

# Flora of Sri Lanka

Our flora can be divided to three main groups; native/indigenous plants, endemic plants and introduced (exotic) plants.

## **Native/ Indigenous plant species:**

Every type of plant whether algae, fungi, bacteria or a higher plant has a home in some part of the world, where it is existed for thousand years as a result of evolution. A native (indigenous) species is one that occurs in a particular region for thousands of years without direct or indirect human actions. About 75% of the plants found in Sri Lanka (about 6800 plant species) are native to us.

## **Endemic species:**

A special category of native species that live only in certain restricted geographic areas. Area could be a small region, an island, a large continent or even larger. However endemism is considered in terms of county boundaries for easy administration purposes.

There is one endemic genera (*Stemonoporus*) in Sri Lanka while there are no plant families endemic to Sri Lanka. About 90% of our endemic plants are confined to the southwestern zone (mainly in the rain forests).

## **Introduced plants (aliens/ exotics):**

These are plants that are intentionally or unintentionally introduced to new areas by human activities. About 25 % of our flora consists of exotic plants.

In the past earth's oceans, mountains, and deserts acted as natural barriers for the isolation of plants and animals by restricting the movement across the world. But with early human migrations the world's first plant introductions were initiated.

The introduced plant to a new area is called an **alien/exotic** plant. But with time it becomes a part of natural landscape over large areas and become **naturalised**. Of our exotic plant species about 32% has been naturalized while 68% is under cultivation. Sometime an exotic or an introduced plant could be invasive if it triggers changes in natural or human induced habitats. These are called **invasive alien plants** (or we identify them as **weeds** if these are associated with man made habitats).

## **Some invasive species distributed through out Sri Lanka**

(Note:S- sinhala names , EEnglish names)

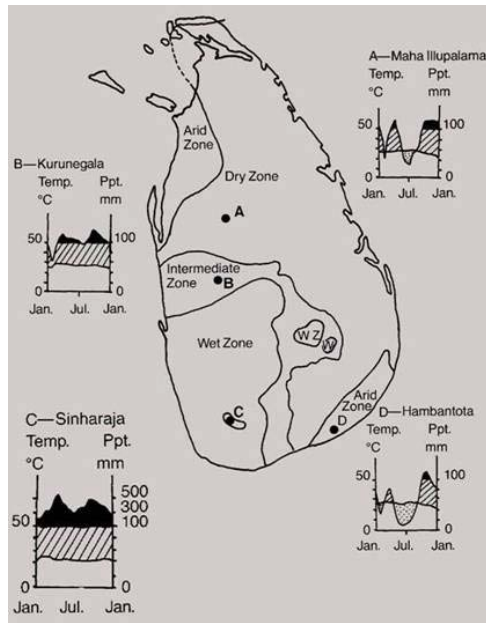
<i>Lantana camara</i>	E - <b>lantana,</b>	S - <i>Gandapana</i>
<i>Leucaena leucocephala</i>		S - <i>Ipil Ipil</i>
<i>Panicum maximum</i>	E - <b>Guinea grass species</b>	
<i>Eichhornia crassipes</i> –	E - <b>Water hyacinth</b>	S - <i>Japan Jabara</i>
<i>Salvinia molesta</i>	E - <b>Salvinia</b>	
<i>Annona glabra</i> (in marshlands),	E - <b>Pond apple</b>	S - <i>Wel atktha, Wel anoda</i>

**Why we have rich Floral and faunal diversities ?**

Sri Lanka is an island located in the tropical belt close to the equator between 5°.55- 9°.50 and 79°.42'- 81°- 52' . Despite of the little acreage, 65, 610km<sup>2</sup>, the topography varies from flat lowland to a mountainous region up to 2500m altitude with two clear peneplains at Kadugannawa and Ramboda respectively.

The rainfall pattern clearly categorizes the country into 4 regions, wet, intermediate, dry and arid regions. The changes in temperature also support to demarcate these zones.

