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Floristic diversity and phytosociological studies of the selected sacred grove in Kannur district, Kerala

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Abstract
Sacred groves act as a treasure trove for rare and medicinal plants. Apart from the quantitative analysis quantitative approach to sacred grove gives the potential species and importance of sacred grove, which is the main focuses of this work. The quadrate method of sampling was used for the phytosociological analysis of flora of selected sacred grove. The documentation of red listed species were carried out. The potentiality of each species for its medicinal and economic uses indicates the immediate necessity for the conservation of the sacred grove.

Keywords: rare and medicinal plants, Vascular flora of Chama Kavu, Biodiversity

1. Introduction

Sacred groves are relic forest patches protected by local communities in reverence of a deity. These are the representative of climax vegetation and exhibit the diversity of species such as trees, climbers, epiphytes and other shade loving herbs. The groves are not only important sites for regional biodiversity but also provide vital ecosystem services to local people.

One of the most important traditional uses of sacred groves was it acted as a repository for various Ayurvedic medicines. Sacred groves can be used as indicators for potential natural vegetation (Schaaf, 1998) [8] and are vital for well-being of the society. Sacred groves or sacred trees serve as a home for birds and mammals and hence they indirectly help in the conservation of living organisms (Islam *et al*., 1998) [5] Social gathering of people take place in the grove on the occasion of 'Theyyam'. The rituals involve the participation of the entire community (Jayarajan, 2004) [6]. Sacred groves help in soil and water conservation besides preserving biodiversity. The ponds and streams adjoining the groves are perennial water sources and are often the only source for many of the animals and birds that make them their habitat especially during summer.

The main objectives of the study includes analysis of the floristic composition, biodiversity induces, various medicinal uses of documented species, listing out of red listed species, and the conservative strategies for the protection of sacred groves.

2. Materials and methods

Study area

The study area, Chama kavu is concentrated in Kannur district which is located in the Northern part of Kerala. Thekavu lies between 12º09'07.03"N lattitude and 075º12'35. 5" E longitude. The climate is very hot and humid with maximum and minimum temperature ranging from 20°C to 28 ° C. The total annual rain fall is 3438 mm. Earlier the kavu was spread in eight acres of land. Later three acres were given to build a school. Now it has only five acres of land.

Figure showing location Map and study area

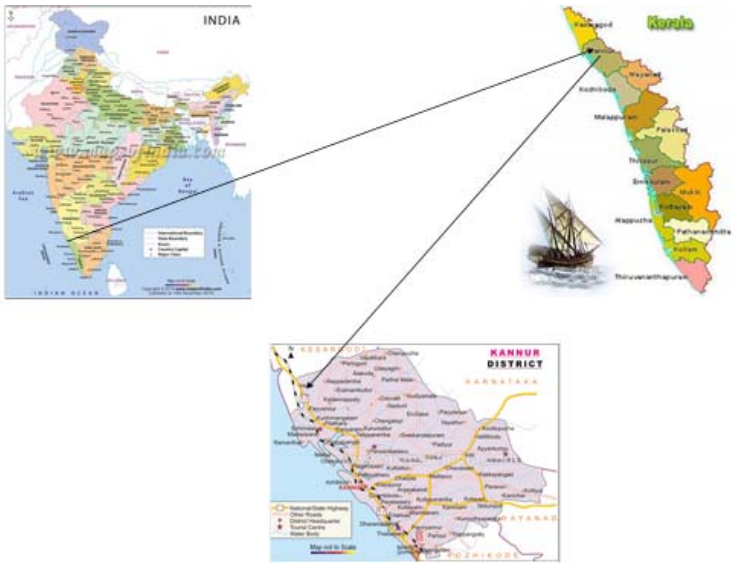

Fig 1: Location map of study area

Fig 2: Study area –Chama Kavu

Floristic Survey
The information about the groves was collected from the local people living around the groves and temple authorities of kavu. During the study, plant species belonging to different families were recorded. Plants were identified with the help of authentic book like Flora of presidency of madras (Gamble, 1935) [3] and consulting with taxonomic experts.

Ethnobotanical studies
During the field visits the various uses of plants were gathered from the older generation in around the grove and referred books and Journals available at the college library. The books include 'Color Atlas of Medicinal Plants' (Edwin Jarnald and Sheeja Edwin Jarnald, 2006) [2], Indian medicinal plants (Varier, 1993)

Phytosociological analysis
The species composition of sacred grove was analysed by count quadrat method by taking 10 quadrates. Frequency, abundance, density, IVI, RIVI were calculated.

3. Results and discussion
Vascular flora of Chama Kavu
During the study, a total of 57 vascular plants falling under 55 genera and 36 families were documented. With respect to their habit, there are 22 trees, 15 shrubs, 13 climbers, 6 herbs and 1 epiphyte. Sacred groves are the representative of climax vegetation and exhibit the diversity of species such as trees, climbers, epiphytes and other shade loving herbs (Bhandaruy and Chandrasekar, 2003) [1]. Among 57 plants, dicot comprises 54 plants and monocot comprises 3 plants that are *Bulbophyllum neilgherrence, Caryota urensand Pothos scandens.* The dominant families are Rubiaceae, Fabaceae, Euphorbiaceae and Verbinaceae with 6, 4, 4 and 3 species respectively.

