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Floristic composition and ethnomedicinal practices of Iriveri Sree Pulideva Temple, Kannur district, Kerala

Swathi BR, Sincy Joseph

Department of Botany, Nirmala College for Women, Coimbatore, Tamil Nadu, India

Abstract
The present work was carried out on Iriveri Sree Pulideva temple, Kannur District, Kerala. On the basis of investigation about 87 plant species belonging to 46 families are gathered and explained its exact botanical name with family, local name and therapeutical use for number of diseases. Some redlisted species also noted from this grove.

Keywords: iriveri sree pulideva temple, Kannur district

Introduction
All over the world they have been reported many groves from different continents of the world such as Africa, Asia, Europe, Astro-pacific region and America. (Hughes and Chandran, 1998; Malhotra *et al.*, 2007) [9, 20]. In Asia the study of traditional uses has long enjoyed a respected role. About 4215 sacred groves covering an area of 39,036 hectares are estimated to be distributed in India, particularly along the Western Ghats in the state of Maharashtra, Kerala, Karnataka, and Tamil Nadu. In North East India most of the sacred groves has been reported from Arunachal Pradesh, Meghalaya and Manipur (Malhotra *et al.*, 1998) [19]. Several plant species such as Tulsi (*Ocimum sanctum*), Rudraksha (*Eleocarpus sp*.) and Ashoka (*Saraca ashoka*) have been considered sacred. An important tradition of nature worship is to protect patches of forest dedicated to deities or ancestral spirits. These forests patches have been designated as "sacred grove".

In Kerala sacred groves are mainly distributed in plains, numbering about 2000 (Malhotra *et al.*, 2007) [20] of which 578 are in North Malabar (Jayarajan, 2014). Sacred groves form an important unit in the rural landscape of Kerala. Kavus of North Kerala are mainly "Theyya Kavu" belonging to the mother-goddess in many cases. These Kavus are very much associated with Theyyam festivals. These festivals involve dances performed in impressive costumes, headdresses and focuses on ancestor worship, healing and ritual hunt (Jayarajan, 2004). Usually, no one can enter the 'Kavu' during days other than those of worship or during the festival. Cutting trees, collecting fire wood and leaves were strictly forbidden. People believe that any kind of disturbance will invoke wrath of the gods, resulting diseases, natural calamities, failure of crops and even death. Sacred groves also provide habitat, water and nest-sites for wildlife and birds. Several species of honey comb is present in large trees of sacred groves. The groves are associated with ponds, rivers, which help the local peoples to get water in drought periods. The vegetation cover of the sacred groves improves the soil stability of the area and also prevents soil erosion.

Materials and Methods
Study area
The study area Iriveri Sree Pulideva temple covers an area of about 5 acres and located nearly 14 km away from Kannur town of Kannur district, Kerala. It is commonly called as Iriveri kavu. The study area is located in northern part of Kerala, commonly known as Malabar area. Field surveys were made during the period of December 2015 to February 2016 to explore the floristic composition and the ethnomedicinal study of Iriveri Pulideva Temple, Kannur. Geographically Iriveri lies between $11^0 51^1 44^{11}$ N latitude and $75^0 28^1 36^{11}$ E longitude. Temperature is maximum 35^0C and minimum 25^0C. The annual rain fall is 3438mm. Iriveri Kavu is the worship of Pulideva's, the children of Lord Shiva and Parvathi. Nagasthalam is also situated inside the grove. Temple festival is celebrated during the month of February.

Methods
The present study was conducted between the periods from December 2015 to February 2016. During the field visit, the various plants were identified on the basis of spot identification. More information was collected from local peoples, environmentalists and care takers of sacred grove. Field visit was conducted several times and collect ethnobotanical information such as medicinal properties and part of the plant used in medicinal purpose. Plants were identified in the sacred grove and categorized on the basis of IUCN Red data book, various books and research work published by various authors. Identification was further confirmed with the help of taxonomic experts in Botany and Flora of Presidency of Madras.