The soils of Sri Lanka represent 14 great soil groups, Red Yellow Podzolic soil is common to wet zone while Reddish Brown earth dominates in the dry zone.



Climatic factors	Wet Zone	Dry Zone	Arid Zone
Mean Annual Rain fall (mm)	>2500	< 2000	< 1250
No. of Dry Months:	None	5-7	5-7
Mean Annual Temp. °C	20 -28	27-28	27-28

**Principle Vegetation types of Sri Lanka**

**Terrestrial:**

**Forests**

Lowland rain forest / lowland evergreen forest

**Sub Montane**

evergreen forest

Montane evergreen forest

Moist semi evergreen forest / intermediate forests

Dry mixed evergreen forest / moist deciduous forests

Thorn forest

Savanna Forest

Swamp forest

Mangroves

**Grasslands**

Wet Pathana  
Villu  
Thalawa

Dry Pathana  
Damana,

**Coastal:**

Mangroves  
Salt marshes  
Sand dunes  
Mud flats  
Sea grass beds

**Aquatic/fresh water:** plants in Streams/ rivers  
Ponds/ tanks  
Flood Plains  
Wetlands

# Vegetation in Marine and Coastal Areas

Coastal zone of Sri Lanka includes a 2 km band of shallow sea and a 300m strip inland. The coastal belt of Sri Lanka is about 1585km long.

**Two types of habitats are recognized in the coastal zone of Sri Lanka.**

1. Marine habitat - the belt of shallow sea.
2. Maritime habitat - boundary of land exposed to tidal differences.

## 1. Marine habitat

**Eumarine habitats:** include rocky habitats dominated by algae (sea weeds) and corals.

Algae types could be green, brown or red algae. Eumarine habitats could be seen at Hikkaduwa, Midigama, Negombo, Puttalam, Mannar, Jaffna, Mulative, Pasikuda, Trincomalee, Tangalle and Hambanthota areas. These habitats are very sensitive to pollution and thus many areas have been highly disturbed and/or deteriorated by various human actions.

**Lagoons and Estuarine habitats:** lagoons and estuaries are disturbed throughout due to high and low tide differences of the sea and also by many human activities such as fishing and pollution. Therefore, physical and chemical parameters of water in these areas, (acidity, salinity, minerals, dissolved oxygen etc) change frequently. Dominant plants in these habitats are the planktons (free floating microscopic species) which include unicellular (one celled) green algae and/or blue green algae. Few higher plants are also seen in these habitats. Rakewa, Kalamatiyawa and Lunama, Puttalam, Kalpitiya and Negambo are few places that Lagoon and Estuarine water communities are seen.

## 2. Maritime habitat

This includes Mangroves, salt marshes, sand dunes, parts of lagoons and estuaries, sea shore plants on the beaches and inland water bodies situated at the boundary of the shore. Most of these habitats (especially the mangroves and salt-marshes) are salty. The plants that live in such habitats are collectively known as halophytes.

**Mangroves:** The soil of mangrove habitats is very unstable, salty (saline), moist at all times and poor in oxygen. The plants that grow in these areas are often exposed to high sunlight. Thus few plant species are able to tolerate this situation and as a result mangrove species are fewer in number compared that of inland plants.

Mangrove plants could be categorized into two, true mangroves that occur towards the boundary and mangrove associates that occur relatively more towards inland.

True Mangroves- Kadol (*Rhizophora* spp), *Avecinnia officinalis*, *Bruguiera gymnorrhiza*, *Lumnitzera racemosa*, Kirala (*Sonneratia acida*).

Associates- Beli patta (*Hibiscus tilliaceous*), Kottamba- (*Terminalia catappa*), Karan koku (*Acrosticum aureum*). Mangroves have been highly disturbed by human activities and are restricted to few localities around the island.

