

Documentation on the Vulnerable and Rare plant species of Madurai forest division, Tamil Nadu, India

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Abstract

This paper describes the threatened plant species found in Madurai Forest Division of Tamil Nadu, India. There are five forest types namely Southern Tropical Moist Mixed Deciduous Forest, Southern Tropical Dry Mixed Deciduous Forest, Southern Tropical Dry Deciduous Scrub Forest, Southern Tropical Riparian Fringing Forest and Southern Tropical Carnatic Umbrella Thorn Forest. *Chloroxylon swietenia* DC., *Crotalaria globosa* Wight & Arn. and *Psydrax dicoccos* Gaertn. were documented in these forest types. The three species of plants were reported as Vulnerable and Rare according to IUCN and Red Data book. Conservation steps have to be taken in order to maintain these species in the various forest types.

Keywords: vulnerable, rare, IUCN, red data, Madurai, Tamil Nadu, India

Introduction

The term biodiversity is an amalgam of two words biological and diversity. Floral and faunal diversities are two facts components of biodiversities which covers the variety and variability of species. Many thousands of wild plants have great economic and cultural importance, providing food, medicine, fuel, clothing and shelter for humans around the world. Plants also play a key role in maintaining the Earth's environmental balance and ecosystem stability. They also provide habitats for the world's animal and insect life. The Government of India has already mandate up with a Biodiversity Acts, 2002 and national Environment policy, 2005. To achieve the effective implementation of the above acts we must have a comprehensive update list of plants and animals of the region with particular interest to rare and threatened taxa. The disappearance of such vital and large amounts of biodiversity presents one of the greatest challenges for the world community to halt the destruction of plant diversity that is essential to meet the present and future needs of humankind.

Peninsular India has a centre of flowering plant endemism, due to diversity of climate and vegetation (Ahmedullah and Nayar 1987, Nayar 1996) [1, 9]. 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. The IUCN Committee for threatened plants has identified 23 factors as possible threats to natural population of plants viz. grazing, changes in arable farming, ploughing of old grasslands, forestry operations, traditional destructive practices, flooding, drainage, water pollution, air pollution, industrialization and urbanization, road laying, tourism development, dam construction, mining and quarrying, pressure from introduced plants, collections for horticulture, collections for botanical studies, critically

low population status, natural causes and lack of pollinators. (IUCN 2014) [2] The resultant effect of either one or several of these factors causes destruction of threatened plants in Madurai Forest Division. Thus, present attempt has been made for documentation of floral components and threatened or rare plants of Madurai Forest Division. These rare and threatened plants species has to be highlighted for their conservation.

Study Area

The study was carried out in Reserve forests of Madurai. The five forest types in Madurai Division are:

1. Southern Tropical Moist Mixed Deciduous Forest
2. Southern Tropical Dry Mixed Deciduous Forest
3. Southern Tropical Dry Deciduous Scrub Forest
4. Southern Tropical Riparian Fringing Forest
5. Southern Tropical Carnatic Umbrella Thorn Forest

Southern Tropical Moist Mixed Deciduous Forest

This forest is constituted by various medium sized trees. Dominant plants of this type are *Albizia amara*, *Commiphora berryi*, *Atalantia monophylla*, *Capparis sepiaria*, *Diospyros montana*, *Acacia planifrons*, *Caralluma adscendens*, *Aerva lanata*, *Hibiscus micranthus*, *Cocculus hirsutus* and *Cissus quadrangularis*.

Southern Tropical Dry Mixed Deciduous Forest

Dominant plants of this forest are *Sapindus emarginatus*, *Premna serratifolia*, *Cardiospermum canascens*, *Waltheria indica*, *Hugonia mystax*, *Commiphora caudata*, *Toddalia asiatica* and *Givotia rotleriformis*.

Southern Tropical Dry Deciduous Scrub Forest

This forest is characterized by many thorny species. Dominant plants of this forest are *Albizia amara*, *Carissa*

spinarum, *Strychnos nuxvomica*, *Maytenus emarginata*, *Pterolobium hexapetalum*, *Benkara malabarica*, *Catunaregam spinosa* and *Dodonaea viscosa*.

Southern Tropical Riparian Fringing Forest

The riparian vegetation along the streams and revolute in the hills constitutes an interesting ecosystem. A number of trees grow along the banks of these streams. Dominant plant species of riparian fringing forest are *Alangium salvifolium*, *Mimusops elengi*, *Pongamia pinnata*, *Syzygium cumini*, *Ficus hispida*, *Phyllanthus reticulatus*, *Allophylus cobbee* and *Pleiospermium alatum*.

Southern Tropical Carnatic Umbrella Thorn Forest

This forest is characterized by the presence of *Acacia planifrons* with its umbrella shaped crown. The most important species are *Euphorbia tortilis*, *Naringi crenulata*, *Acacia leucophloea*, *Hugonia mystax*, *Sansevieria roxburghiana*, *Ziziphus mauritiana* and *Ziziphus oenoplia*.