Result
Floristic composition of the sacred grove in the evergreen region has been recorded. During this study 87 plants belonging to 46 families were recorded and listed out (Table 1). Among 87 species, 86 species of plants were noted as traditional folklore medicinal plants (Table 2). Plants were

enumerated with botanical names, local names (English/Malayalam), family and useful parts in various ailments. Of the 87 species maximum number were dicotyledons (81) followed by monocotyledons (*Caryota urens* L., *Agave americana* L. and *Zeuxine longilabris* (Lindl.) Trimen), gymnosperms (*Cycas circinalis* L and *Gnetum ula* Brongn.) and pteridophytes (*Selaginella* sp.) (Table- 3). Among 87 species, 9 species of Fabaceae family were noted as dominant family: followed by Acanthaceae with 5 species, Asclepidaceae, Combretaceae and Verbenaceae with 4 species each. Besides 6 families represented by 3 species, 8 families represented by 2 species and 27 families represented by single species (Table 4 & 5).The medicinal plants listed above were distributed as 38 trees (43.67%), 23 climbers (26.43%), 15 herbs (17.24%) and 11 shrubs (12.64%), (Table 6). From the interaction with peoples surrounding the area, the ethnomedicinal uses of plants have been documented and presented in Table 2. Ethnomedicinal uses of *Euodia lunuankenda* (Gaertn.) Merr. were not yet revealed. Beside leaves were the most widely used plant part accounting for 30% of the above reported medicinal plant uses, followed by root (22.6%), bark (20.6%), fruits (6%), seeds and whole plant (7.3%) each. Some other parts such as flower, rhizome, stem, latex, aerial parts are also used, which account for 8.6% of the total use of the plants (Table 7).

In the present study 10 plants comes under IUCN Red list category. Among 10 plants *Cycas circinalis* L. and *Euodia lunuankenda* (Gaertn.) Merr comes under endangered category. *Pterocarpus marsupium* Roxb. is considered as vulnerable and 7 species comes under least concern (*Bauhinia acuminata* L., *Bauhinia purpurea* Linn., *Caryota urens* L., *Gnetum ula* Brongn., *Gomphia serrata* (Gaertu).Kanis, *Limnophila repens* (Benth.) Benth., *Lindernia crustacea* (L.) F.Muell.).From the study the value of sacred grove was found as immense. It has been the repositories of rich medicinal plants, wild relatives of crops and many important species, which act as the valuable gene pool. Sacred Groves provide shelter to thousands of flora and fauna. It is considered as reservoir of biodiversity, which consist of RET species. It helps in keeping the water cycle in local areas. Sacred groves improve soil stability, prevent the soil erosion and provide irrigation for agriculture in drier climates.

