



Research article

Taxonomical and phytosociological studies on Chithalikavu- A sacred grove, Thrissur district, Kerala

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Abstract: Groves contains natural forest and also rich in biodiversity. They are protected by local communities because of their deities linked with these forest patches. The present study was conducted in Chithalikavu, a sacred grove of Thrissur district to know the plant diversity and their structural parameters. Floristic composition of Chithalikavu sacred grove revealed that the occurrence of 57 species of angiosperms belonged to 54 genus and 35 families. Among them 29.82% trees, 24.56% shrubs, 15.79% herbs and 29.83% climbers. The parameters like frequency, relative frequency, density, relative density and importance value index were estimated by using standard procedures. *Strychnos nux-vomica* was recorded as the most dominant species in the community as it constituted highest IVI. Other dominant species of the community were *Ficus benghalensis* and *Terminalia paniculata*. The highest basal area was reported in *Ficus benghalensis*.

Keywords: Chithalikavu - Sacred grove - Kerala - Phytosociology - Quadrets - Taboos.

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INTRODUCTION

Sacred groves are small patches of native forests and act as abodes of gods, protected by local communities, exist all over the world. These are known as “Kavu” or “Sarpakavu” in Kerala. According to Malhotra *et al.* (2001) groves are those area dedicated by local communities to their ancestral spirits or deities. These have immense value from genetic diversity as well as ecological point of view and rich in flora. They are the repository of several medicinal and economically important plants. Attached with socio-cultural and religious sentiments these exist as undisturbed islands. But today these are adversely affected by human activities.

These sacred groves are protected usually through taboos and sanctions with cultural and ecological implications. There are more than 2000 sacred groves occur in Kerala (Pushpangadan *et al.* 1998). These acts as treasure houses of plants and animals and can satisfy scientific, cultural and aesthetic needs of mankind. In Kerala groves are mainly dedicated to Serpant gods and Folk deities. Many threatened species existed in the sacred groves of Kerala (Nair & Mohanan 1981) and it preserving unique species of plants, insects and animals (Venkatachalam *et al.* 2005). Therefore it acts as a tool for biodiversity conservation (Gaikwad *et al.* 2004).

MATERIALS AND METHODS

Study Area

The study was conducted in Chithalikavu, a sacred grove of Talappilly taluk, Thrissur district, Kerala state, lies in 10°73'21" N and 76°42'73" E with an area of ca.1.73 ha. The management of these kavu is under the control of Chithali family members. The main deities are Nagam (Snake God) and Bhagavathy (Godes). Protection of this kavu is mainly due to the presence of deities. This area receives both Southwest and Northeast monsoons during June–August and October–December respectively. In Chithalikavu compound wall or fencing were absent, therefore external disturbance like grazing, stem cutting, illegal medicinal plants collection are present and one side of grove soil had less humus cover.