Methodology

In order to quantify the frequency and distribution, quadrats were laid across the different forest types. 30 cm gbh for trees, 10cm for shrubs. 33.4 X 33.4 m quadrat were laid and for shrubs sub-quadrats with 3x3 m and for herbs with 1x1 m.

The plants were identified with the help of Floras (Gamble (1915) [3], Henry *et al.* (1987) [4], Matthew (1983) [5] and endemic floras were identified with the help of (Henry *et al.*, (1979) [6], Nayar (1982) [7], Nayar and Sastry (1990) [8].

IUCN Red List

IUCN Species are classified by the IUCN Red List into nine groups, set through criteria such as rate of decline, population size, area of geographic distribution and degree of population and distribution fragmentation.

1. Extinct (EX) – No known individuals remaining.
2. Extinct in the wild (EW) – Known only to survive in captivity, or as a naturalized population outside its historic range.
3. Critically endangered (CR) – Extremely high risk of extinction in the wild.
4. Endangered (EN) – High risk of extinction in the wild.
5. Vulnerable (VU) – High risk of endangerment in the wild.
6. Near threatened (NT) – Likely to become endangered in the near future.
7. Least concern (LC) – Lowest risk. Does not qualify for a more at risk category. Widespread and abundant taxa are included in this category.
8. Data deficient (DD) – Not enough data to make an assessment of its risk of extinction.
9. Not evaluated (NE) – Has not yet been evaluated against the criteria

Results and Discussion

Threatened plants of Madurai Forest Division:

1. *Chloroxylon swietenia* DC.

Family: Rutaceae

IUCN Category: Vulnerable

Location: Perumaalmalai RF, Kiluvamalai RF, Sirumalai RF

Description: It is a medium sized and deciduous tree with a height of about 9 -15 m and 1.0 - 1.2 m girth with a spreading crown and clear bole up to 3 m. The leaves are 15 - 23 cm long and abruptly pinnate. The leaflets (10 - 20 pairs) are sub-opposite or alternate, oblong, obtuse, glabrous and glaucous. Flowers are white or cream in colour and present in terminal or axillary panicles.

Flowering phenology: March - April

Fruiting phenology: May – August

Propagation: Seeds

Present status:

Chloroxylon swietenia is a slow-growing species which has become very scarce in most areas because of timber exploitation. A vulnerable species is one which has been categorized by the International Union for Conservation of Nature as likely to become endangered unless the circumstances threatening its survival and reproduction improve. Vulnerability is mainly caused by habitat loss or destruction.

2. *Crotalaria globosa* Wight & Arn. *Chloroxylon swietenia* DC., *Crotalaria globosa* Wight & Arn. and *Psydrax dicoccus* Gaertn.

Family: Fabaceae

Red Data Category: Rare

Location: Perumaalmalai RF

Description:

Herbs prostrate; branchlets terete, much branched, silky-hairy. Leaves simple, alternate; petioles 1–2 mm long, exstipulate; Inflorescence a 1–3-flowered raceme, leaf-opposed; peduncle 1–4 cm long, pilose. Flowers ca. 1.5 cm across; Pods globose, 5–8 mm across, brown, sessile, turgid, short, stiff, whitehairy. Seeds 3–5, ovoid or subreniform, 2 mm across, yellowish-brown. obscurely striate.

Flowering phenology: November- December

Fruiting phenology: January - February

Propagation: Seeds

Present status: Heavy grazing is a very important cause for the decline in population of the herbaceous species.

3. *Psydrax dicoccus* Gaertn.

Family: Rubiaceae

IUCN Category: Vulnerable

Location: Kiluvamalai RF

Description:

It is a tree, 6 to 8 meters or more in height. Leaves are extremely variable, ovate, elliptic, ovate or somewhat rounded, 5 to 15 cm long, 1.5 to 10 cm wide, leathery, shining above, and usually pointed at both ends. Flowers are white, with very slender stalks, 5 to 10 mm long, and

borne in compressed, short-stalked cymes. Calyx is cut off at the end or obscurely toothed. Corolla is bell-shaped, with a 4- to 6-mm tube, and five somewhat pointed lobes. Fruit is rounded, ellipsoid or obovoid, 6 to 10 mm long, slightly flattened and obscurely 2-lobed.

Flowering phenology: January-February

Fruiting phenology: March-April

Propagation: Seeds

Present status: Timber is used to make combs; exploited for that by small scale industries.

Three species of plants have been reported as Vulnerable and Rare according to IUCN and Red Data book. Conservation steps have to be taken in order to maintain these species in various forest types. Mainly anthropogenic pressures like grazing and illegal exploitation of plants for timber and medicine are various reasons for the decline of these species.



Chloroxylon swietenia DC.



Psydrax dicoccos Gaertn.



Crotalaria globosa Wight & Arn.

Fig 1: Threatened plants of Madurai forest division

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