



Floristic Diversity and Ethnobotanical Studies of Nandha Gopalasamy Hill Temple Sacred Grove of Western Ghats, Pollachi Taluk, Coimbatore

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ABSTRACT

Background: The sacred groves are considered to be ecologically most important area as they are rich in plant diversity. It is considered to be repository of many important medicinal plantspecies including endangered and endemic and many valuable plant species. An ethanobotanical survey was carried out to assess the floristic diversity and it medicinal properties used by the indigenous peoples and local people. The floristic study conducted to understand the status of vegetation an it is important step towards conservation.

Methods: The study was carried out for about one yearby frequent field visit and inperson interview with indigenous peoples to know the medicinal properties of the species.

Result: The study showed presence of 54 medicinal plants out of which 22 are herbs, 12 shrubs, 2 climbers and 17 are tree habits. All the plants are found to be highly medicinal in treating many diseases. The survey reveals the conservation importance of the sacred grove to safe guard the ecosystem for sustainable development.

Key words: Ethnobotany, Medicinal plants, Sacred grove.

INTRODUCTION

Indian subcontinent isaland of rich in biodiversity and cultural heritage with important world biodiversity hotspots. The animal and plant diversity are plays a crucial role in day to day life of humans like religious, spiritual and traditional practices among Indian populations. The civilization is considered to be one of the oldest among the other world civilization which depends upon the plants. The Indian subcontinent has rich number of groves which being considered as sacred based on the traditional and cultural beliefs. The sacred groves are the areas which is conserved by local people and believed to be a treasure house of medicinal, rare and endemic plants, as the centers of seed dispersal (Whittaker 1965). Due to many credits on the diversity and richness these areas are considered as 'mini biosphere reserves' Gadgil and Vartak,(1974).India has the highest concentration of sacred forests in the world with 1,00,000to 1,50,000 sacred forests around the country Malhotra *et al.* (2007). These areas are considered as converging areas of biodiversity and spirituality for the purpose of conservation.

These groves are one of the most valuable, but primitive practices of nature conservation in human civilization. Swamy *et al.* (2003). Ecologically, thesacred groves playan important role in restoring ground water levels, water flow and sedimentation.

For the present study, an important sacred grove called Nandha Gopalaswamy hill temple was selected, located in thefoot hills of Western Ghats, Pollachi Taluk, Coimbatore. The study includes floristic composition and medicinal properties were also documented. The importance of floristic survey and documentation is the first step towards

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conservation.So the present survey has been carried out to perform many conservation practices in the study area.

MATERIALS AND METHODS

Study area

The study area Nandhagopalaswamy hills located in the southern part of Western Ghats of Pollachi, Coimbatore district which is rich in plant diversity including herbs, shrubs and trees. The geographical location of the study area isLat: 10.504944 and Long: 77.01296. The area was considered to be sacred grove for very long years. The temple is situated in a small hillock of Western Ghats surrounded by dry deciduous forest. The area receives very good rainfall during south west monsoon. The grove was covered by many seasonal and perennial streamstoo. It is located about 480 msl approximately and worshipped by the local

people and tribals. The grove is covered by rich medicinal plants including many herbs, shrubs and tall trees.

The sacred grove of the present study Nandha Gopalasamy temple of Southern Western Ghats was spreaded over around 4 acres on the hilly area. The grove was also visited by many peoples and this makes the grove experience many disturbances.

Methodology

The present study was carried out through regular field visit during the year 2018-2019 to explore the floristic composition, medicinal uses of plants and documented from the study sacred groves. The survey was carried out among the indigenous people in the study area respective Nandhagopalasamy sacred grove. The informations gathered by direct interview with the tribals were recorded. A few important plants were processed and herbarium was prepared using standard procedure. The collected plants were identified and authenticated using standard methods Hughes and Chandran, 1998. Photographs of plant specimens and herbarium were also prepared for some specimens and identified using Floras Gamble and Fischer, (1915).

RESULTS AND DISCUSSION

The present study was carried out in the sacred grove Nandha Gopalasamy temple (Fig 5) of Pollachitaluk, Coimbatore district. The grove is considered to be rich in diversity various plant species. A total of 53 species belongs to 28 families have been recorded and tabulated. Out of which 7 species belongs to family Fabaceae followed by 6 families belongs to Malvaceae were with most number of species (Table 3). The sacred grove Nandha Gopalsamy hills was recorded 53 species along with 17 trees, 12 Shrubs, 20 herbs and 2 climbers (Table 2). As per distribution 31.37 percentage trees and 41.17 per cent of herbs has been recorded (Table 1, Fig 4). Some of the important medicinal plants like *Ficus retusa*, *Erythroxylon monogynum*, *Acalypha fruticosa* were also seen.