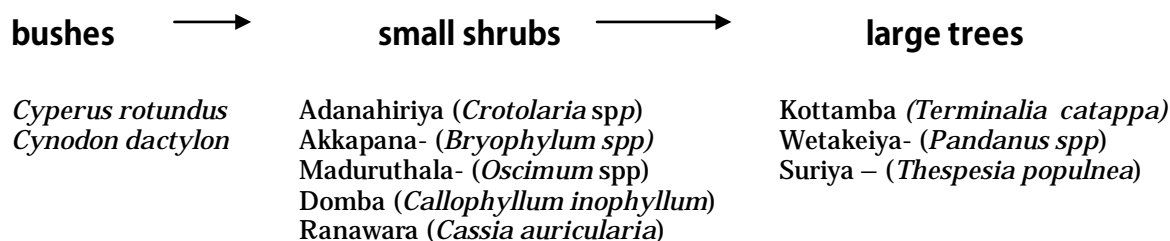
**Salt marshes:** This is a general term to indicate few plant species such as *Suada* and *Arthrocnemum* in the salt marsh pastures. These are small, 20-30 cm high shrub like plants that have a creeping stem bearing few short compactly arranged branches. They aggregate sand particles in between the branches and thus help to bind soil. In these communities other plants such as Genda (*Portulaca* spp), Wishnukranthi (*Evolvulus*) and some grasses are also seen.

These habitats could be seen in Yala, Ambalangoda, Hambanthota, Mannar, Puttalam etc. as scanty patches due to establishment of salt pans in these habitats.

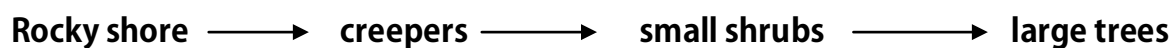
### Sea shore communities

These are also called **strand plants**. They live in loose sandy soil. Plants such as Hatawariya (*Asparagus racemosus*), Wara (*Calotropis gigantia*) daluk (*Euphorbia antiquorum*) are common in these places. These may associate with sand dunes as seen in Hambanthota, Puttlam, Mannar and Yala.

In an undisturbed sea shore a zonation of plants is seen. This is reflected by the habit of the plants. The slope and the width of the beach play an important role in the zonation of plants.



But if the sea shore is steep the zonation will be as follows



<b>Algae</b>	Binthamburu- ( <i>Ipomoea pescaprae</i> ) Maha Rawana Rewula- ( <i>Spinifex littorus</i> ) Hiramanadetta ( <i>Lippia nodiflora</i> ) Kalanduru ( <i>Cyperus rotundus</i> )
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The eroded sea shores which are the ones that have been expanded for tourism shows no zonation as above. Remnants of some creepers and shrubs are the only plants seen in such habitats.

Most of the sea shore plants are considered as xerophytes because they grow under conditions of extreme heat, sunlight, scarcity of water (water is there, but salty), dryness of the atmosphere and soil.

### Sand dunes:

Common in the North-East beaches of Sri Lanka. A sand dune initiates with an aggregation of sand in between shrubs and gradually become large enough to be identified as a sand dune.

These exhibit a unique landscape due to the zonation of vegetation in either side of the dune. The seaward side (towards sea) posses creepers while shrubs and trees occur in the much stable, leeward side (towards inland). Sometimes (less disturbed sites) show rich diversity of trees including Divul- (*Feronia acidissima*), Kohomba (*Azadirachta indica*), palu- (*Manilkara hexandra*) with bushes underneath such as Wara, Maduruthala, Ranawara, Andenahiriya etc and also an undergrowth comprising Girapala (*Commelina* spp), Getathumba (*Leucas zeylanica*), etc. This type of vegetation is commonly called a littoral woodland.

## Vegetation in Fresh water bodies/swamps

For convenience the fresh water habitats could be divided into

- Lake communities
- Running water communities
- marshlands

There are no natural lakes in Sri Lanka, instead many reservoirs and tanks are located in the dry zone, highest numbers reporting in Anuradhapura and Kurunegala districts. Some of these water resources are perennial while others are seasonal, however many are interconnected since they have been developed according to a cascade system. Among 10,000 reservoirs and tanks identified 3500 are significant.