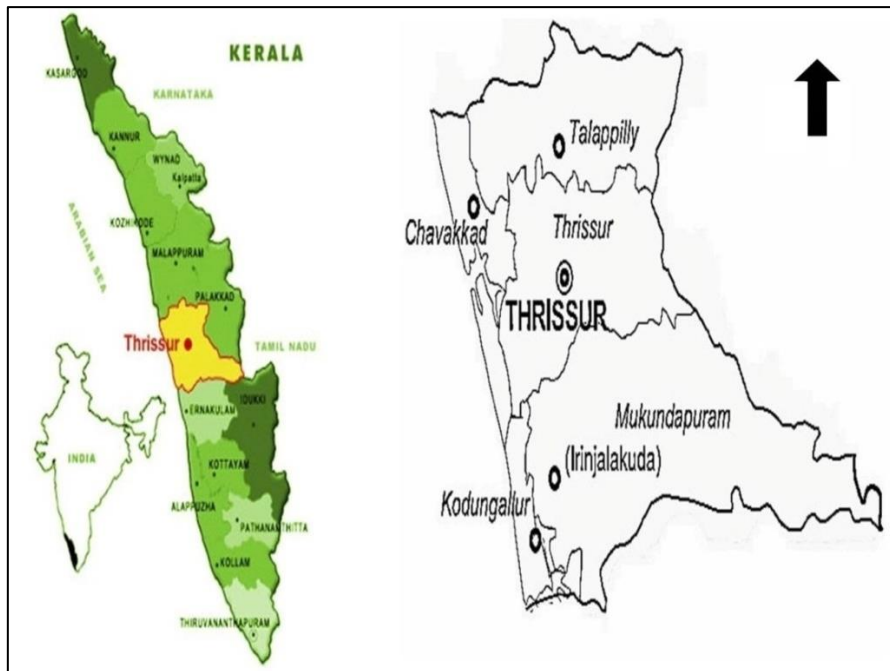


Figure 1. Map showing the study area: Thirissur district of Kerala, India. [Adopted from Deepa *et al.* (2016)]

Plant collection

Floristic composition of this grove was recorded during field visits and plant collection conducted over different seasons between April 2013 and September 2015. All the Angiosperms including trees, shrubs, herbs and climbers were considered for the study. Important field observation such as habit, habitat, local names and medicinal uses available were noted in the field book. Plant materials of proper size with relevant parts were collected from the field and sealed in polyethylene covers after treating with formaldehyde. Herbaria were prepared, processed and labeled by following standard herbarium methods given by Jain & Rao (1977). Each species in fresh condition were critically studied with the help of floras (Gamble 1915–1936, Sasidharan & Sivarajan 1996), Monographs, publications, etc and provisional determination was made. The identity of the taxon was confirmed with type materials deposited at E, K, CAL, MH, KFRI and protologue. The voucher specimens are deposited at Sree Krishna College, Guruvayur, Thirissur, Kerala.

Ecological data collection and analysis

Phytosociological study by quadrat method was also conducted for describing the Structural features of the grove. Size and number of the quadrat was determined by the species area curve method (Shailaja & Sudha 2001). Two quadrates of 20 m × 20 m size were randomly established in the study site for the studies of tree species (Bajpai *et al.* 2015). Each quadrat was then systematically surveyed by identifying and all trees with girth at breast height (gbh) greater than and equal to 30 cm were recorded for analysis. Tree girth measurements were made as per Poffenberger *et al.* (1992).

The numerical value obtained were analyzed to find out frequency, relative frequency, density, relative density, relative basal area and importance value index were estimated by using standard formula (Curtis & McIntosh 1950, Krebs 1989, Phillips 1959).

RESULTS

The present taxonomic study in Chithalikavu resulted in the collection and identification of 57 species of angiosperms belonged to 54 genus and 35 families. Among them 29.82 % trees, 24.56 % shrubs, 15.79 % herbs and 29.82 % climbers. During the study an endemic plant to Peninsular India (*Canthium rheedei* DC.), and under two near threatened species like *Piper longum* L. and *Tinospora sinensis* (Lour.) Merr. (Ravikumar & Ved 2000) were collected. Almost all the plants found in the grove have medicinal properties.

During this study Euphorbiaceae was recorded as the dominant family with seven species of six genera, followed by Fabaceae (five species of five genera) while Amaranthaceae, Meliaceae, Poaceae, Oxalidaceae, Bombacaceae, Caricaceae, Combretaceae, Convolvulaceae, Cucurbitaceae, Dioscoreaceae, Hypoxidaceae, Leeaceae, Liliaceae, Loganiaceae, Oleaceae, Periplocaceae, Piperaceae, Poaceae, Ranunculaceae are the

families represented by only one species. *Phyllanthus*, *Sida* and *Tinospora* were the largest genus with 2 species while 51 genera were denoted by only one species in each. Because of their medicinal values *Aerva lanata* (L.) Juss. ex Schult., *Azadirachta indica* A. Juss., *Canthium rheedei* DC., *Cassia fistula* L., *Ficus benghalensis* L., *Gloriosa superba* L., *Glycosmis pentaphylla* (Retz.) DC., *Naravelia zeylanica* (L.) DC., *Piper longum* L., *Strychnos nux-vomica* L., *Terminalia paniculata* Roth. and *Tinospora cordifolia* (Willd.) Miers. are the some important plants of the study area (Fig. 2). Botanical name of each plant with their family, local name, habit phenology (flowering and fruiting) and medicinal uses have been provided in table 1.

