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Survey of medicinal and anticancer plants from Vengad Sree Kurumba Kavu sacred grove, Kannur Kerala

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Abstract

A total 47 Medicinal plants from 33 families, 9 anti-Cancerous plants have been found in Vengad Sree Kurumba Kavu Sacred grove. It includes 14 Trees, 5 Shrubs, 25 Herbs and 7 Climbers. Different parts of plants like leaves, root, seeds, flowers etc are being used for curing different diseases. The plants like *Annona squamosa*, *Ocimum sanctum*, *Azadiracta indica*, *Bauhinia purpurea*, *Ixora coccinea*, *Terminalia catappa*, *Euphorbia hirta* and *Psidium guajava* are used for the treatment of cancer, because of the presence of anti-oxidants and other compounds.

Keywords: Sacred grove, medicinal plants, cancer, antioxidant.

Introduction

Sacred groves are tracts of virgin forest harbouring rich biodiversity and are protected by local communities to keep them in a relatively undisturbed state. These are the small patches of relic forest, protected by local communities on religious ground, which are the traditional Indian way of in situ conservation of biodiversity. Various indigenous communities dedicate sacred groves to the local deities or ancestral spirits. Such a grove may consist of a multi-species, multi-tier primary forest or a cluster of trees, depending on the history of the vegetation. These groves were protected by local communities, usually through customary taboos and sanctions with cultural and ecological implications.

In such groves many medicinal plants were in use in the past as home remedies. But now home remedies are nearly non-existent. Several medicinal plants are used by Ayurvedic practitioners to prepare medicines that are commercially important. This survey has also revealed that some informations about such medicinal plants. Now most of the herbal raw materials for ayurvedic preparations come from outside of the villages (Sreedharan 2004) [10].

Cancer has been defined as a disease in which there is uncontrolled multiplication and spread within the body of abnormal forms of the body's own cells. All cancer types arise through a series of steps characterized by progressive loss of normal growth control. There are proteins in the cells that ensure this continuity. Death from cancer often comes not from the primary site but from metastases. Cancer may affect people at all ages even foetus but the risk for most varieties increases with age. Thousands of herbal and traditional compounds are being screened worldwide to validate their use as anticancerous drugs.

Despite the long history of cancer treatment using herbal remedies in the study area, the knowledge and experience of these herbalists have not been scientifically documented. Information on traditional herbal practice is passed from one generation to the other through oral tradition. Considering the rapid rate of deforestation and loss of biodiversity, there is a need for accurate scientific documentation of the knowledge and experience of these herbalists. In this paper, we report the information on plants gathered from traditional and elder rural dwellers, used in the study area for the treatment of cancer. In this paper we report information on the medicinal plants have anticancerous activity.

Materials and Methods

Study Area

The study area is Vengad Sree Kurumba Kavu, the grove is located in Vengad Panchayath, nearly 21km away from Kannur. The grove is situated around 2 acre.

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Geographically, it is lying between 11°52'N latitude and 75°25'E longitude. Temperature is maximum 35 °C and minimum 20 °C. Annual rainfall is 3438 mm. Most of the rains occur south-west monsoon. The vegetation of Vegad Sree Kurumba Kavu Sacred groves is very high.

Methodology

In that grove mentioned the important medicinal plants present and their uses. Identification of plants was done on the basis of spot identifications. More information's are collected from village headmen, local people, educated persons and care takers of sacred groves. The field visit was conducted several times and ethnobotanical information was collected and such as part of the plant used in medicinal purpose and the anti-cancerous plants present in sacred grove. Photograph were also taken. The plants are identified with the help of Flora of Presidency of Madras. Identify the anti-cancerous plants present in that sacred grove on the basis of various books and research work published by different authors. Further confirmation was made by comparing the data's and make a conclusion about the role of sacred groves in conserving biodiversity.

Result and Discussion

During the study, Forty seven plants belonging to 33 families under 47 species are traditional folklore medicinal plants. Plants are enumerated with botanical names, local names (Tamil), family, and use of different plant part in various ailments (Table 1). Euphorbiaceae was the dominant family with 5 species, followed by Asteraceae (4species) and Fabaceae (3 species), 10 families represented by two species and 21 families represented single species. The table 2 showing the medicinal plants in habit wise, herbs played a dominating role that is 49.01% as compared to other plant habits (Figure 1). The following figure: 1 showing percentage of medicinal plants in habit wise. The table 3 showing medicinal plant parts used and its percentage, as compared to the other plant parts percentage. The whole plant part percentage shows high percentage that is 43.13% (Figure 2).

