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Floristic and Phytosociological Studies of the Sacred Grove, Kayyath Nagam Kavu, Kannur District Kerala, India

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Abstract Religious and traditional beliefs, cultural mores, and practices play a crucial role in the conservation of environment and biodiversity. Sacred groves are patches of land that are communally protected with religious zeal. Kerala is one of the states in India, where the sacred Groves are widely distributed from the West Coast to the Eastern high lands. Most of the sacred groves in Kerala are associated with water tanks, ponds, springs or streams. Many sacred groves are located in catchments near the origins are springs or streams. The present investigation reveals the ethanobotanical and phytosociological attributes of various plant species present in the sacred grove, Kayyath Nagam Kavu, Thaliparamba. 50 vascular plant species were enumerated from the sacred grove. Based on the calculations of frequency, density and abundance, IVI of each species was calculated. Of the various plant species available in the study area, the species *Hopea ponga* secured highest IVI of 32.612. The other species like *Canthium rheedi*, *Scleria lithosperma* were also showing highest IVI. In this site lowest IVI was shown by *Rungia pectinate, Justicia nagpurensis, Jasminum malabaricum, Pongamia pinnata, Mallotus philippensis, Olderlandia auriculata* and *Piper nigrum.*

Keywords: *phytosociological, ethanobotanical, sacred groves, biodiversity, conservation*

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1. Introduction

Conservation of nature and natural resources has been an important part of cultural ethos, especially in remote rural and indigenous communities in many part of the world, including India. These communities consider themselves connected with their biophysical environment in a web of spiritual relationship. These rural communities consider plant, animals or even rivers and mountains as their ancestors and protect them. The sacred groves are the relic forest segments preserved in the name of religion and culture. These groves are mostly associated with temples and are also culturally important. They manifest the spiritual and ecological ethos of rural indigenous communities. Various cultural and religious festivals are often arranged by local people within these patches, which they call 'Mela.' As a way of conservation of nature, sacred groves have proven to be a well-tried and tested method over thousands of years [1].

According to Malhotra *et al.*, [2] groves are those area dedicated by local communities to their ancestral spirits or deities. They have immense value from genetic diversity as well as ecological point of view and rich in flora. They are repository of several medicinal and economically important plants attached with socio-cultural and religious sentiments there exist has undisturbed islands. But today these are adversely affected by human activities. However, such sacred groves are not restricted to India alone. These sacred groves may range in size from a group of few trees to a forest of trees [3]. Groves are important reservoirs of biodiversity, preserving indigenous plant species and serving as asylum of Rare, Endangered and Threatened (RET) species [4]. Even the smallest groves often harbor some olden magnificent specimens of trees and climbers [5]. The larger groves are treasure-trove for the naturalist, supporting many threatening species in the area and the becoming extinct with deforestation. As an ecosystem sacred groves help in soil and water conservation besides preserving biological wealth. But tragically they are slow disappearing under the influence of modernization [6]. There is a recent awakening among the environmentalists to preserve these groves. Some of the sacred groves need immediate attentions; they contain rare and threatening plants. Preservation of these groves is crucial need to this era. Assessment of biodiversity proves extremely practical for determining decreasing natural diversity, effect of exotic species, migration and threat to the species. Many taboos are associated with both the SGs, which help in managing resources well through ritual representation. Sacred groves, in general, are a valuable tool of

biodiversity conservation. But people's changing attitudes, erosion of traditional beliefs, and human impact have caused degradation of sacred groves over the years. Their conservation would not be possible without the active participation of the local people [7].

The ecological processes are well balanced by the influence of biodiversity, which is necessary for human survival. Therefore, the biodiversity-rich sacred groves are of immense ecological significance. They also play an important role in the conservation of flora and fauna. Keeping in view the role of the sacred groves as the treasure of repositories of variety of plant species, the present study is conducted to find out the plant diversity in sacred groves, Kayyath Nagam in Kannur district, Kerala.

2. Materials and Methods

Sree Kayyath Nagam Kavu is one of the keezhadams of Thaliparamba Sree Rajarajeswara Temple under TTK devaswom. This mystic place is located near to Pattuvam, Thaliparamba, Kannur (Figure 1). It is almost 5.1 km away from the Thaliparamba town. This Kavulies between 12.0097° N latitude and 75.3462°E longitude. The climate is moderately hot and temperature ranging from 25°C to 36°C. The total annual rain fall is 3438 mm. This grove is spread over 2 acres with laterate soil. The kavu is a center of beauty and worship for many naturalists and believers.