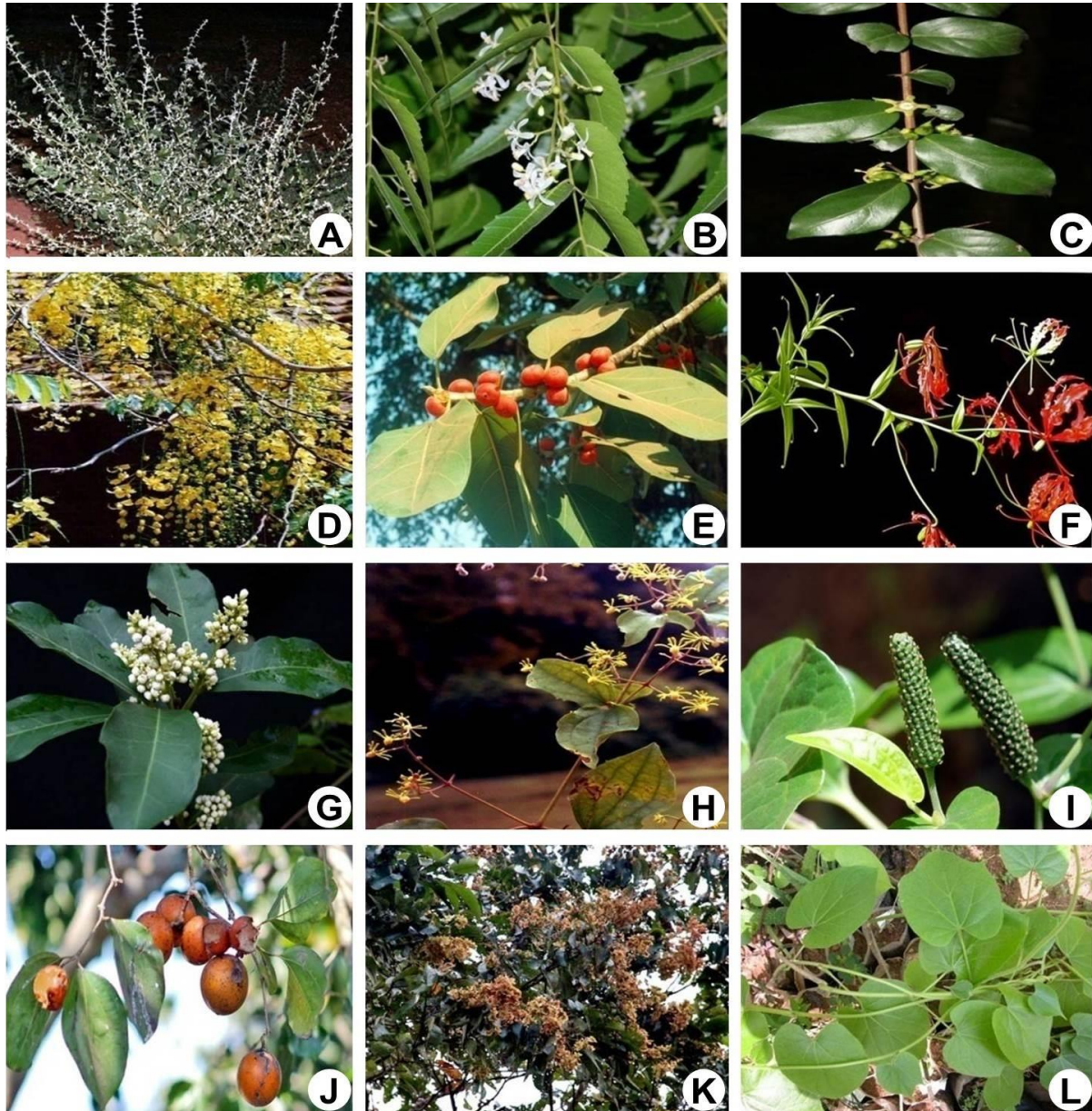


Figure 2. Some important plants in Chithalikavu: **A**, *Aerva lanata* (L.) Juss. ex Schult.; **B**, *Azadirachta indica* A. Juss.; **C**, *Canthium rheedei* DC.; **D**, *Cassia fistula* L.; **E**, *Ficus benghalensis* L.; **F**, *Gloriosa superba* L.; **G**, *Glycosmis pentaphylla* (Retz.) DC.; **H**, *Naravelia zeylanica* (L.) DC.; **I**, *Piper longum* L.; **J**, *Strychnos nux-vomica* L.; **K**, *Terminalia paniculata* Roth.; **L**, *Tinospora cordifolia* (Willd.) Miers.

Only eight tree species were observed in the study area. Among them *Strychnos nux-vomica* L. was the dominating species because of having the maximum value of Importance Value Index (IVI) Beside *Strychnos nux-vomica* (IVI = 1.085), *Ficus benghalensis* L. (0.634), *Terminalia paniculata* Roth (0.338) and *Schleichera oleosa* (Lour.) Oken (0.309) were the other important tree species from Chithalikavu. Maximum density was showed by *Strychnos nux-vomica* as 325 ha⁻¹ followed by *Caryota urens* L. (37.5 ha⁻¹) and *Terminalia paniculata* Roth (25 ha⁻¹) (Table 2). The highest relative basal area was recorded in *Ficus benghalensis* L. (0.515).

Table 1. Species recorded from sacred groves with their family, local name, habit, phenology (flowering and fruiting) and medicinal uses. (H- Herb, S- Shrub, T- Tree, C- Climber)

S. No.	Col. No.	Botanical name	Family	Local name	Habit	Phenology	Medicinal uses
1	198	<i>Aerva lanata</i> (L.) Juss. ex Schult.	Amaranthaceae	Cherula	H	September – April	Used in urinary obstructions, bladder stones and haemorrhages associated with pregnancy.
2	061	<i>Albizia saman</i> (Jacq.) F. Muell.	Mimosaceae	Mazhamaram	T	March – May	Used in hot baths for stomach cancer and remedy for colds, diarrhea, headache, intestinal ailments, stomachache and sore throat.
