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# Survey on the RET-listed Medicinal Plants in Thadagamalai Range of Kanyakumari District, Tamilnadu

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**Abstract**

Medicinal plant survey was conducted and assessed the endemic, endangered and threatened medicinal plants in Thadagamalai range of Kanyakumari Wildlife Sanctuary during the year 2011-2013. There are 25 RET-listed species enumerated and further analysed their distribution with various threat categories both global and regional scale. *Cycas circinalis* is only one species were identified critically endangered and other species are endangered (8 species), vulnerable (11 species) near threatened (4 species) and least concern (one species). The data provide the information for diversity of RET-listed medicinal species to design the sustainable utilization and conservation measures.

**Keywords:** Medicinal plants; RET-listed species; Threat status; Conservation

## Introduction

Among the plant diversity of India, medicinal plants are an important source which have been used all over the world. It has been widely used by all sections of the population, and country is richly endowed with a wide variety of plants of medicinal value, which represents the great national resource [1]. It is approximately estimated that at least 70 per cent of country's population relay on herbal medicines for primary health care. In India, different classical medicinal systems such as Ayurveda, Siddha and Unani are being practiced since time immemorial in the country and in addition to these; innumerable local folk medicinal traditions exist. In total about 8000 plant species are in medicinal use. It constitutes around 45 per cent of 17,500 known flowering plant species of India [2]. This rich medicinal wealth is mainly distributed in two hot spots diversity that is north eastern region and Western Ghats. The Western Ghats comprises of a hill range running about 1500 km long the western edge of Indian sub-continent. Although it covers a mere 5 per cent of the country's total land area in the country, it is believed to be more than 27 per cent of country's plant species remarkably high level of endemism ranging from 25 to 60 per cent of recorded species [3]. Medicinal trees are important components of the biodiversity of the Western Ghats. The high anthropogenic pressures and associated fragmentation of natural forests have resulted in loss of habitat and species. Medicinal plants are also under constant threat due to over exploitation from natural habitats in the absence of cultivation. Biogeographically, the Western Ghats have long been isolated from the vast south-east Asian humid forest tract and thus protect a relict pocket of evolutionarily distinct biota. Geology, soil and climate also contribute to promote high biodiversity in these regions.

Peninsular India has a centre of flowering plant endemism, due to diversity of climate and vegetation [4,5]. The Western Ghats of India is one of the 34 global biodiversity hotspots of the world [1] and over one-third of its angiosperms are endemic [6]. It is a chain of mountains of 1600 Km in length running parallel to west cost of Peninsular India from the river Tapthi to Kanyakumari, the southern tip of peninsular India. Many of these endemics are threatened due to human impacts and figure in the Red List of the International Union for the Conservation of Nature [7]. Kanyakumari is one of the smallest districts in Tamilnadu and has very high proportion of its landscape under tree cover (70%). The reserve forests and protected areas are owned and managed by the forest department and they constitute about 31 per cent of geographical area. The privately owned rubber and coconut plantations constitute 25 per cent of land areas and the tree density and diversity is depends on the land owners system. The study area of Thadagamalai Reserve Forest in Kanyakumari district is an attractive spot for taxonomist over two centuries, as possessed a part of rich plant diversity in southern Western Ghats.

## Materials and Methods

The study area in the Thadagamalai range of Kanyakumari Wildlife Sanctuary situated 250-1750 m above mean sea level, lying between 9°41.543' N-77°23.880' E to 8°18.465'N-77°29.440' E with different forest vegetation types. It covers an area of 675 hectares with rich diversity of potential endemic medicinal plants. Frequent field visits conducted to the area for surveying medicinal plants and collecting the data if local medicinal uses of plants from the study area. The plant specimens were collected in non-destructive manner. The specimens were made into herbarium for identification with standard traditional method. The primary identification of plant specimens done with help of local and regional Floras [7,8-11] and the conformity of identification compared with authentic herbarium deposited Botanical Survey of India, Southern Circle, Coimbatore. The list of medicinal species prepared and analysed the endemic, endangered and

threatened plants with pertinent literature [12-15]. The available red listed medicinal plants enumerated from the study area for the preparation of conservation measured to ensure the survival of potential red listed medicinal plants for posterity.

