



Notes on the sheet Bangalore-Salem

J.-P. Pascal, B. R. Ramesh

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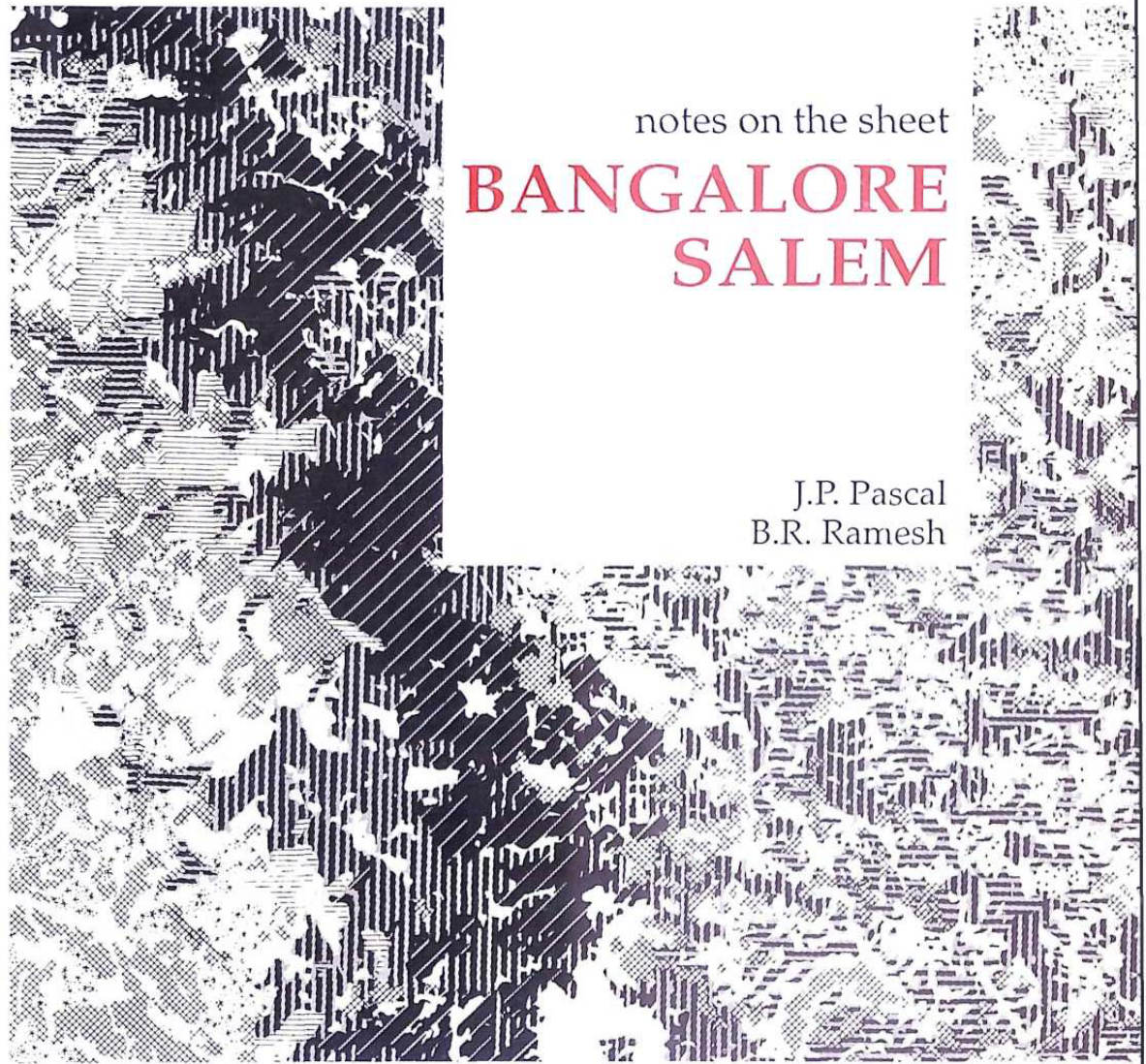
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FOREST MAP OF SOUTH INDIA

notes on the sheet

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J.P. Pascal
B.R. Ramesh



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INTRODUCTION

During the last fifty years, the forested area has changed considerably, mainly due to the rapid population growth. In overpopulated regions, the increase in population necessitates fresh clearing of wooded areas for agricultural and other purposes. New settlements can be observed, for example, in the foothills of the Ghats in northern Kerala and near the border of the Karnataka plateau in Sirsi, Siddapur and Yellapur regions.

