with floristic diversity and phytosociological analysis of plants recorded in a sacred grove Polathala, YSR Kadapa District. It is situated in the Eastern Ghats of Andhra Pradesh, India. A total of 169 plant species belonging to 132 genera and 48 families are available, trees represent 56 species, 43 genera and 22 families Shrubs represent with 30 genera and 20 families, Herbs represent with 51 genera, 58 species and 23 families are inventoried. The Climbers include 16 species, 16 genera and 8 families. Only one parasite species recorded. A total of 465 Tree individuals (≥10cm GBH) in 0.01ha, 431 Shrubs/0.0025 ha were recorded. The GBH Class distribution of the trees revealed that majority of tree individuals (57%) occurred in the lower GBH Class (10-30cm) followed by 31-50 cm GBH (36%) , 51-70 cm GBH (6%),71-90 - cm GBH (1%) and > 90cm GBH (<1%).The Population has shown the reverse "J" Shaped curve indicating a regenerating type of forest in the Sacred grove.
Key Words: Sacred Grove, Polathala, Flora

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INTRODUCTION

A culturally preserved forest is known as sacred grove. Many sacred groves in India are known to harbour significant number of plants with medicinal value and eco-cultural importance. Sacred groves can form a significant means of insitu conservation of genetic diversity. They are conserved through social, cultural and environmental values since time immemorial. The groves are not only important sites for regional diversity but also provide vital ecosystem services to local people. In India, Gadgil and Vartak [1] have initiated the way for scientific study of sacred grove. They play an important role in the conservation of natural resources. Sacred groves can be used as indicators for potential natural vegetation and are vital for wellbeing of society. Sacred groves help in soil and water conservation besides preserving perennial water sources and are after the only source for many of the animals and birds that make them their habitat especially during summer [2]. Due to urbanization, industrialization and rationalization, scarcity of land leading to the depletion of the cover and shrinkage of these areas as a result the large chunk of the areas are diverted for other activities and only a small portion maintained near the temple [3]. A total of 100 major groves have been recorded from the Southern Andhra Pradesh region, and together they are home to about 1100 wild and naturalized vascular plant species. There is a need to take serious efforts to conserve these groves from further depletion.

The degradation of forests and destruction of habitat due to anthropogenic activities is the major cause of decline in the flora in sacred grove of Polathala. Polathala abodes a famous temple of Lord Shiva and during the Shivarathri more than three lakh pilgrims visit the temple and keep vigil the whole night. The pilgrims' generally visit the temple especially on Monday and Fridays throughout the year. Due to frequent visit of people to the temple lot of disturbance are occur in the forest area causing loss of biodiversity. The flora of this sacred grove has not been studied earlier. Hence the floristic and Phyto sociological survey has been done.

Study area

The study area Polathala sacred grove is situated in Pendlimarii Mandal, Kadapa district in Andhra Pradesh and is nearby Pondula Bodu, Boggula Konda and Gangalapalli reserve forest and it covers 3375 ha area. The distance between Kadapa town to Polathala by road approximately 24 km. It lies between 14^0 22` - $21^0$ 7` North Latitude and 78'40` - 48'9` East longitude. The average elevation is 359 m and the mean annual temperature varies between 31^0C and 46^0C in May. The average annual rainfall is 700mm.

MATERIALS AND METHODS

Floristic inventory was carried out in the Polathala sacred grove, kadapa for about three months from December 2016 to February 2017. All the plant life forms trees, shrubs and herbs were recorded. Plant specimens were collected through several field trips, pressed dried and stitched on herbarium sheets according to [4].The specimens were identified with the help of standard floras [5] and deposited in Yogi Vemana University, Kadapa.

Phytosociological studies were carried out by using quadrate method. The quadrats were laid down all sides of the scared grove in random manner. The size and number of quadrates needed were determined by using species area curve. 20 quadrats of 1x1m size were placed for herbs, 5x5m size for shrubs and 10x10m size for trees laid down randomly at the different areas of the Polathala sacred grove. Frequency; density and basal area were calculated following. Relative frequency 'relative density 'relative dominance and important value index (IVI) for individual species were calculated according to [6]. Species richness was determined to the total number of species present in the studied site; species diversity was measured using Shannon diversity index.

RESULTS

Floristic analysis

A comprehensive floristic inventory carried out in Polathala sacred grove yielded a total of 175 plant species. They belong to 138 genera and 49 families (Table -1) Among them, trees represented 58 species, 45 genera and 22 families which form 33% of total species. Herbs represent 59 species, 53 genera of 23 families. The herb species share 34% of total species. A total of 41 shrub species and 32 genera with 20 familes are inventoried. The shrub share is 23% of total species. The climbers include 16 species and 16 genera under 8 families. They form 9% of total species. Only one parasite species "*Dendrophthoe falcate*" was recorded (Table -2).