Out of these 47 medicinal plants 9 plants are *Annona squamosa*, *Bauhinia purpurea*, *Ixora coccinea*, *Terminalia catappa*, *Euphorbia hirta* *Jasminum grandiflorum*, *Azadiracta indica*, *Psidium guajava*, *Ocimum sanctum* have anti-cancerous activity. Similar studies have been done by Umadevi *et al.*, (2013) [11] and reported that the anti-cancer activity of medicinal plants is due to the presence of antioxidants in them and also revealed about the plants used for Cancer treatment which include the plants species *Curcuma zedoaria*, *Typhonium flagelliforme*, *Catharanthus roseus*, *Azadirachta indica*, *Tinospora cordifolia*, *Ocimum sanctum* etc.

In *Euphorbia hirta* preliminary phytochemical screening showed the presence of alkaloids, steroids and flavonoids (Sandeep *et al.*, 2011) [9]. Results of in vivo anti-tumor activity suggested that the isolated flavonoids may have a chemo preventative role in cancer through their effects on signal transduction in cell proliferation and angiogenesis.

Similar study was carried out by Naitik *et al.*, (2013) [5] Anti-tumor and anti-oxidant status of *Terminalia catappa*. The phenolic and flavonoid components in this extract may be responsible for antitumor activity.

Chen *et al.*, (2012) [2] studied that the Anti-tumor activity of *Annona squamosa* and *Psidium guajava* the studies revealed that *Annona squamosa* seed extract showed significant anti-tumor activities against human hepatoma cells in vitro and in vivo indicating a potential for developing the extract as a novel

anti-liver cancer drug. The extract from guava leaves can serve as both a chemopreventive and a chemotherapeutic agent. Guava is a potential source of compounds associated with the prevention and treatment of cancer.

The ethanolic extract of *Jasminum grandiflorum* flower to have a potent (100%) chemopreventive efficiency in experimental mammary carcinogenesis in vivo (Kolanjiappan and Manoharan 2005) [3].

In *Bauhinia purpurea* Linn. preliminary studies shows that Cyanidin glucoside, malvid glucoside, peonidin glucoside and kaempferol galactoside isolated from these species inhibit growth and spread of various cancers such as breast, lung, liver, oral cavity, larynx and malignant ascites (Petti *et al.*, 2006) [8].

In *Ixora coccinea* preliminary studies carried out the studies revealed that *Ixora coccinea* L. flower have a capacity to inhibit tumor (Latha and Panikkar 1998) [4].

1. Plant name: *Annona squamosa* L.

Common name: Attichakka, Atti

The *Annona squamosa* (Plate 1) is belongs to Annonaceae family. The seeds of *Annona squamosa* have been used in the south of china as folk remedy to treat Malignant sores (cancer). The seed extract showed significant anti-tumor activity against four human tumor cell lines. (Chen *et al.*, 2012) [2].

2. Plant name: *Bauhinia purpurea* Linn.

Common name: Mandaram

The genus *Bauhinia* (Plate 1), a member of family Caesalpiniaceae, comprises of trees and shrubs that grow in warm climate. The preparation of extracts from the various parts of *Bauhinia purpurea* leaves, stems, roots and pods is used as cancer cell growth inhibitors. The other species of *Bauhinia* such as *Bauhinia variegata* also shows anti-cancerous property. Cyanidin glucoside, malvid glucoside, peonidin glucoside and kaempferol galactoside isolated from these species inhibit growth and spread of various cancers such as breast, lung, liver, oral cavity, larynx and malignant ascites (Petti *et al.*, 2006) [8].

3. Plant Name: *Ixora coccinea* L.

Common name: Chekki

Ixora coccinea (Plate 1) a member of family Rubiaceae comprises shrub and small tree. In a report cytotoxic and anti-tumor principles from *Ixora coccinea* flowers published in "Cancer Letters" 1998 the antitumor activity of *Ixora coccinea* L. (ascetic and solid tumor) and carcinoma tumors in mice (Latha and Panikkar 1998) [4].

4. Plant Name: *Terminalia catappa* L.

Common name: Badam

Terminalia catappa (Plate 1) is found throughout the warmer parts of India. The various extract of leaves and bark of the plant have been reported to have anticancer, antioxidant. A polyphenolic flavonoid isolated from milk thistle has shown to inhibit the lung cancer metastasis. The content of potential antioxidants compounds like phenolic and flavonoid may responsible for anti-tumor activity (Naitik *et al.*, 2013) [5].