The need to accomodate the rising population, as well as the construction of huge hydroelectric projects (some of which have already been completed, while others are still underway) in less populated areas, also lead to deforestation. Moreover, the continuous and ever increasing demand for wood by industries and for fuel wood by the population greatly accelerate tree felling operations. Overexploitation has thus brought about a rapid degradation of the forest, if not its total destruction in some areas.

A more rational management of the forest heritage is necessary, especially decisions concerning deforestation and afforestation policies, conversions, the choice of areas to be selected, and the degree of exploitation that may be permitted.

Thus, during the last few decades, several policies have been formulated with a view to protecting en-

dangered forests. Studies have also been carried out on the ecology and functioning of different forest types, the impact of major development projects, selection of species for afforestation programmes, etc., besides the creation of Wildlife Parks and Sanctuaries, Biosphere Reserves, and imposition of a ban on felling for a certain number of years in some of the endangered forests.

In order to meet these requirements, it became necessary to prepare a new vegetation map at an appropriate scale showing the actual state of the Forests, their environmental conditions (climate, edaphic, biotic, administrative) and their potentialities.

An agreement was signed between the French Institute of Pondicherry and the Forest Departments of Karnataka, Kerala and Tamil Nadu to map the main forested regions of these states, in six sheets, at the scale of 1: 250 000 (Fig. 1).

Three sheets with an explanatory booklet have already been published (Pascal *et al.* 1982 a, b; 1984; 1986). They cover an area of nearly 90 000 km², from 16° N up to 11°30' N. The Bangalore-Salem sheet presented here is the eastward extension of the Mercara-Mysore sheet, and concerns the south-eastern part of the Mysore plateau and the hills of the Eastern Ghats dominating the Tamil Nadu piedplain.

Chapter I

CONCEPTS AND METHODS

The methodologies and concepts used in preparing this sheet are similar to those used for the three earlier ones (Pascal *et al.* 1982a, b; 1984; 1986) and are based on the method developed by Gaussen for the International Map of the Vegetation and of Environmental Conditions, at the scale of 1:1 000 000. The originality of this method lies in complementing the map of the types of formations (for example, forests, savannas, thickets) with additional information, such as the climatic environment of these formations (precipitation and temperature) and the dynamic relationships between them. This kind of cartography thus provides information not only on the different types of vegetation and their extent, but also on their evolutionary potentialities in relation to the nature and intensity of anthropic pressure.

I - LOCATION AND IDENTIFICATION OF THE VEGETATION COVER

The method followed for the preparation of the map is illustrated in Fig. 2.

Field trips over almost 4 years to more than half of the 453 Reserved Forests found on the sheet enabled the constitution of a database which include the physiognomic and structural description as well as the floristic composition of the stand in each forest.

Field observations were complemented by existing literature (see References) and by data provided by the Forest Department: Working Plans, stock maps, 10% enumeration data, location of plantations, legal status of forests, etc.

The forests were demarcated by interpreting satellite imageries: Landsat (MSS, TM), SPOT and IRS.

II - TYPOLOGY OF THE DIFFERENT FORMATIONS

The plant formations were characterised by their physiognomy, phenology and floristic composition.

1. Physiognomy

The formations were classified according to their dominant biological strata (trees, shrubs, undershrubs

and herbs), density of the stand and the cover provided by the dominant stratum. Based on these criteria they were distinguished as:

- *Dense forest*: here, the term forest is strictly reserved for formations dominated by a tree stratum. A forest was considered as dense when the canopy cover was more than 80%.

- *Woodland to savanna-woodland*: the tree stratum of these formations is discontinuous, the percentage of cover varying between 80 and 50% for woodlands and between 50 and 20% for savanna-woodlands, where the ground is covered by a continuous carpet of tall grasses at least during the monsoon. Naturally, all the intermediate stages between these two formations are present.

- *Tree savanna to grass savanna*: these formations are characterised by a continuous grass cover with a few scattered trees (tree savanna), or shrubs (shrub savanna), or devoid of any woody species (grass savanna). Here also all the intermediate stages are encountered.

- *Scrub-woodland to dense thicket*: scrub-woodlands have a sparse and discontinuous tree layer. The grass cover is replaced by a dense and continuous scrub or shrubby layer often composed of thorny, spiny species. The tree stratum has disappeared in the dense thickets.

- *Discontinuous thicket to low scattered shrubs*: these formations are more open and lower in stature than those mentioned above. The shrubby layer becomes discontinuous. Palatable and unarmed species grow only in the middle of shrubs and are protected by thorny and spiny plants. Some scattered trees emerge here and there. In the low scattered shrub formation, the soil is more exposed to erosion as they only have a sparse grass cover with small interspersed shrubs.