Among all families Fabaceae was the dominant family with 16 species and 13 genera followed by Euphorbiaceae with 15 species and 8 genera. The other main contributing families are Caesalpinaceae (10 species and 6 genera), Poaceae (8 species and 8 genera) Malvaceae (7 species and 5 genera), Mimosaceae (7 species and 4 genera) and Tiliaceae (7 species and 3 genera). 18 families had only one species in each of them. Dicots featured high proportion of total 159 species (90.85%) belonging into 112 genera of 42 families and monocots include 15 species (8.6%) belonging 15 genera and 6 families. A pteridophyte *Actiniopterisradiata* was also recorded.

Fabaceae was found to be the dominant tree family with 6 species and 4 genera. The family Euphorbiaceae formed the dominant shrub family with 5 species and 4 genera. Poacae represented heighest number of herbs (8 species and 8 genera). Asclepidaceae and Fabaceae families contain climbers the single parasite species belongs to *Dendrophthoe fálcate* Loranthaceae family.

Among the recorded 170 plant species, the maximum number of 85 species (i.e 48.5%) is of medicinal importance. Scared groves are rich sources and best repository of medicinally important plants. *Strychnosnux-vomica* used against control of high blood pressure and *Sidaacuta* used against various skin deceases.

Table 1: List of plant species present in Polathala and their uses.

S.No	BOTANICAL NAME	FAMILY	HABIT	LOCAL NAME	USES
1	*Abrusprecatorius* L.	Fabaceae	Climber	Guruvindha	Medicinal
2	*Abutilon indicum*(L.)	Malvaceae	Shrub	Thuthurubenda	Medicinal
3	*Acacia chundra*(Rottler)	Mimosaceae	Tree	Cutch tree	Weed
4	*Acacia nilotica*(L.)	Mimosaceae	Tree	Nallatumma	Gums & resins
5	*Acanthospermumhispidum* DC.	Asteraceae	Herb	kukkamullachettu	weed
6	*Achyranthesaspera* L.	Amaranthaceac	Herb	Utthareni	Medicinal
7	*Actiniopterisradiata*(Sw.)	Actiniopteridaceae	Herb	Nemaliadugu	Medicinal
8	*Aervalanata* (L.)	Amaranthaceae	Herb	Kondapindi	Medicinal
9	*Ageratum conyzoides* L.	Asteraceae	Herb	Pumpullu	Medicinal
10	*Alangiumsalvifolium* (L.f.)	Alangiaceae	Tree	Uduga	Timber
11	*Albiziaamara*(Roxb.)	Mimosaceae	Tree	Chigara	Timber
12	*Albizialebbeck*(L.)	Mimosaceae	Tree	Derisenamu	Timber
14	*Aloe vera*(L.)	Liliaceae	herb	Kalabandha	Medicinal
15	*Alstoniascholaris* (L.)	Apocynaceae	Tree	Adukulapalu	Timber
16	*Alternantherasessilis* (L.)	Amaranthaceae	Herb	Ponnagantikura	Vegetable
17	*Amaranthusviridis* L.	Amaranthaceae	Herb	Thotakura	Vegetable
18	*Andrographispaniculata* (Burm.f.)	Acanthaceae	herb	Nelavemu	Medicinal
19	*Annonasquamosa* L.	Annonaceae	Tree	Siithapalam	Edible fruit
20	*Aristidaadscensionis* L.	Poaceae	Herb	Cheepuru	weed
21	*Asparagus racemosus* willd.	Liliaceae	Climber	Pilliteegalu	Medicinal
22	*Atalantiamonophylla* (Roxb.)	Rutaceae	Tree	Adavinimma	Timber
23	*Azadirachtaindica*A.	Meliaceae	Tree	Vepa	Timber, medicinal
24	*Bauhinia racemosa* Lam.	Caesalpiniaceae	Tree	Pachhari	Medicinal
25	*Blepharisrepens*(Vahl)	Acanthaceae	Herb	Bhoomipathra	Medicinal
26	*Boerhaviaerecta*L.	Nyctaginaceae	Herb	ThellaAratimamidi	Medicinal
27	*Bouganvilleaspectabilis* Willd.	Nyctaginaceae	Shrub	Kagithapupulu	Oranamental
28	*Brachiariaramosa* (L.)	Poaceae	Herb	Adhurugaddi	weed
29	*Brassica nigra* (L.)	Brassicaceae	Herb	Nallaavalu	Spices
30	*Brideliamontana* (Roxb.)	Euphorbiaceae	Tree	Patangi	Timber
31	*Buchananiaaxillaris* (Desr.)	Anacardiaceae	Tree	Sarapappu	Edible
32	*Cabretumalbidum* G	combretaceae	climber	Yadhatheega	Medicinal
33	*Cadabafruticosa*(L.)	Capparaceae	Shrub	Uttarasi	Weed
34	*Cajanuscajanifolius* (Haines)	fabaceae	shrub	Nallapooli	Medicinal
35	*Calotropisprocera* (Alton)	Asclepiadaceae	Shrub	Errajulledu	Medicinal
36	*Calotropisgigantia*(L.)	Asclepiadaceae	Shrub	Jilledu	Medicinal
37	*Canthiumcoromandelicum* (Burm.f.)	Rubiaceae	Shrub	Balusu	Medicinal