Table 1: List of plants present in the study area

S.No.	Botanical Name	Habit	Family	Common Name English/Malayalam
1	*Abrus pulchellus* Wall.	Climber	Fabaceae	Showy rosary pea/Valiya kattumuthira
2	*Acacia torta* Craib.	Climber	Fabaceae	Twisted acacia/ Kallinga
3	*Adenanthera pavonina* L.	Tree	Mimosaceae	Red sandal tree/ Manchadi
4	*Agave americana* L.	Shrub	Amaryllidaceae	American aloe/ Eroppa kaitha
5	*Ailanthus excelsa* Roxb.	Tree	Simaroubaceae	Tree of heaven/ Matti
6	*Alseodaphne semecarpifolia* Nees.	Tree	Lauraceae	Mulakunari
7	*Bauhinia acuminata* L.	Shrub	Cesalpiniaceae	White orchid tree/ Mandharam
8	*Bauhinia purpurea* Linn.	Tree	Cesalpiniaceae	Purple orchid tree/ Mandharam
9	*Blepharistemma serratum* (Dunst.)	Shrub	Rhizophoraceae	Neerkurunda
10	*Blumea lacera* DC.	Herb	Asteraceae	Kukkuram
11	*Blumea laciniata* DC.	Herb	Asteraceae	Cut leaf blumea
12	*Breynia vitis-idaea* (Burm f.) C.E.C Fisch.	Tree	Phyllanthaceae	Indian snowberry/ Kattuniruri
13	*Bridelia retusa* Spr.	Tree	Phyllanthaceae	Spinous kino tree/ Mulluvenga
14	*Calycopteris floribunda* Lam.	Climber	Combretaceae	Paper flower climber/ Pullanni
15	*Cansjera rheedii* Gmel.	Climber	Opiliaceae	Rheed's false olive/ Vallikanjiram
16	*Careya arborea* Roxb.	Tree	Lecythidaceae	Wild guava/ Alam
17	*Caryota urens* L.	Tree	Arecaceae	Elephant,s palm/ Anapana
18	*Cayratia trifolia* (L.) Domin.	Climber	Vitaceae	Three leaf/ Vathakkodi
19	*Chonemorpha fragrans* (Moon) Alst.	Climber	Apocynaceae	Frangipani vine/ Perumkurumba
20	*Cinnamomum malabatrum* (Burm.f) Presl.	Tree	Lauraceae	Kattukaruvappatta
21	*Cissus repens* Lam.	Climber	Vitaceae	Cissus/ Chunnapu valli
22	*Cissus repanda* (Vahl).	Climber	Vitaceae	Pani Bel
23	*Clerodendron infortunatum* L.	Shrub	Verbenaceae	Hill glory bower/ Vatta perivilam
24	*Clinacanthus nutans* (Burm.f.) Lindau.	Herb	Acanthaceae	Sabah snake grass
25	*Connarus wightii* Hook.f.	Shrub	Connaraceae	Kuringil
26	*Cosmostigma racemosum* W.	Climber	Asclepidaceae	Green milk weed creeper/ Vattuvalli
27	*Cycas circinalis* L.	Tree	Cycadaceae	Queen sago/ Eenth
28	*Cyclea peltata* Hook.f.Thoms	Climber	Menispermaceae	Paadathaali
29	*Dalbergia horrida* (Dennst) Mabb.	Climber	Fabaceae	Jadavalli
30	*Desmodium triquetrum* DC.	Herb	Fabaceae	Trefle gros/ Adakkapaanal
31	*Diploclisia glaucescens* Diels.	Climber	Menispermaceae	Vattavalli
32	*Disopyros candolleana* Wight.	Tree	Ebenaceae	Karimaram
33	*Euodia lunu-ankenda* (Gaertn.) Merr.	Tree	Rutaceae	Euodia/ Kattu rubber
34	*Erycibe paniculata* Roxb.	Climber	Convolvulaceae	Panicled Erycibe/ Nakkuvalli
35	*Ficus arnotiana* Miq.	Small tree	Moraceae	Indian rock fig/ Kallarayal
36	*Ficus benjamina* L.	Tree	Moraceae	Weeping fig/ Putrajuvi
37	*Ficus hispida* L.f.	Tree	Moraceae	Hairy fig/ Erumanaakk
38	*Flacourtia indica* (Burm.f.) Merr.	Tree	Bixaceae	Governor's plum/ Karimulli
39	*Gnetum ula* Brongn.	Climber	Gnetaceae	Gnemon tree/ Karuthodal

