INTERNATIONAL JOURNAL OF ENVIRONMENT
Volume-4, Issue-2, March-May 2015 ISSN 2091-2854
Received:14 April *Revised:10 May* *Accepted:24 May*

PHYTODIVERSITY AND CONSERVATION OF NITHYPOOJA KONA SACRED GROVE OF NALLAMALA HILL RANGE, EASTERN GHATS, ANDHRA PRADESH

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Abstract

Sacred groves are climax forests and are the only representatives of natural or near-natural vegetation. These are dedicated to deities or ancestral spirits worshipped by local tribes along with surrounding plants and trees. These are ecosystems by themselves and perform all the ecological functions. Phytodiversity constitute a large segment of the flora which provides raw materials for use by numerous Pharmaceutical industries. The present study will be useful for researchers in the field of Ethan botany, Ethnomedicine, Taxonomy, and Pharmacology for further studies. Nithyapoojakona Sacred grove is one of the important sacred groves in Kadapa district. The present paper deals with the phyto-diversity of the above grove used by local tribes. This paper deals with the 181 species of probable medicinal potential belonging to 138 genera and 71 families. Significant flora are *Cycas beddomei*, *Pterocarpus santalinus*, *Drosera burmaptonni*, *Orabanche cernua*, *Neptunia oleracea*, *Hugonia mystax*, *Caralluma adsendens* , *Gloriosa superba*, *Limnophila spp*, *Centella sasiatica* etc. Word famous Red sanders population of the study area is being destroyed unethically and it is to be protected.

Key Words: Sacred Grove , Deities , Tribes, Nithyapoojakona, phytodiversity

Introduction

Sacred groves (SGs) are small groves that vary in size from a few hectares to a few kilometers and protected by local communities as being the sacred residences of local deities and sites for religiocultural rituals. They serve as valuable storehouses of biodiversity. They are part of Biological heritages and systems that has helped to preserve the representative genetic resources existing in the surrounding regions for generations. Sacred groves are the important places in which biodiversity is preserved in mostly undisturbed condition because of certain taboos and religious beliefs. They are ancient natural sanctuaries that have supported the growth of several interesting and rare species of flora and fauna (Bartle, 1997). The sacred groves harbor genotypes of future importance that may be very vital for breeding programs. The institution of sacred groves dates back to the pre-agrarian hunting-gathering phase of human civilization, and is known to thrive in most parts of India (Kosambi, 1962).

Plants have tremendous potential to become renewable sources of high quality raw materials for industry as well as providing a wealth of genetic diversity which can be lead to the discovery of new things (Bartle, 1997).The state of Andhra Pradesh has 800 Sacred groves eneumerated so far (Bhandary and Chandrasekhar, 2003) locally known as Pavithra-vanalu. According to "WWF-AP", 1996 76 groves were identified Kadapa district.. The strands in the Sacred groves were more diverse, had high basal area and showed fewer signs of disturbances than the Natural forest land. This supports the view that local communities afford better protection and management to Sacred groves (Ravi Prasad Rao, 1998). Biodiversity of Sacred groves is preserved in mostly undisturbed condition probably due to certain taboos and religious beliefs (Lakshmi Narayana and Venkaiah, 1998).Ethno botanical wealth of sriharikota Island of Nellore studied and reported 18 plant species of high medicinal importance (Savithramma and Basha, 2002). This scenario motivates use to explore the medicinal Flora of Penchalakona Sacred grove which is studied by Basha et al. (2012) the second largest of the district after Narasimha Konda Sacred grove. Yanadis, yerukalas tribes living in this sacred grove. It is precariously protected by the tribal population of the grove. Recently Sacred Grove of Punyagiri Hills, Vijayanaram District

studied by Srinivasa Rao and Narasimha Rao 2014 emphasised the medicinal phytodiversity of Sacrde groves.

Topography

Nithyapoojakona (Fig 1) is one of the scared Grooves located in the southern part of Lankamalleswara wild life sanctuary of Eastern Ghats 33 Km from Kadapa. It lies between 14.32'2''N -78.56'39 E. It is a grove of the temple of Lord Shiva. To reach the temple everyone has to trek the trail up to 2.5kms form Panchalinga. The trail is formed with huge rocks and with some water deposited and plenty of trees on the both sides of the trail you cannot able to catch the sky with your eye at some places either you can see hill or green leaves only. Particularly saying, Nithyapoojakona waterfalls cascading down a height of 100feet.The water flows through the trail also and in rainy seasons you can experience walking on water. There is no written history about this groove but the tale is just like Tirumala. Lord Shiva came to earth and residing at Nithyapoojakona. Every day one cow used to give milk to Shiva. It was observed by the owner of the cow and he beats the Siva later he realizes and became devotee 1000 trees were seen in the grove.181 species of flora were reported to exist once. Significant flora are *Cycas beddomei*, *Pterocarpus santalinus,Drosera burmaptonni* ,*Orabanche cernua*, *Neptunia oleracea*, *Hugonia mystax, Caralluma adsendens* , *Gloriosa superba*, *Limnophila spp*, *Centella sasiatica* etc. many wild animals ,monkeys , Jackals ,birds, bats, antelopes, cats, hares, boars, porcupine, reptiles like tortoise, varanus, scorpion, centipedes, millipedes, wild bees and butterflies were reported.