Table-1 cont……

38	*Capparissepiaria* L.	Sapindaceae	Shrub	Nallauppi	Medicinal
39	*Cardiospermumhalicacabu* mL.	Sapindaceae	Climber	Buddakakara	Medicinal
40	*Carissa carandas* L.	Apocynaceae	Tree	Vaaka	Edible
41	*Cassia accriculata* L.	Caesalpiniaceae	Shurb	Thangedu	Medicinal
42	*Cassia fistula* L.	Caesalpiniaceae	Tree	Rela	Timber
43	*Cassia montana*Roth	Caesalpiniaceae	Shrub	Pagadithangedu	Non timber
44	*Cassia occidentalis* L.	Caesalpiniaceae	Shrub	Kasivinda	Medicinal
45	*Cassia tora* L.	Caesalpiniaceae	Herb	Gundumusara	Medicinal
46	*Catharanthusroseus*(L.)	Apocynaceae	Herb	Billaganneru	Medicinal
47	*Catunaregamspinosa* (Thumb.)	Rubiaceae	Shrub	Manga	Medicinal
48	*Chlorisbarbata* Sw.	Poaceae	Herb	Kanupugaddi	Weed
49	*Chloroxylonswietenia* DC.	Rutaceae	Tree	Billudu	Timber
50	*Citrulluscolocynthis* (L.)	Cucurbitaceae	Climber	Chittipapara	Medicinal
51	*Cleistanthuscollinus*(Roxb.)	Euphorbiaceae	Tree	Kodisha	Timber
52	*Clitoriaternatea* L.	Fabaceae	Climber	Shankupuvvu	Medicinal
53	*Cocciniagrandis*J.	Cucurbitaceae	Climber	Dhonda	Vegetable
54	*Coccuslushirsutus*(L.)	Menisperaceae	Climber	Dusaratheega	Medicinal
55	*Cocusnucifera* L.	Arecaceae	Tree	Coconut	Edible
56	*Commelinabengalensis* L.	Commelinaceae	Herb	vennavedhuru	Shade
57	*Conocarpuserectus* L.	Combraetaceae	Tree	Dubaiteak	Shade,Ornamental
58	*Corchorusaestuans*L.	Tiliaceae	Herb	Nelabeera	Vegetable
59	*Corchoruscapsularis*L.	Tiliaceae	Herb	Goninara	Jute
60	*Corchorustrilocularis*L.	Tiliaceae	Shrub	Bankithutthura	Weed
61	*Cratevamagna*(Lour.)	Capparaceae	Tree	varuna	oranamental
62	*Crossandrainfundibuliformis* (L.)	Acanthaceae	Herb	Kanakambaram	Oranamental
63	*Croton bonplandianum*Baill.	Euphorbiaceae	herb	Galivanachettu	Medicinal
64	*Croton scabiosus*Bedd.	Euphorbiaceae	Tree	Vellichilla	Medicinal
65	*Cymbopogoncoloratus* (Hook.f.)	Poaceae	Herb	Bodhagaddi	Industrial use
66	*Cynodondactylon* (L.)	Poaceae	Herb	Garika	Medicinal
67	*Cyperusrotundus*	cyperaceae	Herb	Thungamusti	Medicinal
68	*Dactylocteniumaegyptium* (L.)	Poaceae	Herb	Ganukugaddi	Grass, non timber
69	*Dalbergialanceolaria* L.f.	Fabaceae	Tree	yerrapacchari	Timber
70	*Dalbergiapaniculata* Roxb.	Fabaceae	Tree	Pacchari	Timber
71	*Dalbergiasissoo* Dc.	Fabaceae	Tree	irugudu	Timber
72	*Datura metal* L.	Solanaceae	Herb	Hindu Datura	Medicinal