3	014	<i>Amorphophallus paeoniifolius</i> (Dennst) Nicolson	Araceae	Kattuchena	H	May – June	Used in dysentery, piles, cough, applied externally to treat rheumatism, ophthalmia, cure diarrhea, rheumatic swellings, elephantiasis and vomiting.
4	114	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Ariyavepu	T	February – September	Used in skin diseases, ulcers, eczema, rheumatism, intestinal worms, impurity of blood, eye diseases, diabetes, small pox, chicken pox, ringworm, scabies etc.
5	144	<i>Bambusa bambos</i> (L.) Voss	Poaceae	Mula	S	July – February	Haemorrhoid, diarrhoea, wounds, skin diseases, fever, cough, shortness of breath, vomiting, cardiac diseases and skin diseases
6	146	<i>Biophytum reinwardtii</i> (Zucc.) Klotzsch	Oxalidaceae	Mukkutti	H	July – December	It is used in strangury, urinary calculi, hyperdipsia, wounds, asthma, stomachalgia, snakebite and insomnia.
7	070	<i>Bombax ceiba</i> L.	Bombacaceae	Poola	T	January – April	Used in calculous affections and ulceration of bladder and kidneys, dysentery, pulmonary tuberculosis, influenza, menorrhagia, fever, burning sensation and skin eruptions.
8	073	<i>Canthium rheedei</i> DC.	Rubiaceae	Edalimaram	S	March – June	Used for whitish ulcers on the surface of a mucous membrane, better for obstructions of the liver, purifies, blood and cheers up the patient.
9	058	<i>Capsicum frutescens</i> L.	Solanaceae	Kantharimul-aku	H	Throughout the year	Used as carminative and rubefacient.
10	274	<i>Cardiospermum helicacabum</i> L.	Sapindaceae	Uzhinja	C	July – February	Whole plant is used for hair growth, rheumatism, glandular swellings, constipation, nervous disorders, piles, chronic bronchitis, fever, hydrocele, sprains and cardiopathy.