40	*Gomphia serrata* (Gaertu).Kanis.	Shrub	Ochnaceae	Chavakampu
41	*Grewia nervosa* (Lour.) G.Panigrahi.	Shrub	Tiliaceae	Shiral/ Cherikotta
42	*Hedyotis corymbosa* (L) Lam.	Herb	Rubiaceae	Diamond flower/ Parppatakappullu
43	*Hyptis suaveolens* Poit.	Shrub	Lamiaceae	Nattapoochedi
44	*Justicia gendarussa* L.f.	Shrub	Acanthaceae	Gandarusa/ Vathamkolli
45	*Lagerstroemia speciosa* (L) Pers.	Tree	Lythraceae	Queen's flower/ Manimaruthu
46	*Lepidagathis incurva* Buch.Ham.ex D.Don.	Herb	Acanthaceae	Curved lepidagathis
47	*Limnophila repens* Benth.	Herb	Scrophulariaceae	Creeping marsh weed/ Manganari
48	*Lindernia crustacea* (L.) F.Muell.	Herb	Linderniaceae	Brittle false pimpernel/Tsjanga puspam
49	*Mallotus philippinensis* Muell.Arg.	Tree	Euphorbiaceae	Kamala dye tree/ Kurukkutti
50	*Melestoma malabathricum* L.	Shrub	Melastomaceae	Malabar melastome/ Athirani
51	*Memecylon umbellatum* Burm.f.	Tree	Melastomaceae	Iron wood tree/ Kaayampoo
52	*Merremia umbellata* Hall.f.	Climber	Convolvulaceae	Hogvine/ Vayaravalli
53	*Mucuna pruriens* Baker.	Climber	Fabaceae	Velvet bean/ Naikorana
54	*Naregamia alata* Wight and Arn.	Herb	Meliaceae	Nilanarakam
55	*Nothapodytes nimmoniana* (J.Grah.) D.J Mabberley.	Tree	Stemonuraceae	Ghanera/Peenari
56	*Olea dioica* Roxb.	Tree	Oleaceae	Rose sandal wood/ Edala
57	*Pavetta indica* L.	Tree	Rubiaceae	Pavetta/ Vella pavetta
58	*Phyllanthus reticulatus* Poir.	Climber	Phyllanthaceae	Black honey shrub/ Nirnelli
59	*Pleumaria alba* L.	Tree	Apocynaceae	White frangipani/ Chempakam
60	*Polyalthia korinti* Hk.f. & T.	Tree	Anonaceae	Karuvalli
61	*Pongamia pinnata* (L.) Panigrahi.	Tree	Fabaceae	Indian beech/ Ponnu
62	*Premna latifolia* Roxb.	Small tree	Verbenaceae	Arani
63	*Pseuderanthemum malabaricum* Gamb.	Shrub	Acanthaceae	Malabar false eranthemum
64	*Pterocarpus marsupium* Roxb.	Tree	Fabaceae	Bastard teak/ Venga
65	*Rungia pectinata* Nees.	Herb	Acanthaceae	Comb rungia/ Tavasmurungi
66	*Salacia fruticosa* Laws.	Climber	Hippocrataceae	Ekanayakam
67	*Samanea saman* (Jacq.) Merr.	Tree	Fabaceae	Rain tree
68	*Selaginella* sp.	Herb	Selaginellaceae	Creeping moss/ Garudapacha
69	*Spermacoce latifolia* Aubl.	Herb	Rubiaceae	Button weed/ Puchha palla
70	*Sterculia guttata* Roxb.	Tree	Sterculiaceae	Spotted sterculia/ Kavalam
71	*Strychnos nux-vomica* L.	Tree	Loganiaceae	Nux vomica/ Kanjiram
72	*Strychnos vanprukii* Craib.	Climber	Loganiaceae	Poison nut/ Valli kanjiram
73	*Tabernamontana alternifolia* L.	Tree	Apocynaceae	Kunninpala
74	*Tectona grandis* L.f.	Tree	Verbenaceae	Teak/ Thekku
75	*Telosma pallida* Craib.	Climber	Asclepidaceae	Paalkurumba
76	*Terminalia arjuna* Wight & Arn.	Tree	Combretaceae	Arjuna tree/ Neermaruthu
77	*Terminalia bellirica* Roxb.	Tree	Combretaceae	Bedda nut tree/ Thannikka
78	*Terminalia catappa* L.	Tree	Combretaceae	Indian almond/ Badam
79	*Tragia involucrata* L.	Herb	Euphorbiacae	Indian stringing nettle/Kodithoova
80	*Tylophora indica* (Burm.f.) Merr.	Climber	Asclepidaceae	Vallippala
81	*Ventilago maderaspatana* Gaertn.	Climber	Rhamnaceae	Red creeper/ Vempata
82	*Vernonia cinerea* Less.	Herb	Asteraceae	Purple fleabane/ Poovamkurunal
83	*Vitex altissima* L.f.	Tree	Verbenaceae	Peacock chaste tree/ Mylellu
84	*Wattakaka volubilis* (L.fil.) stapf.	Climber	Asclepidaceae	Green milk weed climber/ Vattakakkakkoti
85	*Xylia xylocarpa* Taub.	Tree	Fabaceae	Indian iron tree/ Irul
86	*Zanthoxylum rhetsa* DC.	Tree	Rutaceae	Indian prickly ash/ Kothumurikku
87	*Zeuxine longilabris* Benth.	Herb	Orchidaceae	Long lipped zeuxine/ Thumpapoovu orchid

Table 2: Ethnomedicinal uses of the species present in the Iriveri Kavu

S.No.	Botanical Name	Part Used	Medicinal Uses
1	*Abrus pulchellus* Wall.	Leaves and Root	It cures diseases like coryza, cough, gonorrhoea and skin infections.
2	*Acacia torta* Craib.	Bark	Used for reducing swelling, pain etc and also used as antiseptic.
3	*Adenanthera pavonina* L.	Seeds and leaves	Seeds-treat boils and inflammations Decoction of leaves used to treat gout and rheumatism.
4	*Agave americana* L.	Root and Leaves	It takes against toothache, weak digestion, intestinal gas, diarrhoea, dysentery.
5	*Ailanthus excelsa* Roxb.	Stem bark	It is used for the treatment of skin diseases, fever and treating bleeding disorders.
6	*Alseodaphne semecarpifolia* Nees.	Stem bark	Used for dysentery, foot and mouth diseases.
7	*Bauhinia acuminata* L.	Bark, Flower and Root	Skin diseases, worms, tumours and diabetes.
8	*Bauhinia purpurea* Linn.	Bark, Leaves, Root, Flowers, Stem	It is used for effective abscess, convulsions, cough, diabetes, edema, rheumatism, jaundice, dysentery, leprosy, piles.