Table-1 cont……

73	*Dendrophthoefalcata* (L.f.)	Loranthaceae	Partial stem parasite	Badhanika	Medicinal
74	*Derris scandens*(Roxb.)	Fabaceae	Climber	Chakalitega	Medicinal
75	*Dichrostachyscinerea* (L.)	Mimosaceae	Shrub	Venuthuru	Timber
76	*Diospyroschloroxylon* Roxb.	Ebenaceae	Tree	ulindha	Timber
77	*Diospyrosmelanoxylon* Roxb.	Ebenaceae	Tree	Beediaaku	Timber
78	*Dodonaeaviscosa* (L.)	Sapindaceae	Shrub	Bandharu	Medicinal
79	*Dolichandroneatrovirens* (Roth)	Bignoniaceae	Tree	Neeroddhi	Firewood
80	*Dolichos lablab* L.	Fabaceae	Climber	Chikkudu	Vegetable
81	*Eclipta alba* (L.)	Asteraceae	Herb	Brungaraja	Medicinal
82	*Erythroxylummonogynum* Roxb.	Erythroxylaceae	Shrub	Devadhari	Medicinal
83	*Euphorbia antiquorum* L.	Euphorbiaceae	Shrub	Peddhajemudu	Medicinal
84	*Euphorbia caduciflia* Haines	Euphorbiacae	Shrub	Kattejemmudu	Medicinal
85	*Euphorbia hirta* L.	Euphorbiaceae	Herb	Reddivarinanabalu	Medicinal
86	*Euphorbia tirucalli* L.	Euphorbiaceae	Tree	Kadajemudu	Medicinal
87	*Evolvulusalsinoides*(L.)	Convolvulaceae	Herb	Vishnukrantum	Medicinal
88	*Ficusbenghalensis* L.	Moraceae	Tree	Marri	Timber, firewood
89	*Ficushispida* L.f.	Moraceae	Tree	Bramhamedi	Firewood,edible
90	*Ficusreligiosa* L.	Moraceae	Tree	Raavi	Shade,Firewood
91	*Gardenia gummifera*L.f.	Rubiaceae	Tree	Bikki	Firewood,Edible
92	*Givotiamoluccana* (L.)	Euphorbiaceae	Tree	Tellapuliki	Firewood ,Industrial
93	*Grewiaasiatica* L.	Tiliaceae	Tree	Nallajana	Edible
94	*Grewiahirsuta*Vahl	Tiliaceae	Tree	kondathada	Timber
95	*Grewiatilifolia*Vahl	Tiliaceae	Tree	Adavichamanthi	Timber
96	*Gymnemasylvestre*(Retz.)	Asclepiadaceae	Climber	Podapathri	Medicinal
97	*Hardwickiabinata*Roxb.	Caesalpiniaceae	Tree	narepi	Timber
98	*Helicteresisora*L.	Sterculiaceae	Tree	Nulikaya	Medicinal
99	*Hemidesmusindicus* (L.)	Asclepiadaceae	Climber	Sugandhipala	Refrigerant
100	*Heteropogancontortus* (L.)	Poaceae	Herb	Pucchikagaddi	Medicinal,Industrial
101	*Hyptissuaveolens*(L.)	Lamiaceae	Shrub	Gabbuthulasi	Medicinal
102	*Indigiferacardifolia*Heyne	Fabaceae	Herb	Paparaalumu	Medicinal
103	*Indigoferalennaei* Ali	Fabaceae	Herb	Yarrapalleru	Medicinal
104	*Jasminumauriculatumvahl*	oleaceae	Shrub	Adavimalle	oranamental
105	*Jasminumfluminensevel*l.	oleaceae	Shrub	Sannajaji	oranamental
106	*Jasminumsambac*(L.)	oleaceae	Shrub	Gundumalle	oranamental
107	*Jatrophagossypifolia*L.	Euphorbiaceae	Shrub	Verriamudham	Medicinal
108	*Lagenariasiceraria* (Molina)	Cucurbitaceae	Climber	Bottle gourd	Vegetable

Table-1 cont……

109	*Lanneacoromandalica* (Houtt.)	Anacardiaceae	Tree	Guppidi	Timber
110	*Lantana camara* (L.)	Verbenaceae	Shrub	Akshnthapulu	Medicinal
111	*Leonotisnepetifolia*(L.)	Lamiaceae	Herb	Yerrathummi	Medicinal
112	*Leucasaspera*(Willd.)	Lamiadeae	Herb	thummi	Medicinal
113	*Mangiferaindica* L.	Anacardiaceae	Tree	Mango	Edible
114	*Merremiatridentata* (L.)	Convolvulaceae	Herb	Seethammasavaram	Medicinal
115	*Moringaoleifera* Lam.	Moringaceae	Tree	Munaga	Vegetable
116	*Mullugonudicaulis* Lam.	Molluginaceae	Herb	Parpatakamu	Medicinal
117	*Murrayakoenigii*(L.)	Rutaceae	Tree	Karivepaku	Vegetable
118	*Musaparadisiaca* L.	Musaceae	Herb	Arati	Edible
119	*Naringicrenulata* (Roxb)	Rutaceae	Tree	Thorrivelaga	Medicinal
120	*Nerium oleander* L.	Apocynaceae	Shrub	Ganneru	oranamental
121	*Ocimumgratissimum* L.	Lamiaceae	Shrub	Ramathulasi	Medicinal
122	*Ocimum sanctum* L.	Lamiaceae	Herb	Krishna Thulasi	Medicinal
123	*Oldenlandiaumbellata* L.	rubiaceae	Herb	chiruveru	Medicinal
124	*Opuntiastricta* (kerGawl.)	Cactaceae	Shrub	Nagajemudu	Medicinal
125	*Partheniumhysterophorous* L.	Asteraceae	Herb	Congress Weed	Medicinal
126	*Pavoniazeylanica* (L.)	Malvaceae	Herb	Karubenda	Medicinal
127	*Pergulariadaemia* (Forssk.)	Asclepiadaceae	Climber	Juttupaku	Medicinal
128	*PerotisIndica* (L.)	Poaceae	Herb	Nallathokagaddi	Weed
129	*Phyllanthusamarus* Schumach	Euphorbiaceae	Herb	Nelausiri	Medicinal
130	*Phyllanthusmadaraspatensis* L.	Euphorbiaceae	Herb	Adavinelausiri	Medicinal
131	*Phyllanthuspinnatus* (Wight)	Euphorbiaceae	Shrub	Nallapooli	Forest species
132	*Phyllanthusvirgatus* G.Forst	Euphorbiaceae	Herb	Ucchiusirika	Medicinal
133	*Physalis minima* L.	Solanaceae	Herb	Buddabusada	Medicinal
134	*Plumeria alba* L.	Apocynaceae	Tree	Devaganneru	oranamental
135	*Pongamiapinnata* (L.)	Fabaceae	Tree	Kanuga	Shade, Medicinal
136	*Premnatomentosa*Willd.	Verbenaceae	Tree	Narava	Timber
137	*Prosopis cineraria* (L.)	Mimosaceae	Tree	Jemmi	Shade,Timber
138	*Prosopisjuliflora*(Sw.)	Mimosaceae	Tree	Karrathumma	Firewood
139	*Pterocarpussantalinus* L.f.	Fabaceae	Tree	Errachandanam	Timber
140	*Pterolobiumhexapetalum* (Roth)	Caesalpiniaceae	Shrub	Pariki	Firewood,edible
141	*Pupalialappaceae* (L.)	Amaranthaceae	Shrub	Thutthureni	Edible,Medicinal
142	*Sarcostemmaacidum* (Roxb.)	Asclepiadaceae	Climber	Pullangiteega	Medicinal
143	*Scutiamyrtina* (Burm.f.)	Rhaminaceae	Shrub	gariki	Edible,Medicinal
144	*Securinegaleucopyrus* (Willd.)	Euphoriaceae	shrub	Tellapurugudu	Medicinal