Figure 1. Sree Kayyath Nagam Kavu, Pattuvam, Thaliparamba, Kannur

Kayyath Nagam temple has got a relevant place among snake temples in north Malabar. This temple is situated in midst of a river and three hills. The primary deity of this temple is Serpent God, Nagaraja.

2.1. Floristic Survey

This study envisages the estimation of floral wealth of the sacred grove and its role in conservation. A brief floristic survey of sacred grove vascular plants was carried out during 2019 to 2020. Plants are identified with the help of Madras Presidency [8], Flora of Cannanore [9] and also by using available field keys and taxonomic bulletins. The identification was further confirmed with the help of taxonomic experts in Botany.

2.2. Phytosociological Analysis

The minimum quadrate size of 1 x 1 was fixed by the species-area curved method of phytosociological observations. Each time 20 quadrats were laid by the randomized method in each site. The minimum number of quadrat required (ie. 10) was determined as described by Greig – Smith [10].

2.2.1. Frequency, Density and Abundance Were Calculated Using the Following Formulae

$$Frequency = \frac{\left(\begin{matrix}Number\ of\ quadrats \\ in\ which\ the\ species\ present\end{matrix}\right)}{Total\ number\ of\ quadrats\ studied} x100$$

$$Density = \frac{\left(\begin{matrix}Total\ number\ of\ individuals \\ of\ the\ species\ in\ all\ quadrats\end{matrix}\right)}{Total\ number\ of\ quadrats\ studied}$$

$$Abundance = \frac{Total\ number\ of\ species\ in\ all\ quadrate}{\left(\begin{matrix}Number\ of\ quadrate \\ of\ occurrence\ of\ species\end{matrix}\right)}$$

$$Basal\ area = \Pi r^2$$

Where,

Π = 3.14 and 'r' is the radius of the stem at the point of emergence.

Relative frequency, relative density and relative dominance were calculated from the following formulae:

$$Relative\ Frequency = \frac{Number\ of\ occurrence\ of\ the\ species}{Number\ of\ occurrence\ of\ all\ species} x100$$

$$Relative\ density = \frac{Number\ of\ individuals\ of\ the\ species}{Number\ of\ individuals\ of\ all\ species} x100$$

$$Relative\ dominance = \frac{Total\ basal\ area\ of\ the\ species}{Total\ basal\ area\ of\ all\ species} x100$$

$$IVI = RD + RF + RDo$$

$$RIVI = IVI / 3$$

3. Result and Discussion

The present work revealed that sacred groves act as a gene pool or preservation plots and many of them harbour rare, endemic, endangered and economically and ethno medicinally very important plants because of the restraints exercised due to the fear of deities/spirits residing in these groves. The most of the groves of present study were small in size. Neglecting the smaller groves will lead to the disappearance of both vegetation and cultural diversity [11].

During study in Kayyath Nagam Kavu, Thaliparamba, a total of 51 vascular plants falling under 50 genera and 32 families were documented. Out of which, the angiosperms dominate with 50 members, while one is Pteridophyte. With respect to their habit, there are 16 herbs, 11 shrubs, 12 trees, 6 climbers, 2 woody climbers, 2 grasses, and 2 epiphytes. Among angiosperms dicots comprises 24 families, 39 genera and 40 species while monocot 7 families, 10genera and 10 species. The relative proportion

of dicot with monocot species are shown in Table 1. The dominant families are Rubiaceae, Asteraceae, Acanthaceae, Fabaceae, Poaceae, Oleaceae with 5,4,4,3,3 and 3 species respectively.