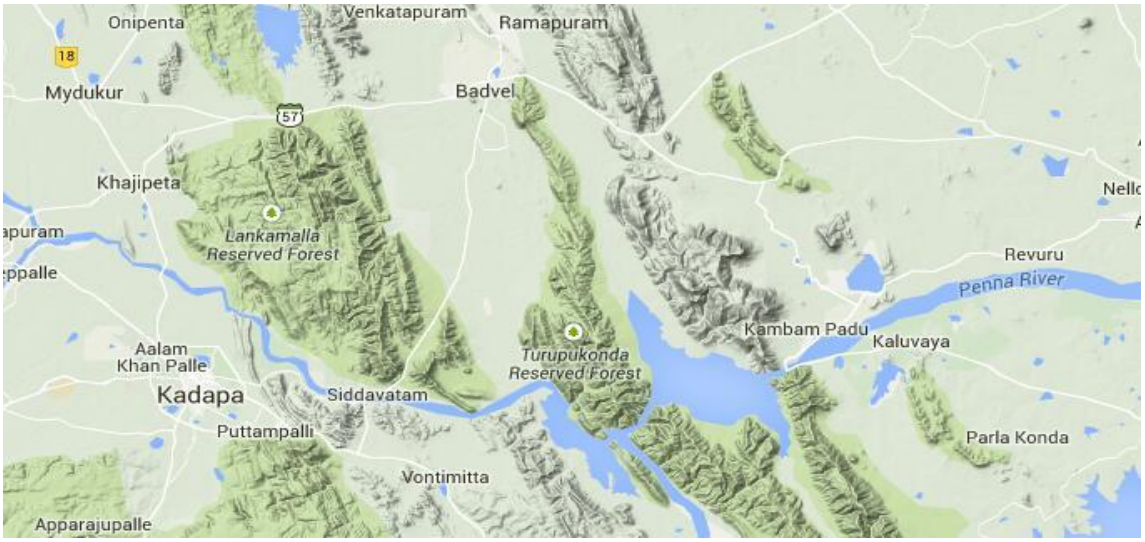

Figure: 1: Location of Nityapoojakona of Lankamalleswaram Wild life Sanctuary, Eastern Ghats

Materials and methods

The study was carried out during July 2013 – March 2014. Plant specimens were collected and identified after studying all characters with the help of standard local flora and the relevant literature available on the internet (www.Googlescholar) the indigenous knowledge of local primitive communities like Yanadies, Yerukula and Loddy etc. The indigenous knowledge of these primitive communities through personal interviews is utilized in the identification of the key flora of the study area. Herbarium was prepared by the standard methods. The entire area of the sacred grove is thoroughly studied by repeated visits in different seasons of the year 2013–2014 covering pre-monsoon, monsoon and post-monsoon seasons. It helps in observing the different developmental stages of medicinal plant species like vegetative, flowering and fruiting stages. The plant specimens were collected, identified with the help of Flora of Presidency of Madras Gamble, 1967 and Genera Platarum of Bentham and Hooker 1897. During the field work, the specimens collected for the preparation of herbarium were processed in accordance with the methodology adopted by Jain and Rao 1977. The plant species are given in alphabetical sequence with other details such as botanical name, vernacular name, family, habit in Table I.

Identification of plants

The plant species were collected from the forest with the help of practitioners and identified using the Gamble, J.S. 1915-36. Flora of Presidency of Madras, and local floras as well as through comparison with identified specimens deposited in the herbarium of Nedurumalli Bala Krishna Reddy medicinal plant research center Department of Botany Vidyanagar**.**