Plants in these water resources can be grouped into marginal plants, deep water plants with floating leaves, submerged plants and planktons.

### Trees on bunds of fresh water habitats:-

Kaduru (*Pagianta dichotoma*)

Wal beli (*Hibiscus tilliaceous*)

Wetakeya

Attikka (*Ficus racemosa*)

Kumbuk (*Terminalia arjuna*)

### Marginal plants:-

Berudiyaniilla / Wel karabu (*Ludwigia spp*)

Kandulesa (*Drosera indica*)

Nilmonerassa (*Utricularia flexuosa*)

Diya Habarala (*Monochoria vaginalis*)

Kohila (*Lassia spinosa*)

Habarala (*Alocasia spp*)

Kokmota (*Eriocaulon spp*)

Thunhiriya

(*Cyperus*) Kudamatta (*Fimbristylis spp*) Kethela (*Lagenandra spp*)

### Deep water plants with submerged leaves:-

Kekatiya (*Aponogeton spp*)

Manel (*Nymphaea spp*),

Nelum (*Nelumbo nucifera*)

Free floating plants: *Pistia, Salvinia,*

Water hyacinth (*Eichhornia crassipes*)

*Hydrilla spp*

### Planktons:-

green algae

Blue green algae

The plants that live in water (most of the submerged plants and free floating plants are known as hydrophytes).

There are 103 rivers (9 major and 94 minor) radiating from the central highlands. The planktons are not dominant in running water since the water flows continuously. The speed of water flow plays an important role in determining the vegetation in these communities. In shallow areas with a low speed of flow, rooted plants with submerged leaves are common. In shady places ferns establish on the bunds. In areas with a high speed of water flow, very few plant species could be seen. These plants are not very common, but occur along the Mahaweli River in Kandy and suburbs.

## **Marshlands**

Occur in low lying areas and are important as flood plains. Since the marshy soil is always moist and poor in oxygen, the places possess a characteristic bad smell. Plants that prefer marshy soils are

### **Duck weed :-**

*Typha angustifolia*, *Habarala*, *Gahala*, *Kankun (Ipomoea aquatica)*, *Wel karabu (Ludwigia spp)*, *Kimbulwenna (Polygonum barbartum)* *Wel athatha (Annona glabra)*

Some grasses such as *Brachiaria mutica* and sedges such as *Kudametta*, *Thunhiriya*, *Kokmota*, *Cyperus spp*, *Kyllinga spp*

Waturana Swamp forest is a unique habitat with marshy soil harboring vegetation similar to a wet lowland forest. Species such as *Stemonoporus moonii* and *Mesua stylosa* which are endemic to Sri Lanka can be seen here.

## Wet Zone Forests

Due to the altitudinal variation forests of the wet zone (rain forests) can be divided into three sub categories.

### 1. Lowland rain forests – which exists <500m altitude.

This includes the Kanneliya- Dediya- Nakiyadeniya group of forests, Sinharajah and surroundings, Forests in Hiniduma and Kottawa, Gilimale, Yagirala, Waga, Kalatuwawa- Labugama etc in which tallest giant trees can be seen as emergents. These forests have the highest number of plant and animal species. The trees represent about 100-140 species belonging to 30- 40 plant families. The canopy height is about 25-45m. The endemism is about 60-70%.

The dominant plants are *Hora (Dipterocarpus spp)*, *Dun (Shorea spp)*, *Na (Mesua spp)*, *Malaboda (Myristica dactyloides)*, *venivel (Coscinium fenestratum)* etc.

