

# RARE AND ENDEMIC PLANTS IN THE SACRED GROVES OF KANYAKUMARI DISTRICT IN TAMIL NADU

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**Abstract:** During the present study, a total number of 201 sacred groves were enumerated in Kanyakumari District and reported 329 plant species belongs to 251 genera under 110 families. Among the 329 species, 12 species of shrubs, herbs and climbers are listed as rare, endemic and threatened, belonging to 12 genera under eleven families. Species like, *Alpinia galanga*, *Gloriosa superba*, *Hemidesmus indicus*, *Kaempferia galanga* and *Rauvolfia serpentina* are endangered and threatened, *Justicia beddomei*, *Leea indica* and *Petiveria alliacea* are rare, *Indigofera uniflora*, *Naregamia alata*, *Ochlandra scriptoria* and *Osbeckia aspera* var. *wightiana* are endemic to sacred groves of Kanyakumari District.

## INTRODUCTION

Sacred groves have close linkage with the ecology of the place. These are representatives of the relic climax vegetation of Indian sub-continent and part of the socio- cultural traditions (Sukumaran, 2002). Protection of environment and life supporting system is intricately interwoven with the conservation of biological diversity. The spreading of eco-consciousness everywhere and the role played by various agencies to promote this have partially succeeded, in creating a new culture which considers deforestation and destruction of ecosystem as almost a sin. These groves exist in several states of India in various names, in Tamil they are known as 'Iyarkaikovilkal'. All forms of vegetation are conserved including trees, shrubs, herbs and climbers (Gadgil and Vartak, 1976).

Sacred groves are tracts of virgin forests, the vestiges of an ancient practice in which people protected forest patches to avoid the perceived wrath of its resident Gods. These sanctuaries of rare, endangered and endemic plants combined with other biotic and abiotic components represent a unique example of the all embracing concept and practice of Indian way of *in situ* conservation and protection of environment. The 'Iyarkaikovilkal' of Kanyakumari District are distinct and unique in their biological

diversity and ecosystem functioning. Some of these forests are still undisturbed, although their majority is in different stages of degradation. These groves are rich and dense with trees, shrubs, herbs, lianas, epiphytes, climbers and twiners and supports a wide range of local biodiversity (Gadgil and Vartak, 1975, 1976, 1981; Haridasan and Rao, 1985, 1987; Raj, 1993; Rajendrapradad *et al.*, 1998, 2000; Sukumaran, 2002) and they preserve many rare endemic and endangered species, many of which hold potential use to man (Sukumaran and Raj, 1999; Sukumaran *et al.*, 2005; Ramanujam and Cyril, 2003; Upadhaya *et al.*, 2003; Mishra *et al.*, 2004).

Some of the groves have been studied for their floristic composition in other parts of Tamil Nadu (Visalakshi, 1995). In Kanyakumari District floristic structure of 40 sacred groves have been reported recently (Sukumaran *et al.*, 2005). Climax vegetation in sacred groves of this district is rich in their species composition. It is, therefore to survey sacred groves and properly assess their role in nature conservation (Gadgil and Vartak, 1975). Since most of the sacred groves are located near human settlements, human disturbances in these forests are progressively increasing. A survey of 201 sacred groves in this District by Sukumaran (2002) indicate that, 329 species distributed four different taluks, of which 46 species endemic to the Western Ghats and Southern

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Western Ghats. These observations prompted the authors to undertake the present study. This paper is an attempt to highlight the uniqueness of vegetation and the occurrence of rare, endemic and threatened (RET) herbs, shrubs and climbers of sacred groves of Kanyakumari District.

## MATERIALS AND METHODS

Floristic composition of each grove was analysed during field visits spreaded over different seasons. Flowering twigs were collected and identified taxonomically using the publication of Gamble and Fischer (1957) and Nair and Henry (1983, 1987 and 1989). The prepared herbarium were verified from the Kerala Forest Research Institute and Botanical Survey of India, Coimbatore. The voucher specimens were processed in the customary way and deposited in the herbarium of Department of Botany, Scott Christian College, Nagercoil. Medicinal value information were gathered by interviewed from the local users and recorded in audio taps. RET (Rare, Endemic and Threatened) species were listed with the help of standard publications such as IUCN Red Data Book (1980), Ahamedullah and Nayar (1986), Nayar and Sastry (1987-1990), Nayar (1996) and Sukumaran and Raj (2007).