TABLE: 1 LIST OF PLANTS IN NITHYAPOOJAKONA SACRED GROOVE

S.No	Botanical Name	Vernacular name	Family	Habit
1	*Abuliton indicum* (L.)Sweet.Hort.Brit.	Duvvenakaya/ Tutturubenda	Malvaceae	Shrub
2	*Abrus precatorius* L.	Guriginga	Faboideae	Climber
3	*Acacia leucophloea* (Roxb.) Willd.	Tella tumma	Mimosaceae	Tree
4	*Achyranthes aspera* L.	Uttareni	Amaranthaceae	Herb
5	*Actinopteris radiata* (Koenig ex Sw.)	Mayuri shika	Actinopteridaceae	Herb
6	*Adiantum caudatum* L.	Raja hamsa	Adiantaceae	Herb
7	*Aegle marmelos* (L.)	Maredu / Bilva	Rutaceae	Shurb
8	*Aerva lantana* (L.)	Pindikura	Amaranthaceae	Herb
9	*Ageratum conyzoides* L.	Goat weed	Asteraceae	Herb
10	*Alangium salvifollium (*L.f.)	Udaga / Ankolamu	Alangiaceae	Tree
11	*Albizia amara* (Roxb.)	Cheekireni	Mimosaceae	Tree
12	*Albizzia odoratissima (*L.f.) Benth	Chinduga	Mimosaceae	Tree
13	*Alstonia scholaris* L.	Edakulapala	Apocynaceae	Climber
14	*Andrographis paniculata* (Burm.f.) Wall.	Nelavemu	Acanthaceae	Herb
15	*Anisomelea malabarica* (L.)	Moga-Bira	Lamiaceae	Shrub
16	*Anogeissus latifolia* (Roxb.ex Dc.)	Chirimanu / Elama	Combretaceae	Tree
17	*Argemeone Mexicana.* L.	Kusuma / Brahmadandi	Pepepaveraceae	Herb
18	*Aristolochia braceteolata* Lam.	Gadidagadapa	Aristolochiaceae	Herb
19	*Aristolochia indica* L.	Easwari	Aristolochiaceae	Herb
20	*Atalantia monophylla* (L.)	Munukudu	Rutaceae	Shrub
21	*Azadirachta indica* A.Juss. In Mem.Mus.Natl.	Vepa	Meliaceae	Tree
22	*Azima tetracantha* Lam.	Tella uppili	Salvadoraceae	Shrub
23	*Bacopa monnieri* (L.) Pennel	Brahmi	Scrophulriaceae	Herb
24	*Bauhinia racemosa* Lam.	Are fibres	Caesalpinaceae	Tree
25	*Boerhavia diffusa* L.	Attamamidi	Nyctaginaceae	Herb
26	*Boswelia serrata* Roxb.	Sambrani	Burseraceae	Tree
27	*Boswellia ovalifoliata*	Kondasambrani	Burseraceae	Tree
28	*Buchanania Lanzan* Spr	Sara	Anacardiaceae	Tree
29	*Caesalpinia bonduc* (L.)Roxb.	Gachakaya	Caesalpinioideae	Straggler
30	*Calotropis gigantia(*L)	Tellagilledu	Asclepiadaceae	Shrub
31	*Calotropis procera*(Aiton)	Gilledu	Asclepiadaceae	Shrub
32	*Capparis sepiaria* L.	Nalla uppili	Capparaceae	Shrub
33	*Cardiospermum halicacabum.* L.Sp.	Buddakakara	Sapindaceae	Climber

34	*Careya arborea Roxb.*	Budda darimi	Barringtoniaceae	Tree
35	*Carmona retusa* (Vahl)	Nomuchettu / Barranki	Boraginaceae	Shrub
36	*Cassia absus* L.Sp.	Chanupala vittulu	Caesalpinaceae	Herb
37	*Cassia fistula* L.Sp.	Rela	Caesalpinaceae	Tree
38	*Cassia italica* (Mill.)Spreng.	Nelatangedu	Caesalpinaceae	Herb
39	*Cassia montana* Meyne ex.Roth.	Pyditangedu	Caesalpinaceae	shrub
40	*Cassia alatab* L.	Seema Avisa	Caesalpinaceae	Shru
41	*Cassia occidentalis* L.Sp.	Kasintha	Caesalpinaceae	shrub
42	*Cassytha filiformis* L.	Sitamma savaralu	Lauraceae	Climber
43	*Catunaregam spinosa* (Thung.)	Manga	Rubiaceae	Shrub
44	*Cayratia pedata* (Lam.)	Adavi gummaditeega	Vitaceae	Climber
45	*Caeba pentandra* (L.)Gaertn.	Tellaburuga	Bombaceae	Tree
46	*Centella asiatica* (L.)	Saraswathi	Apiaceae	Herb
47	*Chionanthus zeylanica* L.Sp.	Punagani	Oleaceae	Tree
48	*Chloroxylon swietenia* DC.Prodr.	Billudu	Meliaceae	Tree
49	*Christella dentata* (Forssk.)	Downy wood fern	Thelipteridaceae	Herb
50	*Cipadessa baccefera* (Roth)Miq. In Ann.Mus	Ranaberi	Meliaceae	Shrub
51	*Cissampelos pareira* L.Var.hirsuta	Visha boddi	Menispermaceae	Shrub
52	*Cissus quadrangularis* L.	Nalleru	Vitaceae	Herb
53	*Cissus vetigenia* L.Sp.Pl.	Adavi gummidi	Vitaceae	Climber
54	*Cleistanthus collinus*	Kodisa	Euphorbiaceae	Tree
55	*Cocculus hirsutus* (L.) Diels in Engl.	Dusari Teega	Menispermaceae	Climber
56	*Cochlospermum religiosum* (L.) *Alston*	Konda gogu	Cochlospermaceae	Tree
57	*Coldenia procumbens* L.	Hamsapadu	Boraginaceae	Herb
58	*Corallocarpus epigaeus* (Rott.)	Mukkudonda	Cucurbitaceae	Climber
59	*Cordia dichotoma* Forst.f	Bankamanu / Nakkera	Boraginaceae	Tree
60	*Costus speciosus* (Koen.)	Adavi allam/ Chengalva cost	Costaceae	Herb
61	*Crateva religiosa* G.Forst	Varuna(Spider tree)	Capparaceae	Tree
62	*Curculigo orchioides* Gaertn.,Fruct.	Nelathati	Hypoxidaceae	Herb
63	*Cucumis prophetarum* L.	Mullapapara	Cucubitaceae	Climbi ngperinial herb
64	*Cymopogon flexuosus*(L.) Rendle	Nimma gaddi	Poaceae	Herb
65	*Cycas beddomei*	Konda eatha	Cycadaceae	
65	*Dalbergia latifolia* Rcoxb.	Jittagi / Iridi	Fabaceae	Tree
66	*Dalbergia paniculata* Roxb.Pl.Cor.t.	Pacchari	Fabaceae	Tree
67	*Datura metal* L.	Nalla ummetta	Solanaceae	Herb
68	*Datura stromonium* L.	Ummetta	Solanaceae	Shrub