5. Plant Name: *Euphorbia hirta* L.

Common name: Chara, amampatchaiaraisi

Euphorbia hirta L. (Plate 2) family Euphorbiaceae is a small herb, which grows throughout the hotter part of India. Anti-tumor activity of *Euphorbia hirta* has been evaluated against EL-4 cell line swiss albino mice. A significant enhancement of

mean survival time and reduction of solid tumor mass of *Euphorbia hirta* treated tumor bearing mice was found with respect to control group due to the presence of flavonoids (Sandeep *et al.*, 2011) [9].

6. Plant Name: *Jasminum grandiflorum* L.

Common name: Mulla

Jasminum (Plate 2) is plant, its flower is used to make medicine. The ethanolic extract of *Jasminum grandiflorum* flower to have a potent (100%) chemopreventive efficiency in experimental mammary carcinogenesis in vivo. This is a very strong indicator for possible use as a breast cancer preventive herbal remedy (Kolanjiappan and Manoharan 2005) [3].

7. Plant Name: *Azadiracta indica* A. Juss.

Common name: Neem, Veppu

Neem (Plate 2) is a member of Meliaceae family is a fast growing tropical evergreen tree. Over 60 different types of biochemical's including terpenoids and steroids have been extracted from this plant. The components extracted from leaves show chemopreventive and antitumor effects in different types of cancer. Two bioactive components in Neem azadirachtin and nimbolide, have been studied extensively. The key anticancer effects of Neem include inhibition of cell proliferation, induction of cell death, suppression of cancer angiogenesis restoration of cellular reduction/oxidation, oxidation balance and enhancement of host immune responsive against tumor cell. These effects are tumor selective as the effects on normal cells are much less (Paul *et al.*, 2011) [7].

8. Plant Name: *Psidium guajava* Linn.

Common name: Pera

A study from Kyung Hee University, Seoul, Korea had identified D-glucuronic acid, quercetin 3-glucuronide, loganin, and xanthyletin from the butanol fraction of guava leaf extract. The researchers of this study concluded that guava leaves could reduce lung cancer cell metastasis and that the fraction

from guava leaves can suppress the expression and activity of matrix metalloproteinase-9 and metalloproteinase-2 by down regulating ERK1/2 activation in lung cancer cells (Chen *et al.*, 2012) [2].

9. Plant Name: *Ocimum sanctum* L.

Common name: Vella tulasi

Ocimum sanctum (Plate 2) contains eugenol, linolenic acid and flavonoids such as orientin, vicenin, cirsilineol, cirsimaritin, isothymusin, isothymonin and apigenin. The plant shows immune enhancing and tissue-protective properties. Polysaccharides isolated from *Ocimum sanctum* have antioxidant and radioprotective properties. *Ocimum sanctum* protect against various cancers particularly the breast cancer and reduces side effects of chemotherapy and radiotherapy (Umadevi *et al.*, 2013) [11].

Conclusion

A survey conducted on medicinal plants in Vengad Sree Kurumba Kavu Sacred Grove, Kannur Kerala 47 plant species were used for treating a number of diseases. Most plants were used to treat more than one medical condition. It includes 14 Trees, 5 Shrubs, 25 Herbs and 7 Climbers. Different parts of plants like leaves, root, seeds, flowers etc are being used for curing different diseases. The plants like *Annona squamosa*, *Ocimum sanctum*, *Azadiracta indica*, *Bauhinia purpurea*, *Ixora coccinea*, *Terminalia catappa*, *Euphorbia hirta* and *Psidium guajava* are used for the treatment of cancer, because of the presence of anti-oxidants and other compounds. Now we realize that sacred groves are filled with herbal medicines for curing diseases and they are precious.