Characteristic features of the lowland rain forests are

- Dark green leaves making interior gloomy and dark
- Tall straight trees branching at a higher level giving rise to a thick canopy
- Flowering on woody stems (cauliflory) and branches (ramiflory)
- Buttressed roots to support the heavy canopy
- Reddish young leaves to protect from high light intensity
- Bole and woody and climbers reach the top of canopy  
eg kala- wel, Pus- wel, Cane (weval)
- Mass flowering
- Epiphytes including many orchids, ferns etc

### 2. Submontane rain forests

These are the forests that occur in between the lowland and montane (mountainous) zone, i.e. between 500m- 1500m altitude essentially transitional being intermediate between rain forests and montane forests. Knuckles range, Peak wilderness, Hatton, Kotagala, Upper slopes of Sinharaja and Deniyaya, Sooriyakanda forests are examples. These also are rich in species composition. The endemism is about 50%.

The dominant trees are *Dun*, *Keena (Callophyllum spp)*, *Syzygium spp*, *Malaboda*

### 3. Montane rain forests

These are found in the hill country >1500m, eg. Horton Plains, Pidurutalagala, the upper areas of Knuckles range and Peak wilderness, Hakgala, Pattipola, Ambewela etc. The endemism of the forests is about 40%. Canopy height is about 5-6m. At summits these forests appear as pigmy forests.

The dominant tree species are *Domba (Callophyllum) spp*, *Sapu (Michelia nilagirica)*, *Syzygium spp*, *Davul Kurundu (Cinnamomum ovalifolium)*, *Symplocos spp*.

The canopies appear in shades of green, red and brown during April- July. Trees possess twisted branches that arise at a lower level covered with mosses, an umbrella shaped compact canopy with thick leaves. Understory of these forests are dominated by many shrub species making difficult to get in. Some species of shrubs are Nelu (*Strobilanthes spp*), *Hedyotis* and Bata (*Oclandra species*).

## **Forests of intermediate zone**

These have been heavily subjected to human disturbances and therefore today exist as patches in Samanalawawa, Randenigala and Wasgamuwa areas.

These have a mixture of some lowland wet zone species and some dry zone plant species. The endemism is about 17%. Species such as *Kekuna* (*Canarium zeylanicum*), *Pihimbiya* (*Filicium decipiens*), *Mora* (*Euphorbia longana*), *Etamba* (*Mangifera zeylanica*), *Wal del* (*Artocarpus nobilis*), *Milla* (*Vitex pinnata*) can be seen as dominants in these forests.

## **Forests of dry zone**

Forests of dry zone are considered to be secondary in origin. Eg. Hurula forest reserve, Udawalawe and Maduruoya National Parks, Giritale, Kaudulla, Minneriya etc. The endemism is about 13%. The forests are rich in timber and medicinal species such as *Palu* (*Manilkara hexandra*), *Burutha* (*Chloroxylon sweitenia*), *Weera* (*Drypetes sepiaria*), *Kohomba* (*Azadiracta indica*), *Ebony* (*Diospyros* spp) The canopy is light green, about 10-20m in height, scanty, letting the sun to fall into the forest floor.

In addition thorn scrubs such as *Salverdora persica*, *Eraminia* (*Zizipus* spp) occur in the arid zone of northwest and south east parts of Sri Lanka, eg. Yala and Wilpattu national parks.

## **Montane grasslands**

Grasslands that occur above 500m are called montane grasslands. These are also referred to as pathana grasslands.

### **Wet pathana grasslands:**

The soils of wet pathana are moist and possess a thick black layer of peaty soil at the top resembling a bog soil. The ground of wet pathana is not even, in many occasions it is undulating with 'hummocks' and 'depressions'. The dominant plants are short grasses growing up to 30-40cm, such as *Arundinella villosa*, *Gawara thana* (*Chrysopogon zeylanicus*). In addition several herbs occur here and there between the grasses. They are *Mahasudana* (*Anapalis* spp), *Exacum*, *Gaultheria rudis*, *Drosera* etc. The endemic *Ma Rathmal* (*Rhododendron zeylanica*) tree is often associated with wet pathana grasslands as seen in the Horton Plains.