Table 1. Vascular Flora of Kayyath Nagam Kavu, Taliparamba

SL NO.	SPECIES	FAMILY	HABIT	MEDICINAL	COMMON NAME
1	*Abrus pulchellus*Thwaites.	Fabaceae	Herb	Medicinal	Valiyakattumuthira
2	*Acmella ciliata*(Kunth) Cass.	Asteraceae	Herb	Medicinal	Palluvedanachedi
3	*Adenanthera pavonina*L.	Fabaceae	Tree	Medicinal	Manjadimaram
4	*Ageratum conyzoides*L.	Asteraceae	Herb	Medicinal	Kattapa
5	*Aglae eleagnoidea* (A.Juss) Benth	Meliaceae	Tree	Medicinal	Cheeralam
6	*Allopteropsis cimicina* (L.) Stapf	Poaceae	Grass	Medicinal	Venalpullu
7	*Asipidopteris canarensis* Dalz.	Malpighiaceae	climber	Medicinal	Kannaramvalli
8	*Breynea vitis-idaea*(Burm.f.) C.E.C. Fisch.	Phyllanthaceae	Tree	Medicinal	Kattuniruri
9	*Canthium rheedi* D.C.	Rubiaceae	Tree	Medicinal	Edalimaram
10	*Carallia brachiata* (Lour.) Merr.	Rhizophoraceae	Tree	Medicinal & Food	Vanghana
11	*Carryota urens* L.	Arecaceae	Tree	Medicinal	Pana
12	*Chassalia curviflora* (Wall.) Thwaites	Rubiaceae	Sub-shrub	Medicinal	Vellakurinji
13	*Cissus latifolia* Walp.	Vitaceae	Climbing shrub	Medicinal	Chunnambuvalli
14	*Connarus paniculatus* Roxb.	Connaraceae	Climber	Medicinal	Valiyakuril
15	*Cyclea peltata* Hook.f. &Thoms	Menispermaceae	Shrub	Medicinal orchid	Padathaali
16	*Dendrobium ovatum* (L.) Kraenzl	Orchidaceae	Epiphyte	Medicinal	Vellaitthil
17	*Dracaena ternifolia* Roxb.	Asparagaceae	Subshrub	Medicinal	Manjukkantha
18	*Echbolium viride* var. Viride	Acanthaceae	Sub-shrub	Medicinal	Neelambari
19	*Elephantopus scaber L.*	Asteraceae	Herb	Medicinal	Anachuvadi
20	*Ericibe paniculata* Roxb.	Convolvulacaeae	Woody climber	Medicinal	Nakkuvalli
21	*Eupatorium odoratum* L.	Asteraceae	Shrub	Medicinal	Appachappu
22	*Fagraea ceylanica* Thunb.	Genpianaceae	Small tree	Timber	Modakkam
23	*Hopea ponga* (Dennst.)	Dipterocarpaceae	Tree	Medicinal	Kambakam
24	*Hugonia mystax* L.	Linaceae	Climber	Weed	Mothirakanni
25	*Ischaemum ciliare* Retz.	Poaceae	Herb	Medicinal & Food	Chenkodipullu
26	*Ixora coccinia* L.	Rubiaceae	Shrub	Medicinal	Chekki
27	*Jasminum flexile* var.flexile	Oleaceae	Herb	Medicinal	Kaatumulla
28	*Jasminum malabaricum* lawii C.B. Clarke	Oleaceae	Climber	Medicinal	Kaatumulla
29	*Justicia nagpurensis* V.A.W. Grah.	Acanthaceae	Herb	Medicinal	Kattu weed
30	*Lepidagathis incurva* Buch.-Ham .ex Don	Acanthaceae	Herb	Medicinal	Setophuli
31	*Leucas aspera* (Willd.) Link	Lamiaceae	Herb	Medicinal	Thumba
32	*Lindernia caespitosa* (Bl.) Panigrahi	Scrophulariaceae	Herb	Timber	Krishna poo
33	*Macaranga peltata* (Roxb.) Mull.Arg.	Euphorbiaceae	Tree	Medicinal	Uppila
34	*Mallotus philippensis* Muell. Arg.	Euphorbiaceae	Tree	Medicinal	Kumkumamaram
35	*Mimosa pudica* L.(Laajvanti)	Mimosaceae	Herb	Medicinal	Thottavadi
36	*Mussa endafrondosa* L.	Rubiaceae	Shrub	Medicinal	Vellila
37	*Oldenlandia auricularia* (L.) K.Schum.	Rubiaceae	Weedy herb	Medicinal	Getakola
38	*Olea dioica* Roxb.	Oleaceae	Tree	Medicinal	Karivetti
39	*Oplismenus burmannii* (Retz.) P Beauv.	Poaceae	Grass	Medicinal	Vattapullu
40	*Piper nigrum* L.	Piperaceae	Climber	Medicinal	Kurumulakuvalli
41	*Pongamia pinnata* (L.) Pierre	Fabaceae	Tree	Medicinal	Ungu
42	*Pothos scandens* L.	Araceae	Climbing shrub	Medicinal	Anapparuva
43	*Rungia pectinate* (L.) Nees	Acanthaceae	Herb	Medicinal	Tavasmurungi
44	*Scleria lithosperma* (L.) Sw.	Cyperaceae	Herb	Aesthetic value	Nakkpullu
45	*Selaginella roxborghii*var. strigose (Ridl.) K.M. Wong	Selaginellaceae	Herb	Medicinal	Chivothi
46	*Smilax zeylanica* L.	Smilaceae	Climbing shrub	Medicinal	Kaltamara
47	*Strychnos minor* Dennst.	Loganiaceae	Climbing shrub	Medicinal	Cherukaanjravalli
48	*Symphroema involueratum* Roxb.	Lamiaceae	Woody climber	Weed	njarambodal
49	*Urena lobata L.*	Malvaceae	Herb	Medicinal	Uthiram
50	*Uvaria narum* Wall.	Annonaceae	Climber	Medicinal	Korandapazham
51	*Vanda tessellate* (Roxb.) Hook.exG.Don	Orchidaceae	Epiphyte	Medicinal	Maravazha