Table-1 cont……

145	*Sennaoccidentalis*(L.)	Caesalpiniaceae	Shrub	Kasivinda	Medicinal
146	*SidaacutaBurm*.f.	Malvaceae	Herb	Wireweed	Medicinal
147	*SidacordataBurm*.f.	Malvaceae	Herb	Gayapaku	Medicinal
148	*Solanumtrilobatum* L.	Solanaceae	Climber	Ucchintha	Medicinal
149	*Spermacoceneohispida*	Rubiaceae	Herb	Madhanaku	Medic inal
150	*Strychnosnuxvomica* L.	Loganiaceae	Tree	Musti	Medicinal
151	*Strychnospotatorum* L.f.	Loganiaceae	Tree	Chilla	Medicinal
152	*Tamarindusindica* L.	Caesalpiniaceae	Tree	Chintha	Vegetable, Medicinal
153					
154	*Tephrosiapurpurea* (L.)	Fabaceae	Herb	Vempali	Medicinal
155	*Tephrosiavillosa* (L.)	Fabaceae	Herb	Nuguvempali	Medicinal
156	*Terminaliachebula* Retz.	Combretaceae	Tree	Karaka	Medicinal
157	*Terminaliaarjuna* (Roxb.ex	Combretaceae	Tree	Akumaddhi	Timber
158	*Terminaliabellirica* (Gaertn.)	combretaceae	Tree	Thandra	Timber
159	*Tridax Procumbens* L.	Asteraceae	Herb	Gaddichamanthi	Medicinal
160	*Triumfettarhomboidea* Jacq.	Tiliaceae	Shrub	chinese bur	Weed
161	*Vernoniacinerea* (L.)	Asteraceae	Herb	Garitakamma	Medicinal
162	*Vitexaltissima* L.f.	Verbenaceae	Tree	Nemaliadugu	Timber
163	*Vitexnegundo* L.	Verbenaceae	Shrub	vavili	Medicinal
164	*Waltheriaindica* L.	Malvaceae	Herb	Nallabenda	Medicinal
165	*Wrightiatinctoria* R.Br.	Apocynaceae	Tree	Palavareni	Timber
166	*Ziziphusjujuba* Mill.	Rhamnaceae	Shrub	Peddaregu	Firewood
167	*Ziziphusmauritiana* Lam.	Rhamnaceae	Shrub	Regu	Firewood, Edible
168	*Zizipusoenopolia* (L.)	Rhamaceae	Shrub	Pariki	Firewood
169	*Zizipusxylopyrus* (Retz.)	Rhamnaceae	Shrub	Ghotiki	Firewood
170	*Zorniagibbosa* span.	Fabaceae	Herb	Hunnam	weed

Table -2 Different Life forms and their distribution among families

Total Life form	No.of species	No.of genera	No.of family
Trees	56	43	22
Shrubs	41	32	20
Herbs	51	58	23
Climbers	16	16	8
Parasite	1	1	1
	165	150	74

The analysis reveals that the vegetation of Polathala sacred grove is very precious for the economy of locals. Ninety species (i.e 51.5%) are used as timber, firewood, edible, fooder, ornamental and often non timber forest products. *Pterocarpussantalinus* and *Croton scabiosus* are most important endemic species in the Polathala sacred grove.*Pterocarpussantalinus* is famous for its quality timber. But to use these natural resources in a sustainable way should be the main priority of the state government and state forest department Plantation programs and protection of vegetation from fire, grazing and over exploitation in Polathala sacred grove are some of the initiates taken by the forest department to conserve it with the involvement of local people.