### **Dry Pathana grasslands:**

The soils of these are frequently subjected to periodic burning practices. Often occur in rocky mountains in the intermediate zone and therefore subjected to erosion. eg. Deniyaya, Rakwana, Hanthana, Welimada, Uva region. The common plants that are seen in these areas are tussock forming grasses such as *Pengiri Mana*- (*Cymbopogon nardus* var. *citratu*) and *Illuk*- (*Imperata cylindrica*) which could grow up to about 1.5 m. In addition *Undupiyali* (*Desmodium triflorum*), *Embul embiliya* (*Oxalis corniculata*), *Monera kudumbiya* (*Vernonia cinerea*) are seen as the undergrowth. Shrubs such as *Adenahiriya*, *Hulanthala* (*Eleutheranthera* spp), *Gandapana*, *Bovitiya* (*Osbeckia* spp) could occur in disturbed sites. Sometime trees such as *Kahata* (*Carex arborea*), *Nelli* (*Phyllanthus emblica*) can occur occasionally in dry pathana grasslands.



### **Savanna grasslands:**

Savannas are characteristic because of their unique combination of grasses and large trees. The forests that have been removed for shifting cultivation and burning practices in the past appear today as savanna grasslands. The grasses often represent the ones that are found in dry pathana areas, but in addition species like Ginithana (*Panicum maximum*) and Eethana (*Heteropogon triticeus*) also occur. Many of the trees could be of medicinal value such as Nelli, Aralu (*Terminalia belerica*) Bulu (*Terminalia chebula*), Mee (*Madhuca longifolia*), Gammalu (*Pterocarpus marsupium*), Kahata (*Carea arborea*) etc. These can be seen in Mahiyanganaya, Bibile, Ella- Wellawaya etc.

**Thalawa grasslands:** similar to savanna, but mostly on flat land as in Gal-Oya area

**Dry Zone pastures :** could be further divided into Damana, Villu grasslands which are feeding grounds to cattle, elephant etc.

Damana differs from Savanna by having fewer trees such as Ehala (*Cassia fistula*), Divul (*Feronia assidissima*), Maila (*Bahunia racemosa*). Villu grasslands are much more wetter than the others.

**Arid Zone pastures:** very dry compared to the others. Mainly dominated by sedges, grasses etc. In addition Komarika, Hathawariya, Pathok are also common. The trees are less common but Andara (*Acacia* spp), is frequently seen in arid zone pastures.

**Scrubs and Thorn Forests:** Occur in North western and South eastern parts especially in Wilpattu, Yala and Batticaloa. These places experience a dry period about 4-7 months from March to September. Karamba (*Carissa* spp), Maliththa (*Salverdora persica*), Andara spp are common plants in these habitats.

## **Current status of Sri Lankan Flora**

During the last 100 years, about 100 plants have already been disappeared from the environment for ever.

Nearly 16% of flowering plants, 28% ferns and allies are affected as a result of human activities. These plants are therefore grouped under 'threatened plants'.

i.e. 480 flowering plants of which 228 endemic  
90 ferns of which 30 endemic  
99 Orchids out of 170 native species ( 20 threatened)  
Many medicinal plants- Malitha, Goda Kaduru, Ekaweriya  
Many timber species ( Ebony, Satin wood, Calamander, commercial rattan etc )

The reasons have been overexploitation, habitat degradation and fragmentation, pollution and introduction of alien invasive species.

### **National Tree** - (*Mesua ferrea*/*M. nargassarium*)

E - Iron wood

### **National flower** - (*Nymphaea nouchali*)

E - Blue water lily, S - Nil Mareel

## Wild flowers for provinces of Sri Lanka

Indigenous nature, current threat, locality, multiple uses including cultural, medicinal and religious aspects have been considered in selection of flowers. \* indicates that the flowers have been suggested, but not yet approved.