69	*Decalepis hamiltonii* Wight &Arn	Maredu kommulu	Asclepediaceae	Shrub
70	*Decaschistia crotonifolia* Wight &Arn	Adavigogu	Malvaceae	Shrub
71	*Deccannia pubscens* (Roth)	Konda manga	Rubiaceae	Tree
72	*Derris scandens* (Roxb.)	Nalla teega	Fabaceae	Climber
73	*Desmdium triflorum* (L.) Dc.	Munta mandu	Fabaceae	Herb
74	*Dillenia pentagyna roxb.*	Chinna kalinga	Dilleniaceae	Tree
75	*Diospyros ebenum* Koen.	Nalla uti	Ebenaceae	Tree
76	*Dodonea viscosa* (L.)Jacq.Enum.	Bandaru	Sapindaceae	Shrub
77	*Eclipta prostrata* (L.)	Gunta galijeru	Asteraceae	Herb
78	*Ehretia pubescens Benth.in Royle.*	Pakki	Boraginaceae	Tree
79	*Enicostema axillare* (Lam.)	Gulividi	Gentianaceae	Herb
80	*Entada pursaetha* DC.	Gila teega / Konda chinta	Mimosaceae	Climber
81	*Euphorbia hirta* L.	Nanabala	Euphorbiaceae	Herb
82	*Ficus benghalensis* L.Sp.	Marri	Moraceae	Tree
83	*Ficus hispidal*.f.	Bramha medi	Moraceae	Small tree
84	*Gardenia Latifolia* Aie	Peddabikki	Rubiaceae	Tree
85	*Gardenia resinifera* Roth.	Erribikki	Rubiaceae	Tree
86	*Givotia moluccana*(L.)	Tella poliki	Euphorbiaceae	Tree
87	*Gloriosa superba* L.Sp.Pi.	Nabhi / Nagetigadda	Liliaceae	Climber
88	*Glycosmis pentaphylla* (Retz) DC.	Gonji	Rutaceae	Shrub
89	*Gymnema sylvestre* (Retz)	Podapatri	Asclepediaceae	Shrub
90	*Gyrocarpus asiaticus* Willd.	Taniki /Nalla poliki	Hernandiaceae	Tree
91	*Habenaria apetala*		Orchidaceae	Herb
92	*Hebanaria roxburghii Nicolson*	Malleleena gadda	Orchidaceae	Herb
93	*Haldinia cordifolia* (Roxb)	Rudra ganapa	Rubiaceae	Tree
94	*Hardwickia binata* Roxb	Yepi	caesalpiniaceae	Tree
95	*Hedtitus peberula* (G.Dorn)Arn.	Chiruveru	Rubiaceae	Herb
96	*Hedyotis corymbosa* (L.)	Vermela – vemu	Rubiaceae	Herb
97	*Hedyotis herbacea* L.	Chiriveru	Rubiaceae	Herb
98	*Helicters isora* L.	Gooba thada	Sterculiaceae	Shrub
99	*Hemidesmus indicus*(L.) var.inducus	Sugandhapala	Periplocaceae	Herb
100	*Hemionitis arifolia* (Burm.f.) Moore	Rama bhanam	Hemionitidaceae	Herb
101	*Hiptage benghalensis* (L.)Kurz	Madhavi tega	Malphigiaceae	Climber
102	*Holarrhena antidysenterica* (Roxb. exFleming)	Kola musthi / pala / kodisapala	Apocynaceae	Tree
103	*Holostemma ada-kodein Schultes*	Tella jilledu / Peyyi baddu	Asclepediaceae	Climber
104	*Hybanthus enneaspermus* (L.) *Muell.Arg.Fragm.*	Ratna purusha	Violaceae	Herb
105	*Ichnocarpus frutescens* (L.)R.Br.	Palateega	Apocynaceae	Climber