9	*Blepharistemma serratum* (Dunst.)	Tender leaves, Fruits, Bark of Tree	Used for headache and remove patches on skin.
10	*Blumea lacera* DC.	Whole plant and Root	Root-Cure diseases of mouth Whole plant- Wound healing, buccal diseases, bleeding piles.
11	*Blumea laciniata* DC.	Leaves	It is used to cure lung diseases.
12	*Breynia vitis-idaea (*Burm f.) C.E.C Fisch.	Whole plant	It is used to tonsillitis, haemorrhage, diabetes and dental caries.
13	*Bridelia retusa* Spr.	Bark	Used as, hypotensive and hypoglycaemic.
14	*Calycopteris floribunda* Lam.	Leaves and Fruits	Leaves- leprosy, fever, dysentery, ulcers and vomiting Fruit used for jaundice, ulcers and skin diseases.
15	*Cansjera rheedii* Gmel.	Leaves	It is having anti diabetic property.
16	*Careya arborea* Roxb.	Bark and Sepals	It is used for the treatment of cough, cold and it is applied externally as an embrocation.
17	*Caryota urens* L.	Tender bud leaves and Flowers	It is used for Dipsia, swelling, migraine, rheumatism, snake bite and antioxidant.
18	*Cayratia trifolia* (L.) Domin.	Stem	Stem extraction is used for abdominal pains.
19	*Chonemorpha fragrans* (Moon) Alst.	Roots and Leaves	These are used to cure stomach problems, cancer, cough, tumours and fever.
20	*Cinnamomum malabatrum* (Burm.f) Presl.	Bark	Bark is used to cure, cough, headache, spider poison and as a mouth refresher.
21	*Cissus repens* Lam.	Leaf	Leaf extract taken against fever.
22	*Cissus repanda* (Vahl).	Root	Significant anti-inflammatory and analgesic and preferred it for the treatment of pain and inflammation.
23	*Clerodendron infortunatum* L.	Leaves, Roots and Bark	It is used as herbal remedy for hair loss, asthma, cough, Diarrhoea, rheumatism, fever, skin diseases and respiratory diseases.
24	*Clinacanthus nutans* (Burm.f.) Lindau.	Whole plant	It is used for diabetes, fever, anaemia and help to relief from pain.
25	*Connarus wightii* Hook.f.	Root	Nerve swelling- Root ground with citrus reticulate into paste and applied externally around the swelling.
26	*Cosmostigma racemosum* W.	Leaves	Used to treat ulcerous sores.
27	*Cycas circinalis* L.	Bark, Seeds and Tender leaves	Bark and Seed are ground to a paste with oil and used as a poultice on sores and swellings. Juice of tender leaves is useful in the treatment of vomiting.
28	*Cyclea peltata* Hook.f.Thoms	Leaves	It is help to cure fever and used for herbal preparations.
29	*Dalbergia horrida* (Dennst) Mabb.	Roots	Root extract having analgesic, anti-inflammatory and mild antibacterial properties.
30	*Desmodium triquetrum* DC.	Leaves	Leaves extract is used in piles and colic and the dried leaves extract shows wound healing activity.
31	*Diploclisia glaucescens* Diels.	Leaf, Root and Bark	Leaf extract is used against diarrhoea Powdered leaf with milk given in gonorrhoea and syphilis Root and bark are claimed to be stomachic, improve appetite, useful in piles, abdominal pains, fever, burning sensations.
32	*Disopyros candolleana* Wight.	Root bark	Used against joint pain.
33	*Euodia lunuankenda* (Gaertn.) Merr.	Root	Roots are used to treat colds and rheumatism
34	*Erycibe paniculata* Roxb.	Bark and Root and Fruit	Root prescribed internally in fever Ripe fruit eaten in constipation Bark is used in cholera.
35	*Ficus arnotiana* Miq.	Leaves and Bark	Leaves used for control fertility. Bark is used as astringent and also for diarrhoea, diabetes, leprosy, scabies, wound and ulcer protective.
36	*Ficus benjamina* L.	Bark, Root and Leaves	Leaves boiled in oil and applied on wounds and bruises Juice of bark used against liver diseases Powdered leaf and bark used for headache.
37	*Ficus hispida* L.f.	Fruits and Leaves	Fruit juice is mixing with honey is a good anti haemorrhage Chew the leaves for diarrhoea Different parts of the plant are used for dysentery, ulcers, psoriasis, piles and jaundice.
38	*Flacourtia indica* (Burm.f.) Merr.	Roots, Leaves and Bark	Leaves and Roots are used in herbal medicine for treatment of snake bite. & Bark is effective for joint pain. Most of the plant parts are used to cure cough, pneumonia and bacterial throat infection.
39	*Gnetum ula* Brongn.	Seeds	Used for skin burning.
40	*Gomphia serrata* (Gaertu).Kanis.	Young branches Leaves and Roots	It is used as tonic for stomachic and preventing vomiting. Young branches are used for toothache.
41	*Grewia nervosa* (Lour.) G.Panigrahi.	Leaves and Bark	Treatment of diabetes and its associated complications such as oxidative stress and inflammation.