Some of these physiognomic types are derived from each other through degradation because of man's destructive activity and grazing or, conversely, due to a gradual change following their protection. This dynamic link will be dealt later.

2. Phenology

Based on the percentages of evergreen and deciduous species, the formations are classified into three categories: evergreen, semi-evergreen and deciduous.

Evergreen forests: evergreen species constitute at least 95% of the stand. Deciduous species, found mainly in the openings, do not exceed 5% of the individuals.

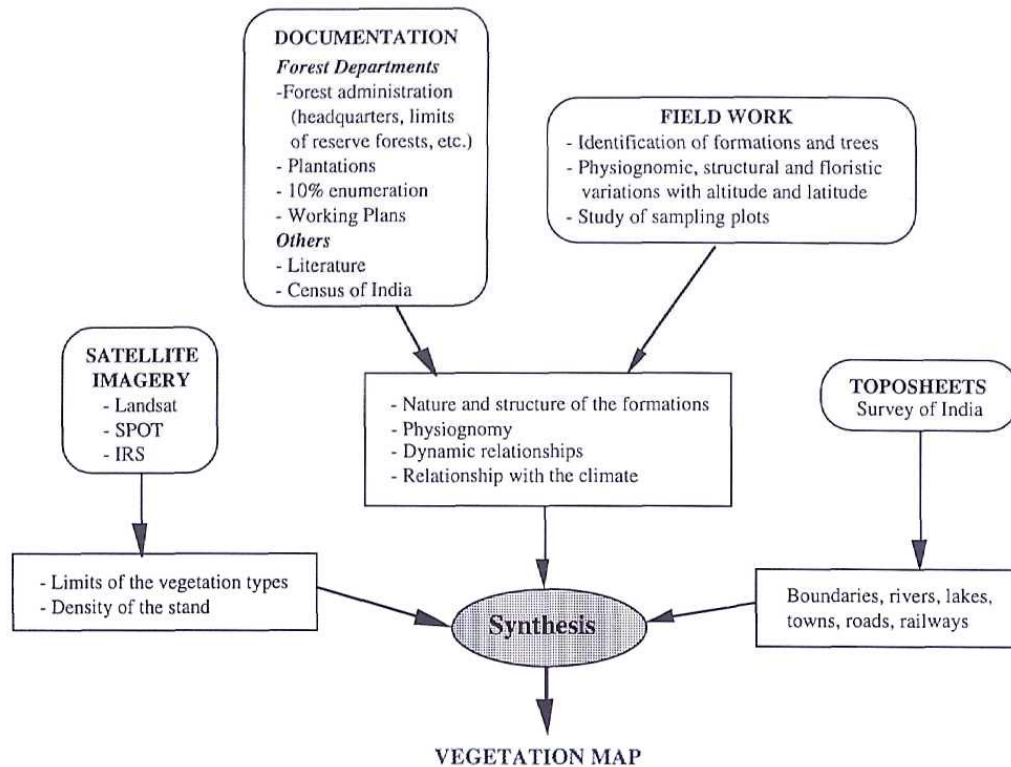


Fig. 2. Method followed for the preparation of the map

Deciduous forests: all the trees of the top canopy shed their leaves at the same time.

Semi-evergreen forests may be divided into two major groups: (i) The dominant stratum includes a mixture of evergreen and deciduous species, the latter comprising more than 5%. (ii) Evergreen species are absent or rare in the dominant stratum, but constitute practically the whole of the lower stratum, as is often the case in secondary forests in a humid environment. The recovering capabilities of these two types of semi-evergreen forests can be very different.

3. Floristic composition

Formations with similar physiognomy and phenology are further divided into *forest types* based on the main differences in their floristic composition.

The typology is based on the tree species which appear to be most characteristic of a milieu or certain climatic conditions. For example, those which are most sensitive to a reduction in temperature or rainfall, to the

rainfall regime, lengthening of the dry period, etc. They were also selected because of their relative abundance.

For example, in the *Mesua ferrea* - *Palaquium ellipticum* - *Olea glandulifera* type confined to the Bili-giri Rangan Hills and which is subjected to both the eastern and western climatic influences, *Mesua* and *Palaquium* were chosen not just for their abundance, but mostly because these two species find their eastern-most limit here. They occur in forest patches isolated from the forest continuum of the Western Ghats where they are common, specially at medium elevations. Thus, they represent the floristic link between this forest type and the evergreen forests of the Western Ghats. *Olea glandulifera* is not found in the wet evergreen forests of the Western Ghats and is characteristic of the drier regions exposed to the east. It represents the eastern influence which is also found in this forest.