PROVINCE	FLOWER
Western	<i>Nelumbo nucifera</i> – (White lotus- E, Sudu nelum -S) aquatic plant rooted in mud with floating leaves
Southern	<i>Osbeckia octandra</i> ( Heen bowitiya- S), shrub of medicinal importance, flowering through out the year, Purple flowers
Sabaragamuwa	<i>Dendrobium maccarthiae</i> ( Wesak Orchid- E) an endemic threatened plant found in rain forests, flowering May- June. Flower colour pale purple with a dark purple center
Northern*	<i>Jasminium angustifolium</i> (Wal pihcha- S, wild Jasminium- E), Flowering during februar to April and in September, Flowers white, scented, borne in single. 7/8petals.
Northern*	<i>Evolvulus alsinoides</i> (Wishnukranthi-S) small creeping shrub with blue flowers through out of the year
Central	<i>Rhododendron arboretum</i> var. <i>zeylanicum</i> (Rhododendron-E, Maha Rathmal- S) Endemic, Flowering in February to July, Red flowers in clusters
Uva	<i>Rhynchostylis retusa</i> (Gurulu raja- S, Foxtail orchid- E) . Flowers pinkish white with a dark pink center, bloom in catkin like clusters about 2 ft long
Eastern*	<i>Crinum latifolium</i> (Goda manel/tholabo- S), type of a lily plant with pinkish white flowers having a red stripe in the middle. Scented. Flowering in August- February especially during rainy seasons
North Central	<i>Cassia fistula</i> (Ehala- S, showers of Gold-E), Flowering in February to August, yellow flowers in hanging clusters.
Wayamba	<i>Murraya paniculata</i> (Ettaria-S, orange jasmine-E), Scented nocturnal flowers white in colour, borne in clusters of 2/3

### Major Legislation that protects Flora of Sri Lanka

Fauna and Flora protection Ordinance,  
Plant protection Act,  
Botanic Gardens Ordinance  
Felling of trees Act

## Protected (Special) trees in Sri Lanka

**Orubendi Siyambalagaha** (*Tamarindus indica*) at Elahera Yoda Ela about 5 miles from Elahera anicut situated at Matale District of the Central province. It says that King Mahasena (334 A. D.) used this tree to tie his boat while travelling from Polonnaruwa to Elahera via Yoda ela. At present the tree is about 29 feet in girth and 65 feet tall.

### **Knox's tree** (*Tamarindus indica*)

Situated in Muttur in Trincomalee District at which Captain Robert Knox was arrested by the Kandyan Dissave in 1660's. The tree that we see now is a sapling of the original as it was blown down by a cyclone in 1958.

### **Na tree at Parakaduwa temple** (*Mesua ferrea*)

One of the oldest trees in Sri Lanka which is said to be 600 years old. It is 110 feet tall and 30 feet in girth. Situated in Parakaduwa about 6 miles away from Colombo- Ratnapura Road.

### **Na Tree planted by Mahathma Gandhi** (*Mesua ferrea*)

The tree was planted by Mahathma Gandhi in 1929. The exact location is not mentioned.

## Other trees of historic value

### **Mal Madara tree**

Situated in Ratnapura District, right bank of Walawe river about 8 miles of Uggal Kalthota (Sabaragamuwa Binthenne area). Believed to be 1000 years old.

### **Bamboo bush at Pethangoda**

Bamboo splinter from this tree killed King Rajasinghe of Seethawaka in 1952.

### **The Rasin Milla tree at Melsiripura**

Located at melsiripura off madanpola road. It is said that King Rajasinghe had stayed under this Milla tree when he wanted protection against a rebellion in 1664.

### **Katu Imbul (Gossampinus bombax) tree at Pallekenda**

The tree is located off Panadura- Ratnapura road near Epitawela School. A giant tree with a girth of 100 feet.

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\* some valuable books with maps, photographs and illustrations

- ♦ National Atlas of Sri Lanka- published by the Central Environmental Authority, Robert Gunawardhana mw, Battaramulla
- ♦ Natural Resources of Sri Lanka- National Science Foundation, Vidya mawatha Col 7
- ♦ Guide to National parks- Department of Wild life conservation, Gregory's Rd. Col 7
- ♦ Wild flowers of Sri Lanka- Royal Botanic Gds, Peradeniya