42	*Hedyotis corymbosa* (L) Lam.	Whole plant and Root	It takes against stomach ache, appendicitis, hepatitis, diarrhoea, dysentery, constipation and urinary tract infection.
43	*Hyptis suaveolens* Poit	Root and Leaves	Decoction of root valued as appetizer Leaves juice applied to athlete's foot and ring worm lesions Leaf paste used for skin infections and cancers.
44	*Justicia gendarussa* L.f.	Bark and Leaves	Bark is a good emetic Leaves are used for chest pain, rheumatism.
45	*Lagerstroemia speciosa* (L) Pers.	Roots and Leaves	Roots are used for stomach problems Leaves are used for diabetes and for weight loss.
46	*Lepidagathis incurva* Buch.Ham.ex D.Don.	Leaves	Treatment of blindness and ear infection.
47	*Limnophila repens* Benth.	Whole plant	Whole plant paste is mixed with mimosa is used to treat leucoderma.
48	Lindernia crustacea (L.) F.Muell.	Whole plant	Whole plant is used for ringworms itches, dysentery and sores. Leaf paste with lemon juice applying orally to cure bile secretion.
49	*Mallotus philippinensis* Muell.Arg.	Fruit and bark	Fruit and fruit hairs using for internal cleansing purposes Bark is an excellent anti microbial agent.
50	*Melestoma malabathricum* L.	Roots and leaves	Roots- Mouth wash for toothache Extraction of leaves cure wounds and against stomach problems and diarrhoea.
51	*Memecylon umbellatum* Burm.f.	Leaves and Roots	Leaf powder used against diabetes Roots are used against excessive menstrual discharge.
52	*Merremia umbellata* Hall.f.	Root and Leaves	Used for swelling and ulcers.
53	*Mucuna pruriens* Baker.	Bean, Seed and Leaves	Bean is used to treat nervous disorders and arthritis Seed is for Parkinson disease Leaves having antimicrobial and antioxidant activity.
54	*Naregamia alata*.Wight and Arn.	Whole plant	Used for fever, anaemia, arthritis and asthma.
55	*Nothapodytes nimmoniana* (J.Grah.) D.J Mabberley.	Leaf and Stem	Both having antimicrobial and anticancerous activity.
56	*Olea dioica* Roxb.	Bark and leaves	Used for reducing fever.
57	*Pavetta indica* L.	Bark, Leaves and Roots	Bark is used for visceral obstructions Leaves and roots used in poultices for boils and itches Roots used for constipation and urinary complaints.
58	*Phyllanthus reticulatus* Poir.	Leaves and Roots	It is used as the medicine for the fracture and traumatic injury
59	*Pleumaria alba* L.	Root, Leaves, Latex and Bark	Skin diseases, inflammations, arthritis and constipation.
60	*Polyalthia korinti* Hk.f.&T	Root	Oral administration of root powder decoction is an antidote for Russell viper bite.
61	*Pongamia pinnata* (L.) Panigrahi	Fruits, Seeds, Leaf, Bark, Flowers	Fruits are used to cure abdominal tumour Seeds- skin ailments Leaf juice- cold, coughs, dyspepsia, leprosy and gonorrhoea Bark-for bleeding piles, disease of eye, skin, vagina and wounds and Flowers used for diabetes.
62	*Premna latifolia* Roxb.	Roots and Leaves	Roots useful in inflammations, cardiac disorders, cough, asthma and bronchitis and Leaves are useful in dyspepsia, neuralgia and tumours.
63	*Pseuderanthemum malabaricum* Gamb.	Roots	Used to cure diarrhoea.
64	*Pterocarpus marsupium* Roxb.	Bark and Leaves	Bark is used for bleeding and toothache Leaves using externally for skin diseases and maintain blood sugar level.
65	*Rungia pectinata* Nees.	Leaves and Root	Leaf juice as coolant and prescribed for children suffering from small pox. Bruised leaves applied to relieve pain and swelling. Roots are used to cure fever.
66	*Salacia fruticosa* Laws.	Root and Stem	It is used to treat diabetes, gonorrhoea, asthma, joint pain, obesity, thirst and menstrual problems.
67	*Samanea saman* (Jacq.) Merr.	Roots and Seeds	Root is used for stomach cancer and seeds are chewed for sore Throat
68	*Selaginella sp.*	Whole plant	Used for skin diseases, snake poison, traumatic edema and general debility.
69	*Spermacoce latifolia* Aubl.	Aerial parts	It exhibits antioxidant activity.
70	*Sterculia guttata* Roxb.	Bark and Seed	It is used to cure swelling, fever and diarrhoea
71	*Strychnos nux-vomica* L.	Seed	It is used for disease of the digestive tract, heart disorders, and diseases of eye, lung and depression.
72	*Strychnos vanprukii* Craib.	Whole plant	Disease of digestive tract, heart disorder, lung diseases and blood vessel disorder.
73	*Tabernamontana alternifolia* L.	Root	It is used for the treatment of toothache.
74	*Tectona grandis* L.f.	Wood and Bark	Bark-Diuretic, astringent and used against swelling Wood is used for skin irritations.
75	*Telosma pallida* Craib.	Fruit	Latex of fruit and fruit paste use externally on the localized white patches during the initial stages of leucoderma disease.
76	*Terminalia arjuna* Wight & Arn.	Bark	It is having anti cancerous activity and cure cardiovascular diseases.