There are about 11 red listed species in Kayyath Nagam Kavu in which 9 species are least concerned they are *Adenanthera pavonina, Ageratum conyzoides, Aglae eleanoidea, Lindernia caespieitosa, Caryot aurens, Mallotus philippensis, Pongamia pinnata, Scleria lithosperma* and *Vanda tessellate*. *Hopeaponga* is the only a single plant in endangered category and *Aspidopteris cannarensis* is the only one plant in vulnerable category. (Table 3). Red listed species in the study area indicates the conservation status of sacred area. Bhagwat *et al.*, [12] said that the sacred groves are the last home of some endangered species and also are known to represent the only existing climax vegetation communities in Northeastern India. But the area under sacred groves is fast depleting due to the interplay of an array of factors. Sacred groves originally maintained in the form of untouched ecosystems dedicated to the deity are looked as a source of revenue. Role of sacred groves in maintenance of biodiversity is undoubtedly significant. It is very important therefore refresh this traditional establishment and its further conservation [11].

Table 2. Species Composition in Kayyath Nagam Kavu, Taliparamba, Kannur

Si No.	SPECIES	QUANTITATIVE ATTRIBUTES				SYNTHETIC ATTRIBUTES				
		Frequency (%)	Abundance (Individuals/m^2)	Density (Individuals/m^2)	Basel cover (mm^2/m)	R.F (%)	R.D (%)	R.Do (%)	IVI	RIVI
1	*Abrus pulchellus* Thwaites.	10	3	0.3	0.7	1.298	1.2	0.2638	2.762	0.920
2	*Acmella ciliate* (Kunth) Cass.	10	6	0.6	2	1.298	2.4	0.753	4.452	1.484
3	*Adenantherapavonina*L.	10	2	0.2	2.1	1.298	0.8	0.791	2.890	0.963
4	*Ageratum conyzoides*L.	10	16	1.6	1.6	1.298	6.4	0.603	8.301	2.767
5	*Aglae eleagnoidea* (A.Juss) Benth	10	1	0.1	32.5	1.298	0.4	12.250	13.948	4.649
6	*Allopteropsis cimicina* (L.) Stapf	10	1	0.1	3.2	1.298	0.4	1.206	2.904	0.968
7	*Asipidopteris canarensis* Dalz.	40	5	2	2.3	5.194	8	0.866	14.061	4.687
8	*Breyneavitis-idaea* (Burm.f.) C.E.C. Fisch.	10	3	0.3	4.7	1.298	1.2	1.771	4.270	1.423
9	*Canthium rheedi*D.C.	20	1	0.2	37.5	2.597	0.8	14.134	17.532	5.844
10	*Carallia brachiata* (Lour.) Merr.	10	1	0.1	10.3	1.298	0.4	3.882	5.581	1.860
11	*Carryota urens* L.	20	2	0.4	0.9	2.597	1.6	0.339	4.536	1.512
12	*Chassalia curviflora* (Wall.) Thwaites	10	3	0.3	1.7	1.298	1.2	0.640	3.139	1.046
13	*Cissus latifolia*Walp.	20	1.5	0.3	0.9	2.597	1.2	0.339	4.136	1.378
14	*Connarus paniculatus* Roxb.	40	2.25	0.9	1	5.194	3.6	0.376	9.171	3.057
15	*Cyclea peltata* Hook.f. &Thoms	10	5	0.5	1	1.298	2	0.376	3.675	1.225
16	*Dendrobium ovatum*(L.) Kraenzl	10	2	0.2	3.6	1.298	0.8	1.356	3.455	1.151