## RESULTS AND DISCUSSION

Sacred groves are thickly wooded with one or more large or small trees, variety of lianas, shrubs, herbs, climbers and twiners, pteridophytes, bryophytes, micro and macro algae, fungi, lichens and fauna associated with them. During the floristic exploration, a total of 201 Sacred groves distributed in four different taluks. They are 108 from Vilavancode taluk, 72 in Kalkulam, 11 in Thovalai and 10 in Agastheswaram (Fig.1). Among 329 plant species from 251 genera belonging to 110 families enumerated, 108 belong to angiosperms and two to gymnosperms. The predominant life forms of sacred groves were the trees which represented 42.25% of the total vegetation comprising 139 species from 127 genera under 107 families. The shrubs were the next largest group representing 28.88% of the vegetation comprising of 95 species from 62 genera under 41 families. Herbs were third largest, which included 79

species from 54 genera and 38 families that amounted to 24.01% of the total vegetation. The climbers, twiners and lianas altogether formed the rest (4.86%) and represented the characteristic component of tropical forests. Out of the 189 species, 12 species (Shrubs, herbs and climbers) are rare, endemic and threatened, belong to 12 genera and 11 families. Of these, 6 are shrubs, 4 are herbs and 2 are climbers and twiners. Most of them are medicinally useful. A brief note, on their habit, status, medicinal/economic uses are given in Table-1.

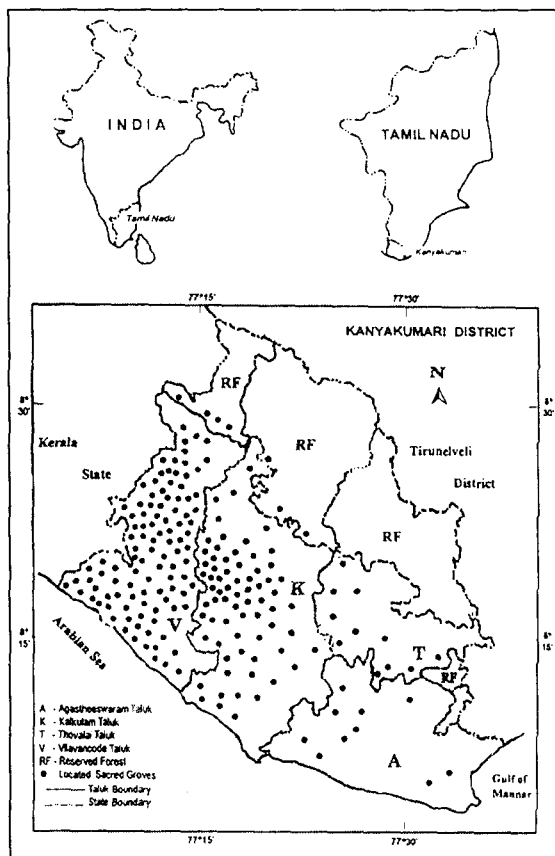


Fig. 1: Distribution of Sacred Groves in Kanyakumari District (with Study area).

Topographically, Kanyakumari District is divisible into three zones i.e. high, mid and low lands. The high lands in the District are the abode of most characteristic forest vegetation. Isolated pockets of vegetation in the Sacred groves of the mid land and relic of vegetation found along the