Based on the medicinal properties and information collected from the indigenous tribal people out of 53 species 18 were administered externally and 35 herbs were administered internally. The study included survey on medicinal plants in all the sacred groves (Fig 6). The medicinal property is also categorized into two major parts. Some of the plants are given internally and some are given

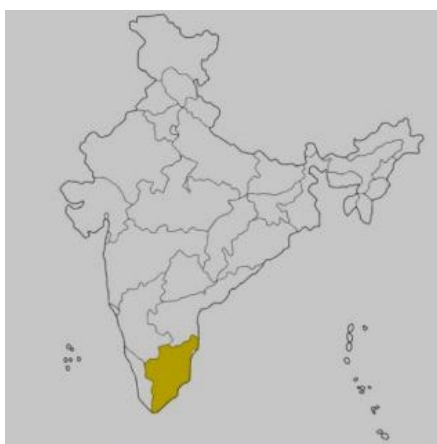


Fig 1: Study area map. India



Fig 3: Nandhagopalasamy sacred grove from Eagle. Eye view

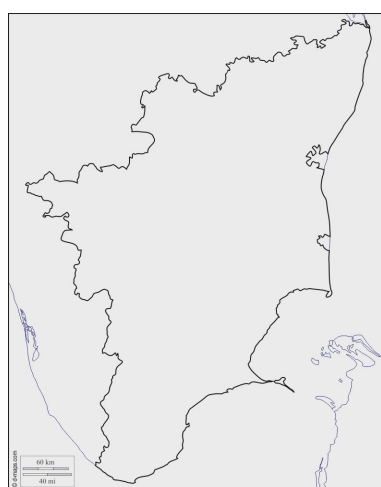


Fig 2: Tamil Nadu map.

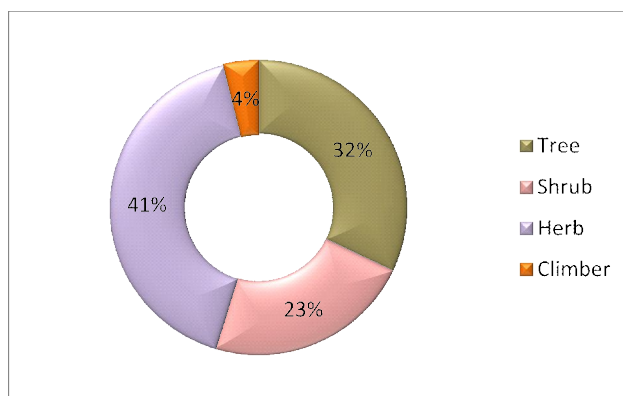


Fig 4: Graphical representation habit-wise distribution of plants found in Nandhagopalasamy sacred grove.

Table 1: Showing list of plant species found in study area Nandhagopalasamy sacred grove with their families, habit and parts used for medicine.