## Results and Discussion

In Thadagamalai range of Kanyakumari WLS composed of scrub forest, dry deciduous to moist deciduous teak forest and semi-evergreen forests dispersed with grass lands at high altitude. There are 25 plant species identified as RET-listed medicinal plants which are distributed in different forest types with different categories of threat status (Table 1 and Figure 1). Out of 25 species, one species is critically endangered, 8 species are endangered, 11 species are vulnerable, 4 species are near threatened and only one species assessed least concern (Table 1). Of these medicinal plant species, *Arenga wightii*, *Eugenia calcadensis* (Figure 1d), *Hybanthus travancoricus* (Figure 1e), *Hydnocarpus macrocarpa* (Figure 1g) and *Phyllanthus singampattiana* are narrow endemic species of Kanyakuamri district, which are distributed restricted population in these forest areas. Many species are highly exploited for trade purpose either medicinal or some other purposes that are *Adenia hondala*, *Cycas circinalis* and *Gloriosa superba* only for medicinal purposes. *Artocarpus hirsutus*, *Canarium strictum* and *Santalum album* are largely extracted for both timber and medicinal value. Of these medicinal plants, 8 species are restricted to southern Western Ghats and few are distributed all over India for example *Celastrus paniculatus*, even though this species is facing great problem for its survival due to high value utilization in Indian medicine. Most of these endemic species are included in global Red List. Such species are *Adenia hondala*, *Aegle marmelos*, *Cayratia pedata*, *Cycas circinalis*, *Drosera indica* (Figure 1b), *Gardenia gummifera* (Figure 1f), *Gloriosa superba*, *Hydnocarpus pentandra*, *Persea macrantha*, *Salacia oblonga* (Figure 1h) and *Santalum album*.

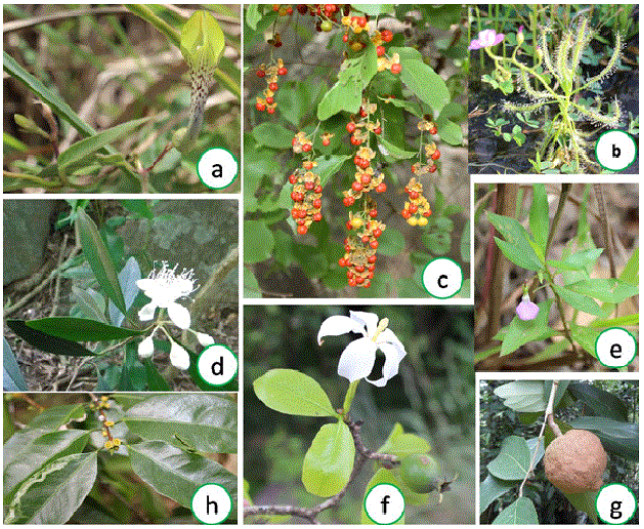


**Figure 1:** RET-listed medicinal plants collected from Thadagamalai Reserve Forest of Kanyakumari distirct. (a) Ceropegia hirsuta Wt. & Arn.; (b) Drosera indica L.; (c) Celastrus paniculatus Wild.; (d) Eugenia calcadensis Bedd.; (e) Hybanthus travancoricus Melch.; (f) Gardenia gummifera L.f.; (g) Hydnocarpus macrocapra (Bedd.) Warp.; (h) Salacia oblonga wall.