77	*Terminalia bellirica* Roxb.	Bark, Seed, Fruit, and Whole plant	Plant parts are used in the treatment of weak eyesight, gray hair, and anaemia.
78	*Terminalia catappa* L.	Leaves and Bark extract	It is used against cancer and diabetes.
79	*Tragia involucrata* L.	Roots and Leaves	Roots are useful in puritic skin eruptions, veneral diseases, diabetes, and guinea worms. Leaves are supposed to be good for headache.
80	*Tylophora indica* (Burm.f.) Merr.	Leaves and Roots	Roots used to cure cough, asthma and bronchitis Leaves are used for dysentery and diarrhoea.
81	*Ventilago maderaspatana* Gaertn.	Rhizome, Seeds and Roots	The rhizome roots are used in the treatment of cough, rheumatism and wound. Roots are antibacterial, hypotensive and used in mucosal irritation, nausea and vomiting.
82	*Vernonia cinerea* Less.	Seeds	Seeds are used for killing worms, decrease gas troubles and used in leucoderma and skin diseases.
83	*Vitex altissima*.L.f.	Roots and leaves	The plant is believed to pacify vitiated kapha, vata, inflammation, wounds, ulcers, allergy, worm infestations and urinary system diseases.
84	*Wattakaka volubilis* (L.fil.) stapf.	Leaves	Application to boils and swelling.
85	*Xylia xylocarpa* Taub.	Bark	Decoction of bark given in gonorrhoea and diarrhoea. It helps stop vomiting as a vermifuge.
86	*Zanthoxylum rhetsa* DC.	Bark and Fruit	Decoction of bark is taken internally as a cure for pain in chest. Fruits are used to cure asthma, bronchitis, heart troubles and toothache.
87	*Zeuxine longilabris* Benth.	Whole plant	Entire plant ground and made into pills, orally administrated 3 pills a day for cure cough.

Red Listed Plants

Cycas circinalis L.

Euodia lunuankenda (Gaertn.) Merr.

Pterocarpus marsupium Roxb.

Table 3: List of plant species coming under various classes

S.No.	Class	Number	Percentage
1	Pteridophytes	1	1.14
2	Gymnosperms	2	2.29
3	Dicotyledons	81	93.10
4	Monocotyledons	3	3.44

Table 4: Families having maximum number of species present in the study area

S. No.	Family	Number of Species
1	Acanthaceae	5
2	Apocynaceae	3
3	Asclepidaceae	4
4	Asteraceae	3
5	Cesalpiniaceae	2
6	Combretaceae	4
7	Convolvulaceae	2
8	Euphorbiaceae	2
9	Fabaceae	9
10	Verbenaceae	4
11	Lauraceae	2
12	Loganiaceae	2
13	Melastomaceae	2
14	Menispermaceae	2