106	*Impatines leschenaulti* (DC.)Wall.ex.Wight & Arn		Balsaminaceae	Herb
107	*Ixora pavetta* Andr.Bot.Repos.t.	Korivi/ Papidi	Rubiaceae	Tree
108	*Jasminum auriculatum* Vahl.	Adavimalli	Oleaceae	Climber
109	*Justicia adhatoda* L.	Addasaram	Acanthaceae	Shrub
110	*Lannnia coromandalica* Houtt Mann	Gumpena	Anacardiaceae	Tree
111	*Lagerstrumia parviflora* Roxb	Chennangi	Lythraceae	Tree
112	*Lantana camara* L.	Phallikampa	Verbanaceae	shrub
113	*Leonotis nepetiifolia* (L)R.Br.Prodr	Ranabheri	Lamiaceae	Herb
114	*Lepisanthes tetraphylla* (Wall.) Radf.	Sali kunkudu	Sapindaceae	Tree
115	*Limnophila indica* (L.)	Sambrani	Scrophulriaceae	Herb
116	*Lygodium flexuosum* (Linn.)	Mekasannu	Schizaeaceae	Climber
117	*Madhuca longifolia* (Koen.)Macbr.	Ippa	Sapotaceae	Tree
118	*Martenea annua* L.	Telukondikaya	Pedaliaceae	Shrub
119	*Manikara hexandra* (Roxb.)	Pala	Sapotaceae	Tree
120	*Momordica charantia L.Var.muricata* Willd	Buddakakara	Cucurbitaceae	Climber
121	*Morinda tinctoria* Roxb	Togaru	Rubiaceae	Tree
122	*Moringa concanensis*	Adavi munaga	Moringaceae	Tree
123	*Nelumbo nucefera*	Tamara	Nelumbonaceae	
124	*Ochna obtusata* DC.	Errijambi	Ochnaceae	shrub
125	*Olax scandens* Roxb.	Mekabanda	Olacaceae	Climber
126	*Opilia amentacea* Roxb.	Nallamekabanda	Opilaceae	Climber
127	*Oroxylum indicum*.L	Dundilam	Bignoniaceae	Tree
128	*Pavonia xylanica* (L.)Cav.	Adavi puttudu / Chiru benda	Malvaceae	Herb
129	*Pedalium murex* L.	Enugupalleru	Pedaliaceae	Herb
130	*Phyllanthus amarus* Schum&Thonn	Nelausiri	Euphorbiaceae	Herb
131	*Phyllanthus embllica* L.	Nelli / Usiri	Euphorbiaceae	Tree
132	*Physalis minima* L.	Budama	Solanaceae	Herb
133	*Piper sylevestre*	Toka mereyalu	Piperaceae	Climber
134	*Plumbago zylanica*	Tella chitramulam	Plumbaginaceae	Herb
135	*Pouzolzia zeylanica* (L.)Benn.	Uchchagadda	Urticaceae	Herb
136	*Premna tomentosa* Willd	Narava/ Namari	Verbanaceae	Tree
137	*Pterocarpus marsupium* roxb.	Yegisa	Fabaceae	Tree
138	*Pterocarpus santalilnus* L.F.	Rakta chandanam	Fabaceae	Tree
139	*Pterospermum xylocarpum* (Gaertn.)	Tada	Sterculiaceae	Tree
140	*Pueraria tuburosea* Roxb.exWilld.	Chenchu gadda / Bhoochakra	Fabaceae	Climber
141	*Rubia cordifolia*	Mangista	Rubiaceae	Shrub
142	*Salvadora persica* L.	Nalla uppili/ Varagogu	Salvadoraceae	Tree