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Table 1

S. No	Plant Name	Family	Parts Used	Medicinal Used
1.	<i>Acacia auriculiformis</i> A. cunn. ex Benth	Fabaceae	Seed	Spermicidal and anti HIV properties.
2.	<i>Adhatoda vasica</i> L.	Acanthaceae	Leaf	Sidha, Ayurvedic and Unani system of medicine to cure various diseases.
3	<i>Aegle marmelos</i> Corv.	Rutaceae	Whole plant	Digestive, stomach ache, thirst, stomach pain, night fever, intestinal diseases
4	<i>Aerva lanata</i> (L.) Juss. ex Schult	Amaranthaceae	Whole plant	Snake- bite
5	<i>Anacardium occidentale</i> L.	Anacardiaceae	Seed, Cashew shell, PuLP	Snake-bite, dental cavities
6	<i>Annona squamosa</i> L.	Annonaceae	Whole plant	Diarrhoea, dysentery, cough, malignant tumors
7.	<i>Abrus precatorius</i> L.	Fabaceae	Leaf, root, seed	Wounds and scratches created by pet animals.
8.	<i>Azadiracta indica</i> A. Juss.	Meliaceae	Whole plant	Cough, asthma, phantom tumor, leprosy, eye problem, epistaxis, intestinal worms, skin ulcers
9.	<i>Bauhinia purpurea</i> Linn.	Caesalpiniaceae	Bark, leaf	Ulcers, wounds, swollen glands and stomach tumors.
10	<i>Biophytum sensitivum</i> Linn.	Oxalidaceae	Whole plant	Snake-bite
11	<i>Boerhaavia diffusa</i> L.	Nyctaginaceae	Whole plant	Diabetics, jaundice, gonorrhoea, sores, swelling, Itchiness and chronic dysentery.
12	<i>Cassia fistula</i> Linn.	Caesalpiniaceae	Root, pulp, leaves	Skin irritation rheumatism
13	<i>Centella asiatica</i> L.	Apiaceae	Whole plant	Fever and common cold
14	<i>Citrus auratifolia</i> L.	Rutaceae	Fruit, leaf	Diarrhea, low pressure patients
15	<i>Clitoria ternate</i> Linn.	Fabaceae	Whole plant	Cold, asthma and small pox.
16	<i>Commelina communis</i> L.	Commelinaceae	Leaf	Anti-pyretic, anti-inflammatory and diuretic effect.
17	<i>Crotalaria spp.</i> Linn.	Leguminosae	Whole plant	Kapha, Vata, cough, dyspepsia, fever, skin infection constipation

				and pain.
18	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Whole plant	Skin disease, diabetes, urinary tract infections, blood disorders, anti-microbial and antiviral properties.
19	<i>Eclipta prostrata</i> (L.)L.	Asteraceae	Whole plant	Jaundice, fatty liver, hemorrhoids, urinary infection cough, lung infection.
20	<i>Emilia sonchifolia</i> Linn.	Asteraceae	Whole plant	Vata, diarrhea, ophthalmia, cuts, wounds, intermittent fever and asthma
21	<i>Euphorbia heterophylla</i> L.	Euphorbiaceae	Leaf	Wound, skin diseases
22	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Whole plant	Respiratory disorder, worm infestations in dysentery, jaundice, pimples, gonorrhoea, digestive problems and tumors.
23	<i>Evolvulus alsinoides</i>	Convolvulaceae	Whole plant	Purify blood and also improve memory power
24	<i>Ficus religiosa</i> Linn.	Moraceae	Leaves, Bark, Seed	Bone fractures, glandular diseases etc
25	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Leaves, Flowe, Root	Blood circulation, flower extract has been traditionally used for liver disorders, high blood pressure
26	<i>Ixora coccinea</i> L.	Rubiaceae	Leaves, Flower	Wounds, skin ulcers, sore throat, Bronchitis cough, Asthma and Tumor.
27	<i>Ipomea sepiaria</i> Roxb.	Convolvulaceae	Root	viper bite
28	<i>Jasminum grandiflorum</i> L.	Oleaceae	Flower	Liver disease, dysentery, mendel alertness treatment and tumor
29	<i>Leucas aspera</i> Willd	Lamiaceae	Whole plant	Nasal congestion, cold, head ache, fever
30	<i>Menispermum canadense</i> L	Menispermaceae	Root	Skin diseases.
31	<i>Michelia champaca</i> L.	Magnoliaceae	Bark, Flower, Root	Skin diseases. Root bark is purgative, used in amenorrhoea,
32	<i>Mimosa pudica</i> L	Mimosaceae	Leaf	Cure wounds
33	<i>Myristica fragrans</i> Hout	Myristicaceae	Leaves	Snake bite, stomach ache
34	<i>Ocimum sanctum</i> L.	Lamiaceae	Whole plant	Fever, common cold and cough and Tumor
35	<i>Panicum maximum</i> Jacq.	Poaceae	Whole plant	Antimalarial and analgesic activity
36	<i>Phyllanthus amarus</i> Shum & Thonn	Euphorbiaceae	Whole plant	Diabetes, hepatitis B
37	<i>Phyllanthus niruri</i> L.	Euphorbiaceae	Whole plant	Jaundice, stomach and genitourinary system, liver, kidney, spleen
38	<i>Piper nigrum</i> L	Piperaceae	Fruit, leaves	Cold, fever and dysentery
39	<i>Piper longum</i> L.	Piperaceae	Fruit	Fever, common cold
40	<i>Psidium guajava</i> Linn	Myrtaceae	Root, Fruit	Haemorrhages, diarrhea, dysentery, especially children, ulcers, vomiting
41	<i>Scoparia dulcis</i> L	Scrophulariaceae	Whole plant	Diabetics, hypertension, hemorrhoids and wound, sickle cell disease.
42	<i>Sesamum indicum</i> L.	Pedaliaceae	Flower	Flavonoids and saponins which shows some medicinal properties.
43	<i>Sida cordifolia</i> L	Malvaceae	Root	Asthmatic bronchitis, nasal congestion and ulcer
44	<i>Strychnos nux-vomica</i> Linn	Loganiaceae	Leaf	snake -bite
45	<i>Tecoma stans</i> (L.) Juss. ex Kunth.	Bignoniaceae	Leaf	Anti-bacterial activity
46	<i>Terminalia catappa</i> L	Combretaceae	Leaves, Fruit	Liver disease, prevention of cancers
47	<i>Tridax procubens</i> L.	Asteraceae	Whole plant	Pitta, ulcers and anal fistula