Phytosociological analysis:

A total of 465 tree individuals (≥gbh) in 0.01ha. area,.431 shrubs in 0.0025 ha and 1026 herbs in 0.0001h. Area were recorded. Out of These 465 trees, 239 individuals, the distribution of basal area across different gbh classes shows that the gbh class having 10-30 cm gbh (57%),152 are with 31-50cm gbh (36%),24 are with 51-70cm gbh (6%),3 are with 71-90cm gbh(1%) and only 2 are with >90cm gbh (less than 1%) (Fig -2).saplings are below 2m height with 85individuals.The data indicates maximum number of individuals lie between 10-30cm of gbh, 31-50cm lower gbh classes. The population has represented reverse "J" shaped curve indicating a negonerating type of forest occurs in the sacred grove.

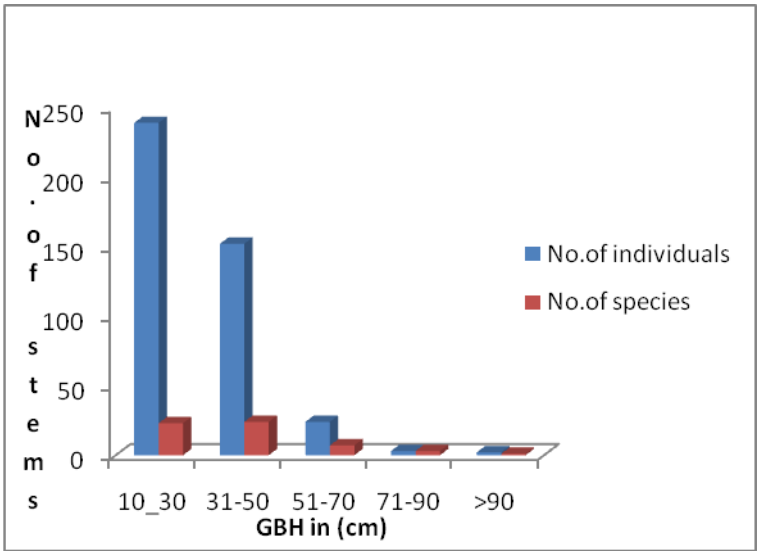


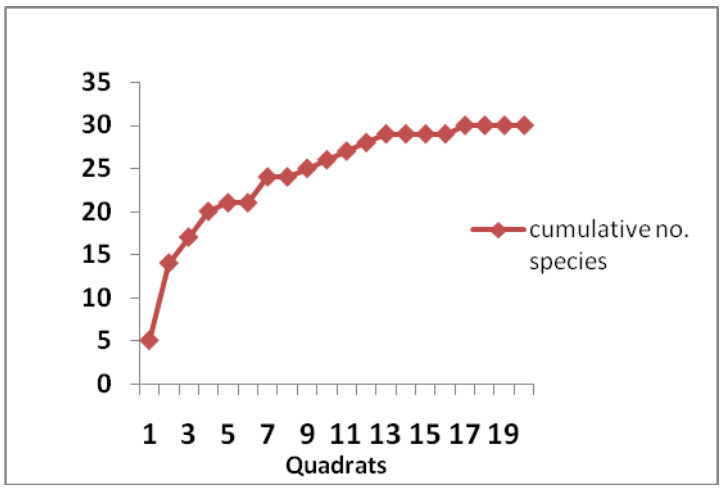
Fig – 2 Gbh Trees

Shannon Index:

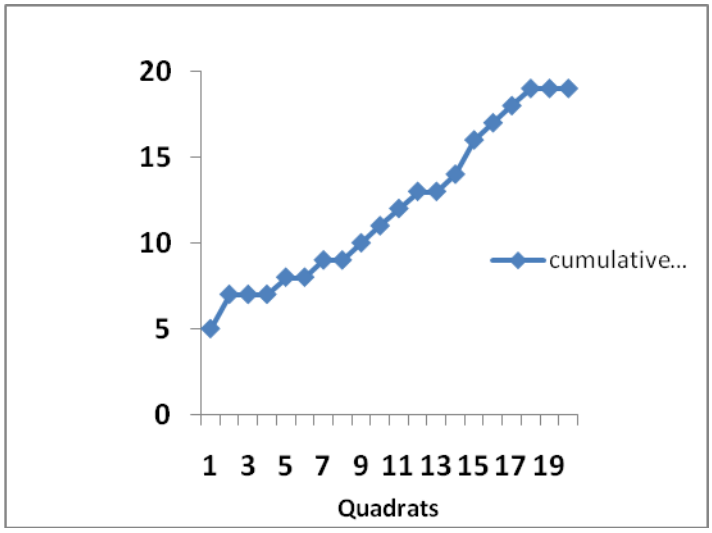
The diversity index Shannon has indicated all the trees formed the most diverse life form with 2.5, followed by shrub with 2.41 and herbs with 2.24 value respectively. The diversity in Indian forests ranged between 0.83 to 4.1 [7, 8,9]. The diversity India of the present study are within the range reported for Indian forests. The Shanon waver index in present study is highest in trees compared to shrubs and herbs. The Shanon - Wiever index value of Indrakiladri hills also ranged from 2.226 to 3.65 which also correlate with other results [10].