17	*Dracaena ternifolia*Roxb.	20	1.5	0.3	8.7	2.597	1.2	3.279	7.076	2.358
18	*Echbolium viride*v ar. Viride	10	1	0.1	4.3	1.298	0.4	1.620	3.319	1.106
19	*Elephantopus scaber L.*	10	11	1.1	6.9	1.298	4.4	2.600	8.299	2.766
20	*Ericibe paniculata* Roxb.	10	2	0.2	2.4	1.298	0.8	0.904	3.003	1.001
21	*Eupatorium odoratum*L.	20	4	0.8	6.4	2.597	3.2	2.412	8.209	2.736
22	*Fagraea ceylanica*Thunb.	10	1	0.1	2.7	1.298	0.4	1.017	2.716	0.905
23	*Hopea ponga*(Dennst.)	30	1	0.3	73	3.896	1.2	27.516	32.612	10.870
24	*Hugonia mystax* L.	10	1	0.1	3.8	1.298	0.4	1.432	3.131	1.043
25	*Ischaemum ciliare*Retz.	10	3	0.3	0.6	1.298	1.2	0.226	2.724	0.908
26	*Ixora coccinia* L.	40	4.25	1.7	2.2	5.194	6.8	0.829	12.824	4.274
27	*Jasminum flexile* var.flexile	20	1.5	0.3	2.3	2.597	1.2	0.866	4.664	1.554
28	*Jasminum malabaricum*lawiiC.B.Clarke	10	1	0.1	2	1.298	0.4	0.753	2.452	0.817
29	*Justicia nagpurensis*V.A.W. Grah.	10	2	0.2	0.7	1.298	0.8	0.263	2.362	0.787
30	*Lepidagathis incurva* Buch.-Ham .ex Don	10	5	0.5	0.8	1.298	2	0.301	3.600	1.200
31	*Leucas aspera* (Willd.) Link	10	10	1	1.7	1.298	4	0.640	5.939	1.979
32	*Lindernia caespitosa* (Bl.) Panigrahi	10	6	0.6	0.7	1.298	2.4	0.263	3.962	1.320
33	*Macaranga peltata* (Roxb.) Mull.Arg.	10	2	0.2	1.5	1.298	0.8	0.565	2.664	0.888
34	*Mallotus philippensis* Muell. Arg.	10	2	0.2	1.3	1.298	0.8	0.490	2.588	0.862
35	*Mimosa pudica*L.(Laajvanti)	10	3	0.3	3.9	1.298	1.2	1.470	3.968	1.322
36	*Mussa endafrondosa* L.	20	2	0.4	1.4	2.597	1.6	0.527	4.725	1.575
37	*Oldenlandiaauricularia*(L.) K.Schum.	10	2	0.2	1.3	1.298	0.8	0.490	2.588	0.862
38	*Olea dioica*Roxb.	10	1	0.1	3.6	1.298	0.4	1.356	3.055	1.018
39	*Oplismenus burmannii* (Retz.) P Beauv.	10	8	0.8	0.4	1.298	3.2	0.150	4.649	1.549
40	*Piper nigrum*L.	10	2	0.2	1.3	1.298	0.8	0.490	2.588	0.862
41	*Pongamia pinnata* (L.) Pierre	10	1	0.1	2	1.298	0.4	0.753	2.452	0.817
42	*Pothos scandens* L.	20	3	0.6	2.5	2.597	2.4	0.942	5.939	1.979
43	*Rungia pectinata* (L.) Nees	10	1	0.1	1.2	1.298	0.4	0.452	2.151	0.717
44	*Scleria lithosperma* (L.) Sw.	20	16.5	3.3	2.9	2.597	13.2	1.093	16.890	5.630
45	*Selaginella roxborghii* var. strigose (Ridl.) K.M. Wong	20	2	0.4	0.4	2.597	1.6	0.150	4.348	1.449
46	*Smilax zeylanica* L.	20	1	0.2	1.5	2.597	0.8	0.565	3.962	1.320
47	*Strychnos minor* Dennst.	10	1	0.1	4	1.298	0.4	1.507	3.206	1.068
48	*Symphroema involueratum* Roxb.	10	3	0.3	3.7	1.298	1.2	1.394	3.893	1.297
49	*Urena lobata L.*	20	3	0.6	2.3	2.597	2.4	0.866	5.864	1.954
50	*Uvaria narum* Wall.	30	1.666	0.5	2.4	3.896	2	0.904	6.800	2.266
51	*Vanda tessellata* (Roxb.) Hook.exG.Don	20	3	0.6	2.5	2.597	2.4	0.942	5.939	1.979