Botanical names	Family	Habit	Plant parts used	Uses
<i>Acalypha indica</i> L.	Euphorbiaceae	Herb	Leaves	Skin diseases
<i>Borreria ocymoides</i> (Burm.f.) DC.	Rubiaceae	Herb	Leaves	Wounds, headache
<i>Catharanthus pusillus</i> (Murr.) G.Don	Apocynaceae	Herb	Leaves	Anti-Diabetic, joint and muscle pain.
<i>Catharanthus roseus</i> (L.) G.Don	Apocynaceae	Herb	Leaves	Dengue fever, asthma
<i>Corchorus trilocularis</i> L.	Malvaceae	Herb	Leaves, root	Reduce swelling, dysentery
<i>Cymbopogon citratus</i> (DC.) Stapf.	Poaceae	Herb	Leaves	Fever, diarrhea
<i>Datura metel</i> L.	Solanaceae	Herb	Leaves	Cholera, skin diseases
<i>Henckelia incana</i> (Vahl.) Spreng.	Gesneriaceae	Herb	Leaves	Skin allergy, fever
<i>Indigofera uniflora</i> Roxb.	Fabaceae	Herb	Leaves	Diarrhoea, urinary complaints.
<i>Justicia procumbens</i> L.	Acanthaceae	Herb	Leaves, root	Asthma, cough
<i>Microstachys chamaelea</i> (L.) Mull.Arg.	Euphorbiaceae	Herb	Leaves, root	Diabetes, desentery
<i>Murdannia nudiflora</i> (L.) Brenan	Commelinaceae	Herb	Leaves	Wound, sores
<i>Ocimum sanctum</i> L.	Lamiaceae	Herb	Leaves	Mouth infection, dengue fever, cold.
<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Herb	Whole plant	Sinusitis, arthritis, cold
<i>Parthenium hysterophorus</i> L.	Asteraceae	Herb	Leaves, flower	Dysentery, urinary tract infection
<i>Peristrophe bicalyculata</i> (Retz.) Nees	Acanthaceae	Herb	Leaves	Eye and ear treatment.
<i>Phyllanthus maderaspatensis</i> L.	Phyllanthaceae	Herb	Root	Diarrhoea
<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Herb	Root	Diabetic, cold
<i>Portulaca tuberosa</i> Roxb.	Portulacaceae	Herb	Leaves	Dry cough, sores.
<i>Pupalia lappacea</i> (L.) Juss.	Amaranthaceae	Herb	Leaves, seed	Diarrhea, Ulcers
<i>Tridax procumbens</i> L.	Asteraceae	Herb	Leaves	Skin diseases, Ulcer
<i>Vernonia cinerea</i> (L.) Less.	Compositae	Herb	Seed	Coughs, skin diseases.
<i>Acalypha fruticosa</i> Forssk.	Euphorbiaceae	Shrub	Leaves	Eye infections, wounds
<i>Crotalaria verrucosa</i> L.	Fabaceae	Shrub	Leaves	Fever, throat, mouth diseases.
<i>Ehretia microphylla</i> Lam.	Boraginaceae	Shrub	Leaves	Cough, colic, diarrhea, dysentery
<i>Flueggea leucopyrus</i> Wild	Phyllanthaceae	Shrub	Leaves	Liver disease and appetizer
<i>Grewia hirsuta</i> Vahl.	Tiliaceae	Shrub	Leaves, root	Spermatorrhoea, cuts Wounds
<i>Hibiscus micranthus</i> L.f.	Malvaceae	Shrub	Leaves	Kidney problem, stomach-ache
<i>Hibiscus surattensis</i> Linn.	Malvaceae	Shrub	Leaves	Tumours, antiinflammatory
<i>Justicia adhatoda</i> L.	Acanthaceae	Shrub	Roots, leaves	Bronchitis, asthma, jaundice.
<i>Ludwigia octovalvis</i> (Jacq.) P.H.Raven	Onagraceae	Shrub	Leaves	Headache
<i>Sida acuta</i> Burm.f.	Malvaceae	Shrub	Leaves, roots	Dysentery, diuretic, fever
<i>Triumfetta rhomboidea</i> Jacq.	Malvaceae	Shrub	Root	Ulcer
<i>Waltheria indica</i> L.	Malvaceae	Shrub	Root	Healing wound, cough
<i>Pterolobium hexapetalum</i> (Roth.) Santapau and Wagh	Fabaceae	Climber	Fruit, seed	Ulcer, piles
<i>Jasminum</i> sp.	Oleaceae	Climber	Leaves	Ulcer
<i>Acacia ferruginea</i> DC.	Mimosaceae	Tree	Roots, leaves	Malaria cough, stomach ache
<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Tree	Fruit, leaf	Dysentery, fever
<i>Albizia amara</i> (Roxb.) Boiv.	Fabaceae	Tree	Leaves, flower, seed	Ulcer, piles, diarrhea
<i>Atalantia monophylla</i> (Roxb.) A. DC.	Rutaceae	Tree	Fruit	Chronic rheumatism
<i>Azadirachta indica</i> A.Juss	Meliaceae	Tree	Leaves, root	Skin problems, chicken box
<i>Bauhinia racemosa</i> Lam.	Fabaceae	Tree	Bark, flower	Piles, skin diseases, ulcer.
<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Tree	Leaves, wood, bark	Scabies, blood disorders, leucoderma
<i>Diospyros montana</i> Roxb.	Ebenaceae	Tree	Leaves, flower	Hypertensive diseases, leucorrhoea
<i>Erythroxylum monogynum</i> Roxb.	Erythroxylaceae	Tree	Leaves	Malaria, jaundice.
<i>Euphorbia antiquorum</i> L.	Euphorbiaceae	Tree	Juice, latex	Nervine diseases.
<i>Ficus retusa</i> L.	Moraceae	Tree	Bark	Liver diseases
<i>Mimusops elengi</i> L.	Sapotaceae	Tree	Leaves, flower	Headache, diarrhoea
<i>Nyctanthes arbortristis</i> L.	Oleaceae	Tree	Leaves, bark	Asthma, piles, hepatomegaly.
<i>Strychnos nux-vomica</i> L.	Loganiaceae	Tree	Seeds	Vomiting, arthritis
<i>Strychnos potatorum</i> L.F.	Loganiaceae	Tree	Seeds	Diarrhea, skin diseases.
<i>Tamarindus indica</i> L.	Fabaceae	Tree	Bark, leaves	Ulcers, throat infection, cough
<i>Wrightia tinctoria</i> (Roxb.) R.Br.	Apocynaceae	Tree	Bark	Kidney stones

externally to treatment diseases. The similar study was conducted previously on sacred groves to assess the medicinal plant resources and centers of key stone species like *Ficus* for conservation of plant species

through various methods (Whittaker, 1965; Jeeva *et al.* 2005; Jeeva *et al.* 2007).