143	*Santalum album*L.	Chandanam , Srigandham	Santalaceae	Tree
144	*Schefflera stellata* (Gaertn.) Harms	Reval, Ededdula	Araliaceae	Shrub
145	*Scilla hyacinthina* (Roth)	Nakkeragadda	Liliaceae	Herb
146	*Shorea roxburghii G.Don Gen.Syst*	Jalari	Dipteerocarpaceae	Tree
147	*Solanum Melanogena L.varinsanum* L.	Chiruvanga	Solanaceae	Shrub
148	*Solanum surrattense* Burm.F.	Errivanga	Solanaceae	Tree
149	*Solanum trilobatum* L.	Mulla mushti	Solanaceae	Climber
150	*Soymida febrifuga* (Roxb)	Somi	Meliaceae	Tree
151	*Sphaeranthus indicus* L.	Bodasaram	Asteraceae	Herb
152	*Strychnos nux-vomica*L.f.	Musthi	Loganiaceae	Tree
153	*Strychnos potatorum* L.F.Suppl.	Chilla	Loganiaceae	Tree
154	*Suregada angustifolia* (Baill.ex Muell.Arg)	Sapranchi	Euphorbiaceae	Shrub
155	*Syzygium cumini* (L.)	Neredu	Myrtaceae	Tree
156	*Tarenna asiatica* L.	Kommi	Rubiaceae	Shrub
157	*Terminalia arjuna* (DC.) Wight&Arn)	Arjuna / Tella maddi	Combretaceae	Tree
158	*Terminalia alata*	Nallamaddi	Combretaceae	Tree
159	*Terminalia bellirica* (Gaertn.)	Thandra / tani	Combretaceae	Tree
160	*Terminallia chebula* Retz.	Karaka	Combretaceae	Tree
161	*Terminalia pallida Brandis*	Tellakaraka	Combretaceae	Tree
162	*Tinospora cordifolia* (Willd.)Hook.f. &Thoms	Tippa teega	Menispermaceae	Climber
163	*Toddalia asiatica*.L		Rutaceae	Straggler
164	*Tribulus terrestris* L.	Palleru	Zygophyllaceae	Herb
165	*Trichosanthes tricuspidata* Lour.	Papara	Cucurbitaceae	Climber
166	*Tridax procumbens* L.	Gaddi chamanthi	Asteraceae	Herb
167	*Tylophora indica* (Burm.f.)	Kakkupala	Asclepediaceae	climber
168	*Vanda spathulata* L.	Nusti bhadhanika	Orchidaceae	Herb
169	*Vanda roxburghii* (Nicolson in Salda)	Veduru bhadhanika	Orchidaceae	Herb
170	*Vanda tessellata*(Roxb.)	Kodikallachettu	Orchidaceae	Herb
171	*Ventilagoo denticulata* Willd.	Surati / Surudu	Rhamnaceae	Climber
172	*Vernonia anthelmintica* (L.)	Adavi jeelakarra	Asteraceae	Herb
173	*Vettiveria zizanioides* (L.)	Vattiveru	Poaceae	Herb
174	*Viscum articulatum* Burm.f.	Badanika	Viscaceae	Shrub
175	*Vitex altissima* L.f.syppl.	Nemaliadugu	Verbanaceae	Tree
176	*Vitex negundo.*L	Nallavavili	Verbanaceae	Shrub
177	*Walsura trifolia* (A.Juss)	Valudu	Meliaceae	Tree
178	*Wattakaka volubilis* (L.f.)	Kallisi	Asclepediaceae	Climber
179	*Wrightia tinctoria* (Roxb.)R.Br.	Reppala	Apocynaceae	Tree

180	*Ziziphus mauritiana* Lam.Encycl.	Regu	Rhamnaceae	Tree
181	*Ziziphus xylopyrus* (Retz.)	Gotti	Rhamnaceae	Tree

List of Threatened, Endangered and Vulnerable, Endemic medicinal plants of Nithyapoojakona Kona sacred grove

TABLE: 2 LIST OF THREATENED SPECIES IN NITHYAPOOJAKONA SACRED GROOVE

S. No	THREATENED SPECIES
1	*Cochlospermum releligiosum*
2	*Pavonia somifera*
3	*Tylophora indica*
4	*Plumbago indica*
5	*Purenia tuberose*
6	*Strychnos potatorum*

TABLE: 3 LIST OF ENDANGERED SPECIES IN NITHYAPOOJAKONA SACRED GROOVE

S.No	ENDANGERED SPECIES
1	*Cristella dentate*
2	*Lygodium flexuosum*
3	*Costus speciosus*
4	*Decalpis hamilionii*
5	*Vanda spathulata*
6	*Gloriosa superb*
7	*Hemidesmus indicus*
8	*Hybanths enneaspermus*
9	*Hemionitis arifollila*
10	*Glycosmis pentaphylla*
11	*Moringa concanensis*
12	*Strychnos nux-vomica*
13	*Vernonia anthelmintica*
14	*Piper sylevestre*
15	*Vanda roxburghii*