Ethnobotanical uses of the species in Chama Kavu
Among 57 species in grove 51 species are reported to have various medicinal uses. According to Whittaker (1975) [11] Sacred groves are rich sources and best repository of medicinally important plants. Majority of plants species have the medicinal uses for antidiabetic, skin disease, and jaundice. A few species can be used to control of high blood pressure and anticancerous. *Holigarna arnottiana*J.Hk. Used against cancer *Strychnosnux* – vomica L. used against control of high blood pressure. For various skin diseases the plants used are *Tabernaemontana alternifolia L., Sida acuta* Burm.f.*and Desmodium triuetrum L.*

Biodiversity induces in Chama Kavu
From the calculated value of quantitative attributes of documented plant species, *Chasallia curviflora* occupied higher frequency percentage of 70.According to Nithyadevi and Sivakumar (2015) [7] higher distribution of species is due to their high reproductive capacity and better adaptability to the environment. The less distribution is shown by 19 species with the frequency percentage of 10. Abundance is highest in *Gmelina arborea* of 3 and lowest in *Grewia nervosa* of 0.66. The species *Chasallia curviflora* was registered highest density of 1.9 the lowest density 0.1 was shown by 13 species. *Artocarpus heterophyllus* is considered to be the dominant species in this area as it secured the highest basal cover of 179.14 mm^2/m. *Sida acuta* and *Vernonia sineria* are reported to have lowest basal cover 0f 0.7961 mm^2/m.

Synthetic attributes
Chasallia curviflora registered highest relative frequency and relative density (4.929, 9.097) respectively. The lowest value of relative frequency (0.7042) was reported by 19 species and that of lowest relative density (0.478) was registered by 13 different species in the study area.Relative dominance is higher in *Acacia auriculiformis* of 9.108 and lower in *Sida acuta* of 0.842. Of the various plant species available in the study area, species *Chasallia curviflora secured* higher Importance Value Index (IVI) of 14.324. The lowest IVI was recorded in *Sida acuta*of1.266. The highest Relative Importance Value Index (RIVI) was recorded in *Chasallia curviflora* of4.77. The species of least significance was the *Sida acuta* with RIVI value of 0.422.

Red listed plants in the study area
10 red listed species were identified (IUCN, 2015) [4]. Vartak (1983) reported that sacred groves are the last refuge of endemic, rare and threatened species in the geographical region. Among which the Least concerned species was *Premna serratifolia.* The plants in Endangered category include 4 species, which *are Hopea parviflora, Syzygium caryophyllatum, Vateria indica and Madhuca nerifolia*. *Holigarna arnottiana* belong to Endemic category.Threatenedspecies present in the study area are 3 in number, which are *Actinodaphne malabarica, Phaulopsis imbricatae* and *Tabernaemontana alternifolia*. Only one Vulnerable species present in the grove is *Grewia nervosa.*

Red listed species reported from the selected study area

Actinodaphnemalabarica


Phaulopsis imbricate


Tabernaemonta naalternifolia


Vateria indica


Grewia nervosa


Hopea parviflora


Madhucanerifolia


Syzygium caryophyllatum


Holigarna arnottiana


Premna serratifolia

4. Summary

For the current study Chama Kavu, Kannur area was selected. The main objective of the study was, analysis of floristic diversity, biodiversity induces, various medicinal uses of documented species, listing out of red listed species. To analyze the ecological importance of sacred grove and formulate action plans to conserve sacred grove. In the present study field survey and quadrate method for Phytosociological study were adopted for investigation and interview for socio-economic importance. 57 plants were reported from the study area, of that great majority possesses various medicinal property. Among the 57 plants 10 red listed plants were reported and they harbour various medicinal uses, thereby need to protect the sacred grove is important in this area. The present study envisages to reveal the potentiality for its richness of biodiversity and ecological status of the sacred grove. As an important goal of the current study is to conserve the sacred grove and some of the immediate actions to be taken to ensure the conservation of sacred grove are:

- Preventing the destruction of plants on the basis of developmental activities.
- Shift the position of road and electricity supply that passes through groves.
- Planting the degraded parts of the groves with local species.
- Give effective environmental awareness classes for local people.
- Construct bounds to control soil erosion and to remove the exotic weeds.

5. References

1. Bhandary MJ, Chandrasekar. Sacred groves of Dakhinakanda, Udupi districts of Karnataka, current science, 2003; 85:1655-1656. ISSN: 0011-3891.
2. Edwin Jarnald, Sheeja Edwin Jarald, Colour Atlas of Medicinal plants, 2006.
3. Gamble JS, Fischer CEC. Flora of presidency of madras Adlord, sons Ltd, London: Published under the Authority of the secretary of States of India, in council, 1915-1935, 2017. 1.3:1.
4. International Union of Conservation of Nature IUCN Red listed category, 2015.
5. Islam AKMN, Islam MA, Hoque AE. Species composition of sacred groves, their diversity and conservation in Bangladesh, in Ramakrishnan P S, Saxena K G, Chandrashekara U M, Eds. Conserving

the sacred for biodiversity management. UNESCO and Oxford-IBH Publishing, New Delhi, 1998. 163-165.
6. Jayarajan M. sacred groves of North Malabar. Discussion paper No 92. Kerala Research Programme On local Level Development, 2004. 1-84.
7. Nithyadevi J, Sivakumar R, Phytosociological and ethnomedicinal studies of sacred grove in Konjikuppam village, Cuddalore district, Tamilnadu. International Letters of National Science, 2015; 32:77-81.
8. Schaaf T. sacred groves in Ghana: Experiences from an integrated study project, UNESCO and Oxford-IBH Publishing, New Delhi, 1998.145-150.
9. Vartak V D. Assesment of threatened plants of India BSI, Howrah, 1983. 1-169
10. Varier VPS. Indian Medicinal Plants, 2007.
11. Whittaker RH. Communities and Ecosystems macmillan publishing co. Newyork, 1975.