15	Moraceae	3
16	Phyllanthaceae	3
17	Rubiaceae	3
18	Rutaceae	2
19	Vitaceae	3

Table 6: Percentage distribution of plant species based on Habit

S. No.	Habit	Number Of Plants	Distribution (%)
1	Herb	15	17.24
2	Shrub	11	12.64
3	Tree	38	43.67
4	Climber	23	26.43

Table 7: Percentage distribution of various plant parts present in the study area

S.No.	Plant Parts	Distribution (%)
1	Leaves	30
2	Root	22.6
3	Bark	20.6
4	Seeds	7.3
5	Whole plant	7.3
6	Fruits	6
7	Other parts	8.6

Table 8: List of red listed plants in the sacred grove according to IUCN Red Data Book.

S. No.	Botanical Name	Status
1	*Cycas circinalis* L.	Endangered
2	*Euodia lunuankenda* (Gaertn.) Merr.	Endangered
3	*Pterocarpus marsupium* Roxb.	Vulnerable

Discussion

More than thousand sacred groves found all over India. It is not only place where number of rare plant species but also number important medicinal plants are conserved and preserved for primary health care of surrounding people of the area. Floristic composition of the sacred grove in the evergreen region has been recorded. During this study 87 plants belonging to 46 families were collected and identified its botanical name with family and local name. Similar study was done by Jayapal *et al.,* (2013) [12], Neiveli Vadavadhi Karuppar sacred grove at Thanjavur district was explored for floristic studies and reported for the first time. Totally 117 plant species belonging to 51 families and 102 genera were recorded in this grove.

In this study among 87 species 86 species of plants were noted as traditional folklore medicine. D Ramesh *et al.*, (2013) [25] collected 87 medicinal plant species belonging to 42 families. He revealed that the sacred groves are not only place where number of rare plant species but also number of important medicinal plants are conserved and preserved for paimary health care of surrounding people of the area. Plants are categorized under various classes (dicot, monocot, gymnosperms and pteridophytes). Of the 87 species, maximum number was dicotyledons. Ratio of the species level between monocot and dicot is 1:27 which was supported by Sulekha and Shringi (2014) [36]. Here the ratio of species level between monocots to dicots is 1: 4.9. General pattern of vegetation varies from region to region because of great fluctuation of climate. The genus Ficus is predominantly present in this sacred grove. Gadgil *et al*., (1996) also reported that Ficus is the most revered tree of the orient and no species is traditionally felled. It is an evergreen region distributed as trees, climbers, herbs and shrubs. Gadgil and Vartak, (1974) revealed that the absence of human interference the sacred forests support the climax vegetation appropriate for their particular locality. Such climax vegetation is rich in species of trees, climbers and epiphyte. The floristic composition of the sacred groves indicates the pre-existence of climax vegetation in the area (Vartak *et al.,* 1986). As such, this grove is serving the vital function in preservation of plant species that have become very rare or extinct elsewhere.

In this study leaves were the most widely used plant part accounting for 30% of the above reported medicinal plant uses, followed by root (22.6%), bark (20.6%), fruits (6%), seeds and whole plant (7.3%) each. Some other parts such as flower, rhizome, stem, latex, aerial parts are also used, which account for 8.6% of the total use of the plants. Similar data was reported in the study of Ramesh *et al*., (2013) [25] were leaves (44%), root bark (14%), stem bark (9%), fruit (9%), whole plant (8%), seed (5%), rhizome (2%), tuber (2%) and gum (1%). The plants were used singly or in combination with other plant to treat the diseases and time to be taken for the treatment disease either short period of time or long period of time depending on severances of disease and condition of the patent. The present study resulted in the collection of 10 red listed plants; this supports the view expressed by various workers (Gadgil and Vartak, (1976); Unnikrishnan, (1995) that sacred groves are the treasure houses of rare and endemic species. Sacred groves have become fragmented habitats housing gene pools and became the last refuge for many rare, threatened, endangered and endemic plants (Anish Babu *et al., (2014)* [2].

Conclusion

This study revealed that a number of valuable plant species are found in the sacred groves. If conservation measures are not introduced in the near future there may be a great loss of plant diversity. Nowadays the peoples are susceptible to the various diseases because they are living in polluted atmospheric condition of the modern world. So the herbal based medicine only tackles the problem. Hence every house should be maintaining some locally available medicinal plant in their garden to meet out their need for primary health care.

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