Table 2: Percentage of Medicinal Plants In Habitwise

SI No	Habit	Number	Percentage
1	Trees	14	27.45%
2	Shrubs	5	9.80%
3	Herbs	25	49.01%
4	Climbers	7	13.72%

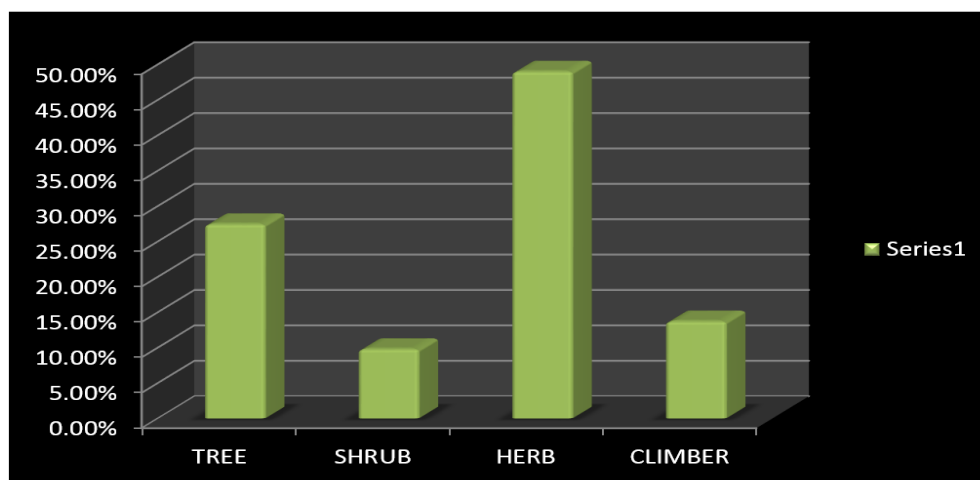


Fig 1: Percentage of Medicinal Plants In Habitwise

Table 3: Medicinal Plant Parts Used and Its Percentage

Plant Part Used	Number	Percentage
Leaf	9	17.64
Seed	2	3.92
Root	3	5.88
Flower	2	3.92
More Than One Part	13	23.52
Whole Plant	22	43.13

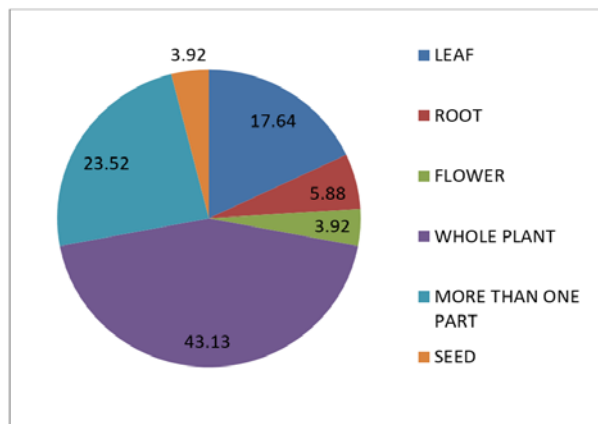


Fig 2: Diagrammatic Representation of Medicinal Plant Parts Used and It's Percentage



Azadirachta indica A. Juss.

Psidium guajava Linn.



Ocimum sanctum L.

Plate 2



Annona squamosa

Bauhinia purpurea



Ixora coccinea L.

Terminalia catappa L.

Plate 1: Anti-Cancerous Plants Present In Vengad Sree Kurumba Kavu Sacred Grove



Euphorbia hirta L.

Jasminum grandiflorum L.

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