11	148	<i>Carica papaya</i> L.	Caricaceae	Pappaya	S	Throughout the year	Fruits, seed, leaf and latex used in hemiplegia, rheumatoid arthritis, anorexia, indigestion, sprue, colic, stomachalgia, dyspepsia, intestinal worms, inflammations, piles, cardiac diseases, oedema, fever, ringworm, skin diseases and leprosy.
12	006	<i>Caryota urens</i> L.	Arecaceae	Aanapana	T	January – April	The leaf bud, seed and toddy are used for diarrhoea, migraine and scorpion-sting poisoning.
13	149	<i>Cassia fistula</i> L.	Caesalpiaceae	Konna	T	February – September	Remedy for skin diseases, leprosy, fever, promotes digestion, leucoderma, eczema, diabetes, cardiac diseases, jaundice, polyuria, and urticaria.
14	150	<i>Cayratia pedata</i> (Lam.) A. Juss. ex Gagnep.	Vitaceae	Veluthasori-valli	C	June – July	Leaf decoction is used to check uterine reflexes. Roots made into a paste and slightly heated are applied on cracked heels.
15	115	<i>Chromolaena odorata</i> (L.) King & Robins.	Asteraceae	Communist-pacha	S	November – May	Leaf juice is applied externally on cuts and wounds to stop bleeding.
16	016	<i>Cissus latifolia</i> Lam.	Vitaceae	Chunnambu-valli	C	June – September	Used for the treatment of burning fever, cough, purifies blood, cure the ulcer of lungs.
17	306	<i>Cleistanthus collinus</i> (Roxb.) Benth. ex Hook. f.	Euphorbiaceae	Odugu	T	December – November	Leaves, roots and fruits act as gastrointestinal irritant. Fruits used for treating cancer.
18	054	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Nilappana	H	June – December	Tuberous roots used in skin troubles, demulcent, diuretic, tonic. Useful in leucorrhoea, urinary diseases, piles, jaundice, asthma, diarrhoea, gonorrhoea, itch and skin diseases.
19	053	<i>Delonix regia</i> (Boj. ex Hook) Rafin.	Caesalpiaceae	Poomaram	T	February – July	Leaves are used for diseases of <i>vata</i> , constipation, inflammations, arthritis, hemiplegia and dysmenorrhoea.
20	055	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Kattukachil	C	September – October	Tubers used for ulcers, piles, leprosy, worm infestation, cardiac diseases, polyuria, urinary calculi, aphrodisiac, rejuvenator, dysentery and syphilis.
21	052	<i>Diploclisia glaucescens</i> (Blume) Diels	Menispermaceae	Vattavalli	C	March – August	Leaf powder with milk given in biliousness, gonorrhoea and syphilis.