TABLE: 4 - LIST OF VULNERABLE SPECIES IN NITHYAPOOJAKONA SACRED GROOVE

S. No	VULNERABLE SPECIES
1	*Alstonia scholaris*
2	*Centella asiatica*
3	*Corallocarpus epigaeus*
4	*Schefflera stellata*
5	*Careya arborea*
6	*Cucumeria aliangium*
7	*Entada pursaetha*
8	*Dalbergia latifolia*
9	*Dellenia pentagyna roxb*
10.	*Cardiospermum helicabum*
11	*Habenaria apetala*
12	*Maeruva oblongifolia*
13	*Holostemma ada-kodein*
14	*Madhuca langifollia*
15	*Pterocarpus marsupirm rox*
16	*Soymida febrifuga*
17	*Gymnema sylvestre*
18	*Rubia cordifolia*

TABLE: 5 LIST OF ENDEMIC SPECIES IN NITHYAPOOJAKONA SACRED GROOVE

S.No	ENDEMIC SPECIES
1	*Boswvellia ovalifoliata*
2	*Pterocarpus santalinus*
3	*Shorea thumbagaiah*
4	*Terminalia pallid*
5	*Syzygium alternifolium*

Results and discussion

Table: 1 shows the plant species present in the sacred groove region. Table: 2 shows the 6 Threaded species, Table: 3 Shows the 15 endangered species, Table: 4 shows the 18 Vulnerable species and Table: 5 shows the 5 endemic species of medicinal plants of Sacred groove region. Figure: 6 show the comparative analysis of Numerical taxonomy of the

Sacred Groove and Figure: 7 show the comparative analysis of Endangered and Endemic medicinal plant species of Sacred groove.

Figure: 2 *Syzygium alternifolium* is a medicinal plant where the powder of the seeds is used to cure diabetes. Figure: 3 *Pterocarpus santalinus* is a valuable wood yielding medicinal plant specifically grows in this groove has been eradicated illegally. The Government of Andhra Pradesh should take necessary action to protect this natural resource through proper conservative methods. Figure: 4 *Terminalia pallida* is a medicinal plant where the seeds of the plant are used by the tribal people to cure cough. Figure: 5 *Gloriosa superba* L is a medicinal plant where the tubers are extensively used to cure Rheumatic pains and leaf paste is used as an ointment.

Total number of medicinal plant species collected in our study from Nithyapoojakona Sacred grove is 181 species of 138 genera belonging to 75 families. Out of 75 families 69 are of angiosperms, 5 are of Pteridophytes and one is the gymnosperm.