Species area curve:

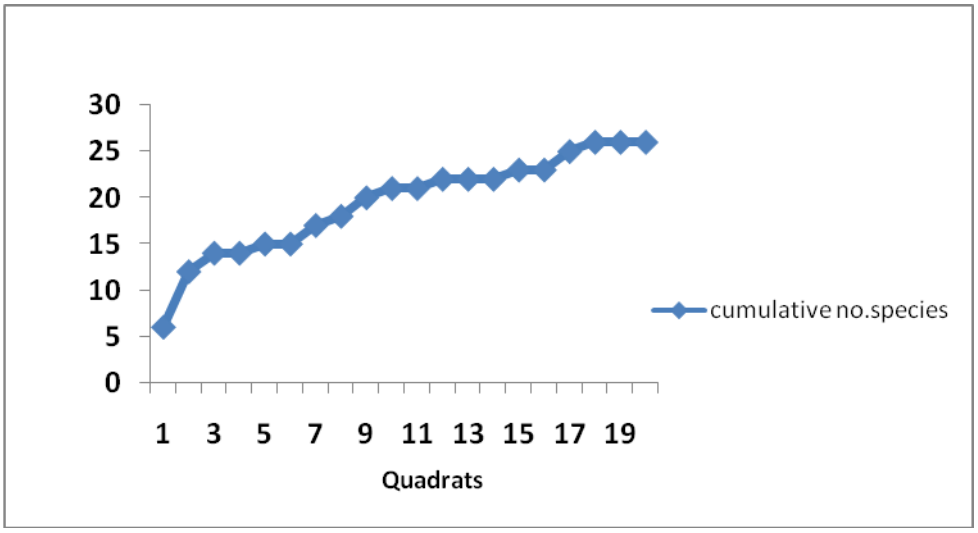
The species area curves (Fig 3, 4, 5) of all the three plant life form got stabilised. The species are curve of herbs got stabilised at 18th quadrat, while the curve of shrubs got plateaued at 18thquadrat.The tree species area curve reached the asymptotie at 17th quadrat. It suggests that the sampling is adequate in recording the plant species.



Fig–3: Tree species area curve



Fig–4: Shrub species area curve



Fig–5: Herb species area curve

IVI (IMPORTANT VALUE INDEX):

A total 465 tree individuals were recorded in the 20quadrats.By analysis according to important value index, *Albiziaamara* was featured the most dominant species (50.22) in the sacred grove, followed by *Croton scabiosus* (44.22) and *Dolichondroneatrovirens* (22.7) were analysed. Albiziaamara showed high Relative basal area (24.84) fallowed by *Wrightiatinctoria* (9.66) and *Tamarindusindica* (9.21). *Alangiumsalvifolium* (0.29) and *Cleistanthuscollinus* (0.31) showed the least values. The value obtained for basal area in the present study is comparable to the Indian tropical forest [9]. *Croton scabiosus* (31.61) have high relative density followed by *Albiziaamara* (12.69) and *Dolichondroneatrovirens* (11.4).

Table-3: Index for Trees.

Tree species	RF	RD	RBA	IVI
Acachu	5.56	5.38	1.56	12.49
Aca nil	1.59	1.08	0.99	3.65
Alasal	0.79	0.22	0.29	1.30
Albama	12.70	12.69	24.84	50.22
Albleb	0.79	0.65	2.26	3.70
Baurac	6.35	3.44	3.29	13.08
Bucaxi	3.97	2.15	1.59	7.71
Casfis	7.94	4.09	7.57	19.60
Chlswi	0.79	0.22	1.10	2.11
Cle col	0.79	0.43	0.31	1.54
Crosca	9.52	31.61	3.09	44.23
Diochl	3.97	3.01	4.15	11.13
Diomel	1.59	3.01	2.29	6.89
Dolatr	7.14	11.40	4.12	22.66
Gar gum	4.76	1.94	1.30	8.00
Givmol	1.59	0.65	1.27	3.51
Gretil	0.79	0.22	0.31	1.32
Har bin	3.97	2.80	4.46	11.22
Pre tom	2.38	0.86	0.31	3.55
Pte san	1.59	1.51	4.62	7.71
Strnux	5.56	3.66	3.30	12.51
Str pot	2.38	1.29	1.94	5.61
Tam ind	0.79	0.43	9.21	10.43
Terche	1.59	0.43	4.55	6.57
Terarj	0.79	0.22	0.42	1.43
Vit alt	1.59	0.86	0.65	3.10
Wri tin	5.56	3.66	9.66	18.87
Ata mon	3.17	2.15	1.29	6.61
	100.00	100.00	100	300

RF=Relative Frequency, RD = Relative Density, RB= Relative Basal Area, IVI= Important Value Index.