Throughout the dry zone, one passes gradually from one type to another, with very little change in the species encountered. These types differ more in the relative

densities of the species. Thus, the composition of the *Anogeissus* - *Pterocarpus* - *Terminalia* type resembles that of the *Anogeissus* - *Chloroxylon* - *Albizia* type which, in turn, has many species in common with the

Albizia - *Acacia* type. The changes are generally gradual, particularly with increase in altitude. The local conditions, edaphic or of exposure, sometimes modify the limits of the altitudinal zonation (Fig. 3).

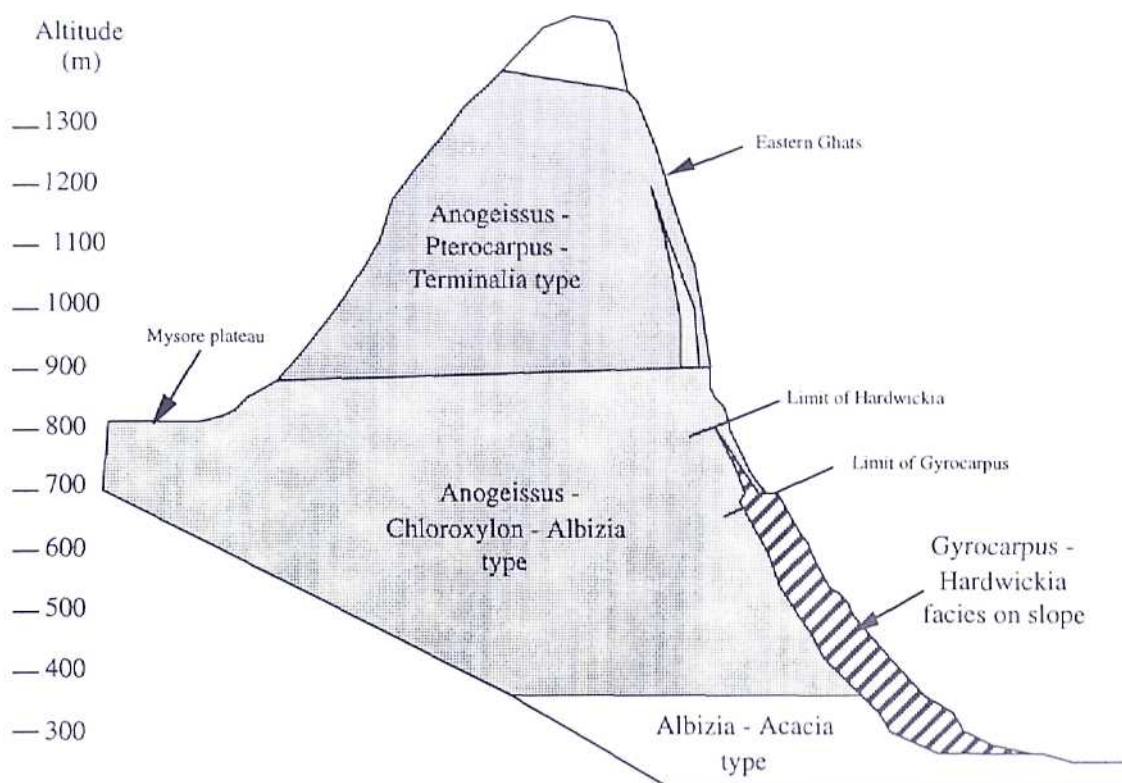


Fig. 3. Altitudinal zonation of the dry vegetation types

III - REPRESENTATION OF ECOLOGICAL CONDITIONS

1. Climate

The climatic conditions corresponding to each forest type in the mapped region necessitates a detailed study of the bioclimates. A synthesis of the whole of the Western Ghats was made at the scale of 1:500 000 (Pascal 1982c). Nevertheless, it was necessary to extend this work to the east of Biligiri Rangan Hills in order to cover the whole of the mapped region (see Chapter 2).

On the map, the climatic conditions are expressed by colours, following Gaussen's method (Bagnouls and Gaussen, 1953; Gaussen, 1959) which is also recommended by UNESCO (1973). The colours assigned to the rainfall range, varying from very dry to very humid, are in the following order: red, orange, yellow, light blue and dark blue. Colours corresponding to the three classes of mean temperature of the coldest month, ranging from cold to hot, are yellow, orange and

red. Thus, a forest growing under a rainy (blue) and warm (red) climate will be represented in blue + red = purple. Another forest situated in a rainy and cool environment would be shown in blue + yellow = green and a formation in a dry and hot environment would appear in red (dry) + red (hot) = red.