22	266	<i>Ficus benghalensis</i> L.	Moraceae	Peraal	T	May – August	Bark is used in skin diseases, cures dysentery, diarrhoea, leucorrhoea, nervous disorders and reduces blood sugar in diabetes.
23	049	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Fabaceae	Seemakonna	T	March – May	Used for headache, cold and cough.
24	050	<i>Gloriosa superba</i> L.	Liliaceae	Menthonni	C	July – December	Tubers used for swelling, piles, oedema, leprosy, cronic ulcers, colic pain in the bladder, itching, antidote against cobra poison; easy and quick expulsion of the placenta after delivery.
25	229	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Panal	S	September – April	Leaf juice used in fever and liver complaints and as a vermifuge. Leaves considered good antidote for inflammations, fever, helminthiasis, cough, bronchitis, rheumatism, jaundice, anaemia, hepatopathy and skin diseases.
26	123	<i>Grewia nervosa</i> (Lour.) Panigrahi	Tiliaceae	Kotta	S	August – April	The plant is used for indigestion, eczema and itch, typhoid fever, dysentery and syphilitic ulceration of the mouth.
27	203	<i>Hemidesmus indicus</i> (L.) R.Br.	Periplocaceae	Nannari	C	August – December	Roots used for cooling and blood purifying action, dyspepsia, dysentery, cough, bronchitis, uterine haemorrhage, wounds, leprosy, blood diseases, anaemia, jaundice, fever, thirst, vomiting, rheumatism and skin diseases.
28	253	<i>Jasminum sambac</i> (L.) Ait.	Oleaceae	Mulla	C	Throughout the year	Roots, leaves and flowers used in ophthalmopathy, pruritus, cephalalgia, otopathy, skin diseases, haemorrhage, wounds, ulcers, fever, itching, headache, vomiting, hiccough and galactorrhea.
29	048	<i>Leea indica</i> (Burm.f.) Merr.	Leeaceae	Chorianthali	S	March – August	Roots used in diarrhoea, dysentery, hyperdipsia, ulcer and skin diseases.
30	095	<i>Macaranga peltata</i> (Roxb.) Muell.-Arg.	Euphorbiaceae	Vatta	T	January – February	Decoction of leaves and bark used as vulnerary. Gum used for venereal sores.
31	211	<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	Euphorbiaceae	Sindooram	T	October – March	Used against tapeworms, abdominal disorders, haemopathy, calculus, flatulence, leprosy, skin diseases and ringworm.

32	206	<i>Merremia vitifolia</i> (Burm. f.) Hall. f.	Convolvulaceae	Manjavayar- avalli	C	November – February	Whole plant used for strangury and urethral discharges. Root eaten by tribals as a stomachic.
33	189	<i>Morinda pubescens</i> J.E. Smith	Rubiaceae	Manjapavitta	T	March – June	It is used for eczema, fever, ulcers, glandular swellings and digestive disorders especially in children.
34	025	<i>Mukia maderaspatana</i> (L.) Roem.	Cucurbitaceae	Kasappuch- edi	C	Throughout the year	Whole plant used for burning sensation, flatulence, constipation, ulcers, cough, neuralgia, odontalgia and vertigo. Fruits used for dysuria, piles, polyuria, tuberculosis and alleviating <i>pitta</i> .
35	085	<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Kariveppu	S	March – July	Juice of roots used for relief from renal pains. Leaves improves voice, stimulates digestion and destroys concocted poisons in the system; skin diseases, worm troubles and neurosis.
36	190	<i>Naravelia zeylanica</i> (L.) DC.	Ranunculaceae	Vathamkodi	C	October – April	Whole plant is used in helminthiasis, dermatopathy, leprosy, rheumatalgia, odontalgia, cephalalgia, inflammations, wounds and ulcers.
37	282	<i>Pedilanthus tithymaloides</i> (L.) Poir.	Euphorbiaceae	Zigzag plant	S	April – August	Wound healing property.
38	045	<i>Phyllanthus amarus</i> Schum. & Thonn.	Euphorbiaceae	Keezharnalli	H	July – October	The plant is used for flu, dropsy, diabetes, jaundice, asthma, bronchial infections, diseases of the liver, stomach, genito-urinary system, liver and kidney. The plant is reported to show antiviral activity against hepatitis B-virus and related hepadna virus.
39	160	<i>Phyllanthus reticulatus</i> Poir. in Lam.	Euphorbiaceae	Neeroli	S	August – December	Bark used in rheumatism, dysentery and venereal diseases. Leaves used for burning sensation, gastropathy, sores, burns, skin eruptions and obesity. Fruits are used in dressing syphilitic sores.
40	307	<i>Physalis angulata</i> L.	Solanaceae	Njottanjod- ian	H	July – December	Roots boiled in water suppresses diabetes, heal sores of mouth. Whole plant used for burning sensation, ulcers, gastropathy, cough and bronchitis.
41	088	<i>Piper longum</i> L.	Piperaceae	Thippali	C	August – January	Roots and fruits are used for improve intellect memory power and regain health by dispelling diseases. It also cures cough, asthma, indigestion, worm troubles, anaemia and chronic fever.