Among the 431 shrub individuals being reported from the 20 quadrats. The IVI value indicated that *Dodonaeaviscosa* the most dominant shrub species (51.3) followed by *Catunaregumspinosa* (37.0) and *Securinegaleucopyrus* (36.5). *Dodoniaviscosa* showed high Relative density (26.45) followed by *Catunaregumspinosa* (14.85) and *Securinegaleucopyrus* (13.69).

Among the total 1026 herb individuals were reported from the 20quadrats. Sidaaccuta represented the dominant herb species (75.14) followed by *Cymbopogancoloratus* (23.05) and *Evolvulusalsinoides* (22.8). *Sidaacuta* showed high Relative density (43.47) followed by *Cymbopogancoloratus* (8.87) and *Tephrusiapurpuria* (6.04).

DISCUSSION:

Tree density and diversity for the different sacred groves from Eastern Ghats

S.No	Site	Total/No of Tree species	Area/ha	Density
1	Sadasivakona	55	35	975
2	Singirikona	46	30	937
3	Kailasakona	42	25	929
4	Bupathayyakona	47	25	1018
5	Talakona	66	50	999
6	Piranmalai Forest	16	0.1	620
7	Gundlabrahmeswarm	124	0.25	61.97
8	Polathala	465	0.01	100

Kunstellariakeralensis, a climbing legume reported from a sacred grove in Southern Kerala, is a new genus record for India and a new species altogether [11] *Blepharistemmamembranifolia, Buchananialanceolata,* and *Syzigiumtravencoricum* are rare species found only in the sacred groves of Kerala [12].

CONCLUSION

The study reveals that the sacred grove preserves a number of floristic elements. There are 175 species belonging to 138 genera under the 49 families. The area is blessed with rich vegetation, endemic plants and potential medicinal plants. It is also said that Polathala sacred grove forest has good potential of medicinal plants. Natural populations are under serious threat from over exploitation, constant grazing and extraction of fuel wood, collection of medicinal plants and non-timber forest products cause the degradation of various rare and threatened plants. This information can be used in future planning of sustainable utilization and also in extension activities of temple area. Therefore, it is important to take appropriate measures and protect such ecologically important groves. There is an urgent need to preserve and acknowledge the efforts of the local people of this area in preserving the other sacred patches of forests and conservation of their valuable biodiversity and cultural diversity. The stake holders of the grove may be provided substantial incentives for the same.

REFERNCES

[1] Gadgil, M and V.D.Vartak 1975. Sacred groves of India: A Plea for continued conservation. Journal of the Bombay Natural History Society 72:314 -320.

[2] Shaff.T 1988. Sacred Groves in Ghana: Experiences from an integrated study Project, UNESCO and Oxford – IBH Publishing, NEW DELHI 145-150.

[3] DevarajP, Ramanujam MP, Ganesan T.2005. Status report of sacred groves of Pondicherry Region and strategies for conservations, Institute of Forest Genetics and Tree Breeding Coimbatore,India.16-21.

[4] Jain S.K.and Rao.R.R 1977, A Hand book of field and herbarium methods (Today and Tomorrow's printers and publishers, New Delhi, Calcutta).

[5] Pullaiah.T 1997. *Flora of Andhra Pradesh,* India (scientific publishers, Jodhpur, India).

[6] Misra.R 1968. Ecology workbook (Oxford and IBH publishing co.pvt. ltd. New Delhi)

[7] NV Parhasarathy, Kinbal and L.P.Kumar, Plant species diversity and human impact in the tropical wet evergreen forests of Southern Western Ghats,Indo –French Workshop on tropical forest ecosystem:November,1992. Natural Functioning and Anthropogenic impact, French Institute, Pondichery.

[8] JS Singh, Rawat and O.P.Chaturvedi, 1984. Replacement of Oak forest with pine in the Himalaya affect the nitrogen cycle,Nature,311, 54 -56.

[9] Visalakshi N., 1995. Vegetation analysis of two tropical dry evergreen forest in Southern India, Tropiccal Ecology, 36, 117-127.

[10] Venkatesh Ramilla, Khasim, S.Mahammad and Babu Kakumanu 2015. Floristic diversity and Phyto – sociological studies of IndraKiladri Sacred Grove in Krishna district, Andhra Pradesh, India.(IOSR – Journal of Pharmacy and Biological Sciences Volume -10, Issue 4 Ver –I(Jul –Aug.2015). PP 61-75.

[11] Mohan, CN and Nair , N.C.1981. Kunstteria Prain – a new genus record for india and new species in the genus proceedings of the Indian Academy Sciences B-90:207 -210.

[12] Nair, N.C and Mohan, CN.1981. On the rediscovery of four threatened species from the Sacred groves of Kerala Journal Econ Tax Botr 2: 233 -235.

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