| Plant name distribution | Family | IUCN Threat status | Area of |
|---|---|---|---|
| *Adenia hondala* (Gaertn.) W.J. de Wilde. | Passifloraceae | EN | Peninsular India |
| *Aegle marmelos* Correa | Rutaceae | VU | Peninsular India |
| *Arenga wightii* Griff. | Arecaceae | VU | SWG |
| *Aristolochia tagala* Cham. | Aristolochiaceae | NT | Peninsular India |
| *Artocarpus hirsutus* Lam. | Moraceae | VU | Peninsular India |
| *Canarium strictum* Roxb. | Burseraceae | VU | Peninsular India |
| *Cayratia pedata* Gagnep. | Vitaceae | EN | Peninsular India |
| *Celastrus paniculatus* Wild. | Celastraceae | NT | India |
| *Ceropegia hirsuta* Wt. & Arn. | Apocynaceae | VU | Peninsular India |
| *Cycas circinalis* L. | Cycadaceae | CR | Peninsular India |
| *Drosera indica* L. | Droseraceae | EN | Peninsular India |
| *Eugenia calcadensis* Bedd. | Myrtaceae | EN | SWG |
| *Gardenia gummifera* L.f. | Rubiaceae | VU | Peninsular India |
| *Gloriosa superba* L. | Liliaceae | LC | India |
| *Glycosmis macrocarpa* Wt. | Rutaceae | VU | SWG |
| *Holostemma ada-kodian* Sch. | Apocynaceae | NT | Peninsular India |

| | | | |
|---|---|---|---|
| *Hybanthus travancoricus* Melch. | Violaceae | VU | SWG |
| *Hydnocarpus macrocarpa* (Bedd.) Warp. | Flacourtiaceae | EN | SWG |
| *Hydnocarpus pentandra* (Buch.-Ham.) Oken | Flacourtiaceae | EN | SWG |
| *Nothapodytes nimmoniana* (Graham.) Mabb. | Icacinaceae | VU | Western Ghats |
| *Persea macrantha* (Nees) Kosterm. | Lauraceae | EN | Peninsular India |
| *Phyllanthus singampattiana* (Sebastine and Henry) Kumari | Phyllanthaceae | VU | SWG |
| *Pseudarthria viscida* (L.) Wt. and Arn. | Fabaceae | NT | Peninsular India |
| *Salacia oblonga* Wall. | Salaciaceae | VU | SWG |
| *Santalum album* L. | Santalaceae | EN | Peninsular India |

**Table 1:** Enumeration of rare, endemic and threatened medicinal plants in Thadagamalai Reserve Forest of Kanyakumari district. (CR: Critically endangered; EN: Endangered; VU: Vulnerable; NT: Near threatened; LC: Least concerned; SWG: Southern Western Ghats)

This is the preliminary survey of the red-listed medicinal plant diversity in Thadagamalai range of Kanyakumari WLS. It provides some base line data for sustainable utilization and conservation measures for potential national bio-resources. Ecological amplitude is the ability of a growing medicinal plants species in habitat with environmental gradients. Several scientists have referred to this feature by various terms like niche width, habitat preferences or habitat versatility. Until now there are no exclusive studies on the population biology or ecological amplitude of RET medicinal plants. The habitat ecology of *Nardostachys jatamansi* a critically endangered herbaceous plant species of western Himalaya was assessed [16]. The ecological status of different tree species including some medicinal tree like *Artocarpus hirsutus* in Peppara Wildlife Sanctuary, Kerala was studied [17]. In Western Ghats, the studies need for the effect of distribution levels, forest types and association on the regeneration of important medicinal species. A few studies have reported for regeneration and distribution of medicinal trees like *Palaquium ellipticum* [18], *Myristica malabarica* [19] and *Embelia ribes* [20].

In many cases, the declining habitats of native plants can no longer supply the expanding market for medicinal plant products. In the case of rare, endangered or over-exploited plants, cultivation is the only way to provide material without further endangering the survival of those species. The best means of conservation is to ensure that the populations of species of plants continue to grow and evolve in the wild in their natural habitats. The study gives basic knowledge about documentation of niches and amplitude of rare, threatened and endemic species in a regional scale. This documentation can help locate areas and habitats of high concentration of these species so that critical habitat/habitat sites would get priority for conservation.

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