**Table-1:** Enumeration of rare, endemic and threatened shrubs, herbs and climbers in Sacred Groves studied

Plant Species, family, habit and important characters	Status	Medicinal / Economic uses	NGIF	SCCH
<i>Alpinia galanga</i> Sw. (Zingiberaceae). Aromatic perennial herb, to 1.5m high, flowers orange to red. Fl. & Fr. Aug. Sept.	Threatened, endangered in Western Ghats (Amalraj <i>et al.</i> , 1991)	Chew the rhizome for relieving the breathing problems and also to improve vocal abstractions; paste of rhizome orally for stomach pain and the same along with lime juice used for fungal infection and other skin diseases.	4	237
<i>Gloriosa superba</i> L. (Liliaceae). Glabrous branched climbing herb, to 3m long, tubers cylindric, flowers red. Fl. & Fr. Oct. – April	Endangered in Western Ghats (Amalraj <i>et al.</i> , 1991; Amiarthalingam, 1998)	Paste of tuber is used for treating menstrual irregularities, snake bite and skin diseases; tuber dried and powdered, taken with cow's milk is used as contraceptive for women.	19	643
<i>Hemidesmus indicus</i> (L.) R. Br. (Periplocaceae). Glabrous twining with milky latex shrub, to 2m long, flowers yellow. Fl. & Fr. July – March.	Depleted in Western Ghats (Matthew <i>et al.</i> , 1983; Vartak, 1983; Amalraj <i>et al.</i> , 1991)	Hot infusion of root bark with milk and sugar as tonic to children for chronic cough and diarrhoea; decoction of the roots for ulcers in all parts of alimentary canal.	37	204
<i>Indigofera uniflora</i> (Buch – Ham. ex Roxb. (Fabaceae). Slender perennial herb, to 40 cm tall, flowers small, reddish. Fl. & Fr. Nov. – April	Endemic to Western Ghats (Induchoodan, 1996)	Leaf made into paste to cure skin diseases.	9	287
<i>Justicia beddomi</i> (Cl.) Benn. (Acanthaceae). Glabrous branching shrub, to 0.75 m tall, flowers white. Fl. & Fr. Nov. – March)	Rare, threatened in Western Ghats (Henry <i>et al.</i> , 1978; Nayar, 1996; Subbarayalu and Velmurugan, 1999)	Decoction of leaves used for asthma	1	532
<i>Kaempferia galanga</i> Hk. (Zingiberaceae). Aromatic herb, spreading flat on the ground, root fibers cylindric, flowers white. Fl. & Fr. Oct. – Feb.	Endangered in Western Ghats (Amalraj <i>et al.</i> , 1991)	Powdered rhizome with honey for cough and pectorial affections, rhizome boil with oil externally applied to stop nasal bleeding.	12	76
<i>Leea indica</i> (Burm.f.) Merr. (Leeaceae). Branchlets warted shrub, to 5m tall, flowers pale yellow. Fl. & Fr. Dec. – Aug.	Rare and Endangered in Southern Western Ghats (Matthew and Mathew, 1991)	Roots are used as cure to diarrhoea	3	147
<i>Naregamia alata</i> Wt. & Arn. (Meliaceae). Erect under shrub, to 45 cm tall, flowers white. Fl. & Fr. Sept. – Oct.	Endemic to Western Ghats (Induchoodan, 1996)	Extract of whole plant mixed with coconut oil for itch and contagious skin diseases; decoction of root is given orally for dysentery.	38	348
<i>Ochlandra scriptoria</i> (Dennst.) Fischer (Bambusaceae). Erect shrub, to 4.5 m tall, spikes terminating leafy branches, spikelets cylindric, axillary or terminal panicles. Fl. & Fr. Feb. – July.	Endemic to Kerala (Singh and Subramanian, 1991)	Leaves used for thatching the temporary huts	3	712
<i>Osbeckia aspera</i> (L.) Bl. var. <i>wightiana</i> (Melastomaceae). Under shrub, to 65 cm tall, flowers purple pink. Fl. & Fr. May – Aug.	Endemic to Western Ghats (Induchoodan, 1996)	Ornamental purpose	20	627
<i>Petiveria alliacea</i> L. (Phytolaceaceae). Much branched glabrous sub shrub, to 1.3 m tall, racemes terminal, flowers purple green. Fl. & Fr. Dec. – May.	Rare in Peninsular India (Tandyekkal <i>et al.</i> , 1997)	Root extract used for cold and fever	1	348
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz (Apocynaceae). Erect shrub, to 75 cm tall, flowers white. Fl. & Fr. Feb. – June.	Endangered in Southern Western Ghats. (Nayar and Sastry, 1989 – 1990; Nayar, 1996; Subbarayalu and Velmurugan, 1999)	Decoction of roots during labours for contraction of uterus, juice of leaves used for removal of opacities of the cornea of the eyes.	2	411