Table 3. Red listed plants in Kayyath Nagam Kavu

SI NO	SPECIES	STATUS
1	*Adenanthera pavonina* L.	Least concerned
2	*Ageratum conyzoides*L.	Least concerned
3	*Aglae eleagnoidea* (A.Juss) Benth	Least concerned
4	*Asipidopteris canarensi s*Dalz.	Vulnerable
5	*Caryota urens*L.	Least concerned
6	*Hopea ponga* (Dennst.)	Endangered
7	*Lindernia caespitosa* (Bl.) Panigrahi	Least concerned
8	*Mallotus philippensis* Muell. Arg.	Least concerned
9	*Pongamia pinnata* (L.) Pierre	Least concerned
10	*Scleria lithosperma* (L.) Sw.	Least concerned
11	*Vanda tessellata* (Roxb.)Hook. exG.Don	Least concerned

The quantitative ecological characters such as frequency, abundance, density and basal cover and synthetic characters such as relative frequency, relative density, relative dominance, importance value index and relative value of importance for the study species present in study areas Kayyath Nagam Kavu, Thaliparamba, Kannur is given in Table 2. Phytosociological analysis of a plant community is the first and foremost basis of the study of any piece of vegetation as it is a pre-requisite for the understanding of community structure and organization. For understanding the community structure and organization, species composition is foremost requisite. Species composition is one of the major characters of plant community [13].

Asipidopteris canarensis, *Connarus paniculatus* and *Ixora coccinia* have higher frequency value than rest of the species. Lowest frequency was shown by about 33 species. *Scleria lithosperma* and *Ageratum conyzoides* have distributed abundantly than the other constituent species. Lowest abundance is shown by 14 species.

Based on the basal cover *Hopea ponga* was considered to be dominant species and secured the basal cover of 73mm^2/m. Next to the dominant species, *Hopea ponga*, the species such as *Canthium rheedi*, *Aglae eleagnoidea* were occupied the highest basal cover. *Asipidopteris canarensis*, *Scleria lithosperma* and *Hopea ponga* were registered highest Relative frequency, Relative density and Relative basal cover respectively. The species *Hopea ponga* secured highest IVI of 32.612. The other species like *Canthium rheedi*, *Scleria lithosperma* were also showing highest IVI. In this site lowest IVI was shown by *Rungia pectinate*, *Justicia nagpurensis*, *Jasminum malabaricum*, *Pongamia pinnata*, *Mallotus philippensis*, *Olderlandia auriculata* and *Piper nigrum* (Figure 2). Based on IVI score made by this species it is understood that there are poorly established species in the communities of the study site of sacred grove. Due to endemism, over exploitation, shifting cultivation and other socio economic activities the sacred groves are under threat. Therefore, there is urgent need for conservation and protection of sacred groves before it becomes completely disappear [14,15].

The study revealed that, main driving force behind the disturbance and degradation of the plant species occurs due to human activities. The increasing human interference has changed the structural and functional pattern of the landscape and has influenced the biodiversity significantly [16].