The works of Hemrom and Yadav, 2015 it is agreed with the present study that the preliminary survey on sacred

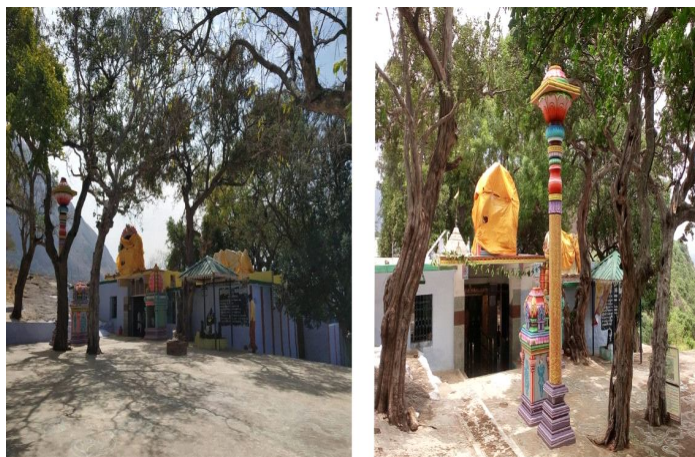


Fig 5: A view of Nandhagopalasamy sacred grove.



Fig 6: Showing some important plants of Nandhagopalasamy sacred grove.

Table 2: Showing habit wise distribution of plant species found in Nandhagopalsamy sacred grove.

Habit	Number of plants	Distribution (%)
Tree	17	32.07
Shrub	12	22.64
Herb	20	41.50
Climber	2	3.77

Table 3: Showing no. of plant species belongs to their respective families in Nandhagopalsamy sacred grove.

Family	No. of species
Acanthaceae	3
Amaranthaceae	1
Apocynaceae	3
Asteraceae	2
Boraginaceae	1
Commelinaceae	1
Compositae	1
Ebenaceae	1
Erythroxylaceae	1
Euphorbiaceae	4
Fabaceae	7
Gesneriaceae	1
Lamiaceae	2
Loganiaceae	2
Malvaceae	6
Meliaceae	1
Mimosaceae	1
Moraceae	1
Oleaceae	2
Onagraceae	1
Phyllanthaceae	3
Poaceae	1
Portulacaceae	1
Rubiaceae	1
Rutaceae	2
Sapotaceae	1
Solanaceae	1
Tiliaceae	1
Total	53

groves insists importance on cultural and social criteria of a community. It is also found that unique vegetation and found components dedicated to local deities. The study on sacred grove vegetation indicates the pre-existence of climax vegetation in the area (Gadgil and Vartak 1974). The present survey also showed that herbs are more dominant followed trees and shrubs respectively. The floristic distribution of sacred grove was not similar throughout the study area. There are many variability in the forms were also noted due to diverse climatic and light intensity received by the vegetation. The view very much accepted by previous workers Sukumaran *et al.* (2018) and Drude, (1980). They emphasized the dependency of life forms due to climate, adaptation of plant to the environment and even the primary and micro climate. The works of Meher Homji 1974 justified that present study as plant life forms are related to the

environment conditions the biological spectrum denotes the existing environment in a ecosystem. It is also found that the most dominated family is Malvaceae followed by other families are also reported. The present survey clearly depicts that grove is most important due to its floristic diversity and also plants with rich medicinal properties. It is also necessary to reduce the anthropological pressures to conserve the flora of the sacred grove. The conservation measures may be implemented in the form of *in situ* and *ex situ* conservation. The present documentation work will be very useful to conserve traditional knowledge Patwardhan, 2021. Carefully designed ecotourism initiatives (centered on sacred groves), where culturally appropriate and traditional health care systems integrated along with careful commercialization of traditional food systems can form a viable example of incentive based conservation approach.

CONCLUSION

The study clearly showed that Nandha Gopalsamy hill temple of Pollachi Taluk located in Southern Western Ghats rich in floristic diversity including many herbs, shrubs and tree components. The present survey showed that 53 plant species with medicinally important and few key stone species. The study also reveals the medicinal plants used by the indigenous and local people and also anthropological pressures on wild plants. Floristic inventory and diversity status help us understand the species composition and diversity status of forests. The area should be taken care as much as possible to conserve the plant diversity and ultimately the forest. The present documentation work will be very useful to conserve traditional knowledge. The present work will be a good resource to those who pursue the research on biological science and the study gains its importance towards declaring such areas as Community conserved areas under Biodiversity act.

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