42	009	<i>Pothos scandens</i> L.	Araceae	Paruvakodi	C	October – November	Whole plant is used in skin diseases, boils, swellings, wounds, ulcers, dropsy, menorrhagia, vomiting, flatulence, strangury and burning sensation.
43	042	<i>Putranjiva roxburghii</i> Wall.	Euphorbiaceae	Poothilanji	T	March – August	Leaves and seeds are used for burning sensation, thirst, stomatopathy, ophthalmopathy, constipation, elephantiasis and habitual abortion.
44	181	<i>Schleichera oleosa</i> (Lour.) Oken	Sapindaceae	Poovam	T	March – June	Bark useful in curing ulcers, malaria and inflammations. Seed oil used in leprosy, dermatopathy, boils, ulcers, blood disorders, intermittent fever, snakebite and burns.
45	030	<i>Senna tora</i> (L.) Roxb.	Caesalpiniaceae	Thakara	H	August – December	Leaves and seeds used in ringworm, leprosy, skin diseases, constipation, abdominal disorders, obesity, flatulence helminthiasis and constipation.
46	108	<i>Sida acuta</i> Burm. f.	Malvaceae	Kurumthotti	S	August – October	Used for uropathy, arthritis, leucorrhoea, gonorrhoea, diarrhoea and to promote strength.
47	031	<i>Sida cordifolia</i> L.	Malvaceae	Anakurumthotti	S	Throughout the year	Roots given in urinary troubles, strangury and haematuria, used in combination with asafoetida in hemiplegia, sciatica and facial paralysis (with rock salt). Powdered roots are given with milk in leucorrhoea and frequent micturition. Leaves demulcent and febrifuge; also used in dysentery. Roots are used for rheumatism, headache, neurological disorders, tuberculosis and ophthalmia.
48	090	<i>Streblus asper</i> Lour.	Moraceae	Paruka	T	January – October	Bark, roots and seeds are used for sinusitis, inflammations, elephantiasis, haemorrhages, cough, bronchitis, foul ulcers, diarrhoea, dysentery, fever, swellings, neuralgia and haemorrhages.
49	039	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Kanjiram	C	March – December	Seeds are useful in intermittent fevers, dyspepsia, chronic dysentery, paralytic and neuralgic affections, insomnia, chronic rheumatism, colic, impotence, heart disease, spermatorrhoea and skin diseases.