FLORAL DIVERSITY IN NITYAPOOJAKONA SACRED GROOVE

Figure: 2. *Syzygium alternifolium* (Wright) Walp. Endemic

Figure: 3. *Pterocarpus santalinus* L. Endemic

Figure: 4. *Terminalia pallida*(Brandis.) Endemic

Figure: 5. *Gloriosa superba* L. Endangered

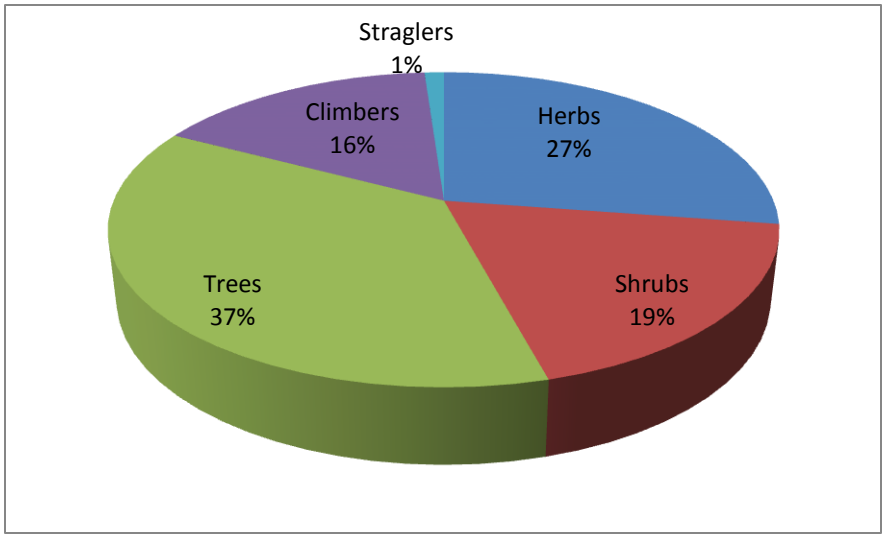

Figure: 6. COMPARITIVE ANALYSIS OF NUMERICAL TAXA

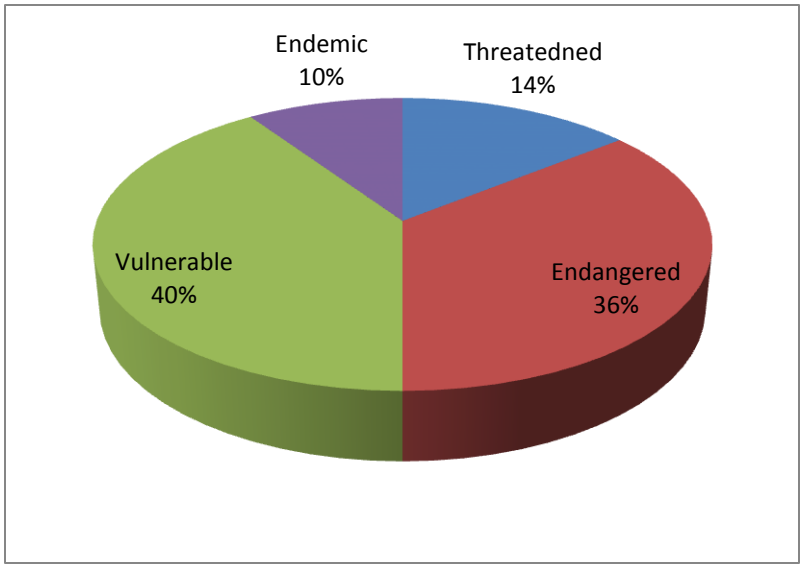

Figure: 7. COMPARITIVE ANALYSIS OF ENDEMIC AND ENDANGERED PLANTS

The medicinal ferns of Pteridophytes of sacred grove are *Adiantum caudatum, Actinopteris radiate, Christella dentate, Hemionitis arifolia* and *Lygodium flexosum*. Cycas beddomi is the only one gymnosperm. There are 49 herbs, 33 shrubs, 66 trees, and 29 climbers. 38% of medicinal plants constitute trees. *Cassia* genus stands first with 6 species. *Terminalia* genus is in second place with 5 species. *Solanum, Hedyotis* genera are in the third place with 3 species. The genera with 2 species are *Albizzia, Aristolochia, Boswelia, Cissus, Dalbergia, Datura, Phyllanthus , Pterocarpus, Shorea, Strychnos, Syzygium Vanda and Ziziphus*.

Rubiaceae is the dominant family with 12 species. It is the dominant family even in Uppa Sacred grove of Eastern Ghats, Visakhapatnam, Andhra Pradesh (Prakash Rao, 2010). Caesalpiniaceae is in second place with 9 species. Fabaceae is in the third place with 8 species. Euphorbiacee, Solanaceae families are fourth in place with 6 species each. Asclepediaceae, Asteraceae, Combretaceae, Meliaceae, Orchidaceae families are fifth in place with 5 species each. Families with 4 species are Boraginaceae, Mimosaceae, Verbanaceae, Cucurbitaceae. Rhamnaceae, Apocynaceae, Menispermaceae, Verbanaceae and Vitaceae, Sapindaceae,Moraceae,Asteraceae,Rutaceae are families with 3 species.2 species from Acanthaceae, Amaranthaceae, Aristalochiaeae, Dipterocarpaceae, Lamiaceae,

Liliaceae, Loganiaceae, Malvaceae, Myrtaceae, Oleaceae, Poaceae, Salvadoraceae, Sapindaceae, Sterculiaceae. The remaining families are with only one species.

60% of the plants of present Sacred groove area are medicinally useful and the others are economically important. Many rare endangered, endemic and threatened plant like *Pterocarpus santalinus, Boswvellia ovalifoliata, Shorea thumbagaiah, Terminalia pallid* are conserved in the sacred groove area. They can use as germplasm collection in their conservation. Micropropagation and tissue culture of the fast disappearing plants of this groove are to be undertaken on a priority basis of conservation.

6 threatened, 15 endangered and 17 vulnerable and 4 Endemic species of the grove are given in above tables.

Conclusion

Phytodiversity constitute a large segment of the flora which provides raw materials for use by numerous Pharmaceutical industries. The present study will be useful for researchers in the field of Ethanobotany, Ethanomedicine, Taxonomy, and Pharmacology for further studies. The tribals and local people who reside near and around the sacred groove still depend on the medicinal flora to cure various ailments. Numerous anthropogenic activities like developmental projects, eco-tourism, modernization, urbanization, overexploitation, over grazing are the major threats for the sacred grove. This recognizes the need to conserve its biological resources. Sacred groves depict cultural, traditional, sociological, biological, economical values and are the chief method of in-situ conservation of biodiversity. Word famous Red sanders population of the study area is being destroyed unethically and it is to be protected.

Acknowledgment

The authors are thankful to all the local people who shared their knowledge on medicinal flora in and around the villages of the sacred grove. We are very much thankful to the district forest Officials of Kadapa.

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