Abbreviations: NGIF = Number of Groves Identified From the study area; SCCHN = Scott Christian College Herbarium Number.

coastal belt of the low land speak of a glorious past. Today, in such formation, several rare, endemic, threatened and other characteristic species are flourishing. From the present study it is evident that, these are conserved in the groves along the mid and high land area of Vilavancode and Kalkulam taluks which are included in the Southern Western Ghats. The rainfall, humidity and soil fertility of these taluks are gradually degrading due to various developmental activities like encroachment, urbanization, and mining operations; which being steadily depleted these species. Apart from these, the effects of pests and diseases have also been sources of threat to several native plants. One of the endangered and threatened species *Rauvolfia serpentina* is recorded as endangered in the Red Data Book (Nayar and Sastry, 1987, 1988, 1990).

The present study also reveals that, the Sacred groves become the refuge for many endemic plant species requiring special habit preference. The fern *Tectaria zeylanica*, which is highly endemic to 'Silent Valley' (Sledge, 1982), is also preserved in the Sacred groves studied (Sukumaran *et al.*, 2006 and 2007). This gives a clue that even climax vegetation of various altitudes and latitudes can be conserved *in situ* in these groves. Endemic species of any geographical region throw light on the biogeography of the area, centers of speciation, areas of extinction and adaptive evolution of the flora (Ramesh and Paskal, 1997).

Henry *et al.* (1978) reported *Justicia beddomi* as, rare and threatened species in South India and Tandyekkal *et al.* (1997) reported *Petiveria alliacea* is rare in peninsular India. These two species are restricted in distribution i.e. recorded from only one grove each. According to informants, the studies rare, endemic and threatened herbs and shrubs are capable of healing various diseases such as asthma, breathing problems, diarrhoea, dysentery, fever, chronic, cough, cold, menstrual irregularities, nasal bleeding, snake bite, skin diseases, stomach pain, uterus diseases etc. The ethnobotanical value of sacred groves also an important factor for leading to their protection by local communities (Sukumaran *et al.*, 2005). Hence the folk and ethnobotanical knowledge is the best source of information of

preliminary screening in such instances. Methods of conservation and way to have sustainable utilization will be the need of the hour.

Most of these groves studied are situated in the border of Kerala and Tamil Nadu. The phyto-geographical analysis indicates (Sukumaran, 2002, 2007 and Sukumaran *et al.*, 2008) that all the twelve species are pantropical and paleotropical distribution. The endemic flora in Kerala is a paleotropic one, a part of the peninsular Indian endemic flora of the Gondwana land region (Nayar, 1997). Reason for the high percentage of endemism in Western Ghats have been reported to be due to a multiple of physical, climatological and geological changes that have occurred during the evolution of the flora as well as the peninsular Indian region (Sastry and Sharma, 1991). Habitats of endemic species are far more vulnerable than other species. Endemic species one lost in lost forever and hence these species need to be conserved on a priority basis.

Major reason behind the RET status is over exploitation/ extraction in the case of *Alpinia galanga*, *Gloriosa superba*, *Hemidesmus indicus*, *Kaempferia galanga*, *Rauvolfia serpentina*, *Naregamia alata* and destructive harvesting in the case of *Ochlandra scriptoria* and *Petiveria alliacea*. Nowadays expansion of agriculture, urbanisation, grazing by cattle, change in values and population pressure are the main causes for the depletion and degradation of the sacred groves. In order to conserve them and form a biological continuum, the sacred groves must be declared as heritage symbols and protected as plant genetic reserves for posterity.

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