50	308	<i>Terminalia paniculata</i> Roth	Combretaceae	Maruthu	T	August – February	Bark is a cardio tonic and diuretic.
51	165	<i>Tiliacora acuminata</i> (Poir.) Miers ex Hook. f. & Thomas.	Menispermaceae	Vallikanjiram	C	April – December	Roots are used as an antidote to snake poison.
52	222	<i>Tinospora cordifolia</i> (Willd.) Miers.	Menispermaceae	Chitamruthu	C	January – June	Stems used in fever, jaundice, thirst, burning sensation, diabetes, piles, skin ailments, respiratory disorders, neurological disorders and rheumatism.
53	037	<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Katamruthu	C	February – June	Stems used for treatment of piles and ulcerated wounds, liver complaints, chronic rheumatism and also as muscle relaxant.
54	134	<i>Triumfetta rhomboidea</i> Jacq.	Tiliaceae	Oorpam	S	August – January	Roots used in dysentery, intestinal ulcers and their hot infusion hasten parturition. Bark and leaves used in diarrhoea. Leaves and flowers used in leprosy.
55	138	<i>Urena lobata</i> L.	Malvaceae	Uthiram	S	August – December	Decoction of stem and roots are used in flatulent colic. Flowers are used for cough and sore throat.
56	035	<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Puvankuru- nal	H	Throughout the year	Useful combination with quinine against malaria. Roots used for fever, dysuria, leucorrhoea, excessive bleeding, chronic skin diseases, bladder stones, piles, worms and haematological disorders. The plant juice is good for eyes.
57	184	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Rutaceae	Mullilam	T	March – November	Bark and fruits used in dyspepsia, asthma, bronchitis, heart diseases, toothache, diseases of eye and ear, worm infestation, leprosy, diseases of head and rheumatism. Seeds are used in cholera. Thorns are used in treating pimples.

DISCUSSION

As the study area (Chithalikavu) is near to an all-weather road, passing through its Southern side and there is no compound wall around the sacred grove; various anthropological disturbances are common and these affect the normal growth of natural flora. Floral diversity studies show that regional diversity is well represented in grove system, larger groves often have the relic species of the region and there are frequent changes in floral composition due to various external influences (Khumbongmayum *et al.* 2006, Rao *et al.* 1990). Regeneration of tree species in this area was very poor because of zoo-anthropogenic activities, which also causes the soil erosion and finally decreasing the soil fertility.

Invasive species *Chromolaena odorata* (L.) King & Robins. and *Carica papaya* L. are present inside this grove. Overgrowth of these plants is considered as a threat to the other vegetation of the sacred groves.

Chromolaena odorata is most widely spreading and encroaching species of the similar areas (Cronk & Fuller 1995, Richardson & Rejmánek 2011, Mandal & Joshi 2014a).

Table 2. Phytosociological analysis of major tree species in Chithalikavu.

S.N.	Name of species	D (No./ha)	Ab	F	RD	RF	RBA	IVI
1	<i>Caryota urens</i> L.	37.5	1.5	1.0	0.083	0.182	0.004	0.269
2	<i>Delonix regia</i> (Boj. ex Hook) Rafin.	12.5	1.0	0.5	0.028	0.091	0.003	0.121
3	<i>Ficus benghalensis</i> L.	12.5	1.0	0.5	0.028	0.091	0.515	0.634
4	<i>Putranjiva roxburghii</i> Wall.	12.5	1.0	0.5	0.028	0.091	0.001	0.119
5	<i>Schleichera oleosa</i> (Lour.) Oken	12.5	1.0	0.5	0.028	0.091	0.190	0.309
6	<i>Strychnos nux-vomica</i> L.	325.0	13.0	1.0	0.722	0.182	0.181	1.085
7	<i>Terminalia paniculata</i> Roth	25	1.0	1.0	0.056	0.182	0.101	0.338
8	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	12.5	1.0	0.5	0.028	0.091	0.007	0.125

Note: D- Density, Ab- Abundance, F- Frequency, RD- Relative density, RF- Relative frequency, RBA- Relative basal area, IVI- Importance value index.

CONCLUSION

Groves are important for conservation of biological diversity. Its values and functions can be maintained through effective conservation and management. Almost all species of flora is medicinal inside the grove and used in various systems of medicine. This study shows due to diverse threats the floristic diversity reaches near to its minimum level. Therefore increase in demand to conservation to maintain and increase biodiversity. Local people must become aware of direct benefits of groves and they can learn more about the functions. The above facts focus the aspects of conservation of groves, facing great danger of existence due to loss of sanctity values.

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