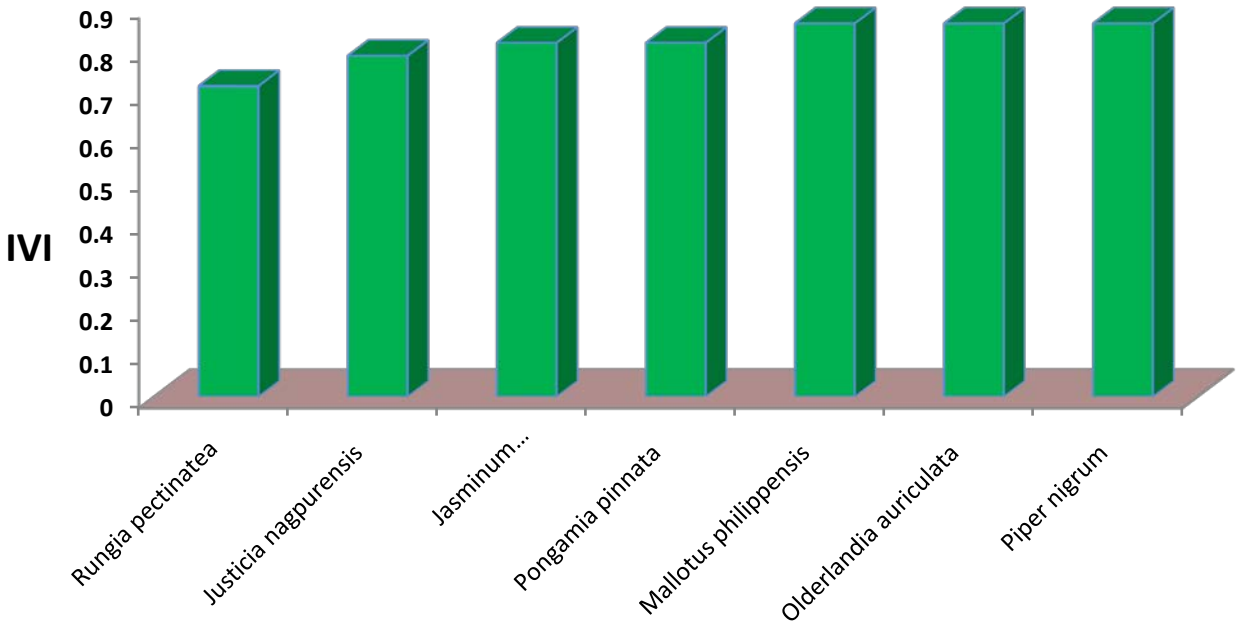

Figure 2. Species composition of KayyamN agamKavu, Taliprambha, Kannur with lowest IVI

The committee members of the Kavu dedicate man power and finance only for the development of shrine. Almost all want to protect this grove only on the basis of religious faith. During high tide, along with water, plastic waste enters into the grove and gets settled there. This is due to the absence of compound wall made with mesh. Snakes are animals that fascinate many people while frightening others. Good or bad, most people have strong feelings about snakes, but few people remain neutral [17]. The Lord Shiva, the god of gods wears a snake around his neck. It is believed that Shiva has given an important place for Nagas. So through these beliefs the Kayyath Nagam Kavu is protected. But some antisocial activities are still exciting there.

4. Conclusion

It is suggested that the studied sacred grove must be given conservation priority to protect valuable endangered medicinal species. Despite the seasonal changes, the anthropogenic were determined to be most influencing factor to affect the species composition and the quantitative ecological attributes of many sensitive species. Therefore construction activities, over grazing, collection of fire wood, tress passing, dumping of waste and many antisocial elements must be checked so as to protect the species in their habitats. Further, ecosystem- specific management plans must be developed to protect the individual species in these sacred groves. Protection of such activities aid in the regulation of ecological processes like energy flow, food chain, food web and cycling of materials which would result in ecological balance and stability of ecosystem.

There is disappearance of the traditional belief systems, which were fundamental to the concept of sacred groves. Thus the degraded sacred grove can be restored only by raising awareness among the rural people regarding the importance of sacred groves and its conservation. Also the local people are encouraged to grow indigenous tree species plantation. There is an urgent need for recognizing these traditionally valued natural systems at various levels and planning for their better management, ultimately aiming to conserve biodiversity. In this context, traditional values that help in conservation should be properly recognized and acknowledged.

In the sacred grove areas organization of awareness campaigns on the functional role is another strategy which also helps to attract more stakeholder groups to participate and jointly chalk out plant to manage and conserve the existing systems in the light of any possible threats like encroachment and habitat destruction in future.

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