2. Biotic pressure and administrative information

Degradation of the forest is mainly related to the intensity of anthropic pressure.

Population density is shown on the map to provide an estimate of its requirements (in fuelwood, fodder, etc.). Towns and villages with a population exceeding 1000 persons are represented by circles whose diameter is proportional to the population (figures are from the 1991 census). As human activities are often along roadsides, accessibility of a forest is an indication of its potential for exploitation and risk of degradation. Hence, the network of roads, including important forest tracks, have been shown on the map.

Information on the legal status of the forests is also important. Among the forests managed by the Forest Department (Reserve forests, minor forests 'betta', revenue land, etc.), only the Reserve forests are outlined and identified by a number on the map. This number refers to a list given in the lower part of the sheet where the forests are classified according to their position in the territorial division of the Forest Administration (Range, Division, Circle, State). The administrative information is supplemented by the limits of Divisions and Circles and by the location of the headquarters of the Forest Department. A small scale inset also shows the boundaries of Circles and Divisions.

IV - IDENTIFICATION OF CLIMAX FORMATIONS

The first step was to identify the most advanced type of formation (forest, woodland, scrub-woodland, thickets, etc.) for each set of environmental conditions encountered in the mapped region. These formations should, according to Clements (1916, 1936), correspond to the *climax* under optimum conditions. However, this concept is debatable elsewhere as it supposes a state of equilibrium between the milieu and the vegetation.

1. Modifications introduced by human activities

The antiquity and intensity of man's action in the whole of this region has greatly modified the plant formations in such a way that the *climax* is rarely observed. Most often, a degraded formation is all that remains, sometimes far away from the potential *climax* of the place. The remnant species and formations, adapted to these very harsh microclimatic conditions, are mostly the same, whereas the bioclimate can be quite different. Degradation results in a kind of convergence in the vegetation, making it difficult to propose a theoretical reconstruction of what could have been the *climax*.

On the other hand, the areas of some formations which could locally correspond to a *climax*, have been extended due to man's action. They now dominate in places where they did not constitute the original *climax* formation and now form what appears a substitute *climax*. Such is the case of a considerable part of the tree savannas and scrub-woodlands, as well as the grass savannas on hills and mountains. Other formations, such as the evergreen forest patches or semi-deciduous forests confined to the talwegs, present a simplified structure and have lost some of their most sensitive species.

2. *Hardwickia binata* formations

The definition and delimitation of *Hardwickia binata* forest types posed a different kind of problem. Several

vegetation series with *Hardwickia* were recognized by Gaussen *et al.* on the maps at the scale of 1/100 000. The Cape Comorin sheet (Gaussen *et al.* 1961a, b) which goes up to 12°N does not identify any series characterised by *Hardwickia*, even though it covers the part of the Eastern Ghats and the plateau to the east of Biligiri Rangan Hills where *Hardwickia* is quite common. The *Hardwickia* - *Anogeissus* series is found from the extreme southern part of the Mysore sheet (Gaussen *et al.* 1965, 1966), mostly on skeletal soils. Another series makes its appearance on the Madras sheet (Gaussen *et al.* 1962, 1964), to the north of 13°N: the *Hardwickia* - *Pterocarpus santalinus* - *Anogeissus* series. Hence the greater part of this series is located to the north of the Bangalore - Salem sheet. At the most, only a few highly degraded thickets in the Bangarapet region can be considered to belong to it. Considering the very small area covered by this series on the sheet and the degraded condition of the stands (where *Hardwickia* is most often absent) that can be attributed to it, this series has not been represented on the sheet. Formations where *Hardwickia* is common are mostly situated on the eastern edge of the plateau and on the low elevation slopes of the Eastern Ghats. They were grouped under *Gyrocarpus jacquini* and/or *Hardwickia binata* types (on slopes, skeletal soils and as transitional facies). Indeed, very often *Hardwickia* is found growing in association with *Gyrocarpus*, especially on steep slopes. The presence of *Hardwickia* is indicated by the letter 'H'.

3. Teak forests

Teak is found in the deciduous formations on the slopes of the Biligiri Rangan Hills (BRH), on the reliefs around Madeshwara Malai and on the mountains dominating the pediplain of Tamil Nadu (Shevaroy, Chitteri, Elagiri) when precipitation exceeds 900 mm. However, teak is never as abundant as in the deciduous forests situated further west on the plateau which receives the major part of precipitation during the summer monsoon (see Mercara - Mysore sheet). It therefore seemed preferable to indicate this difference by retaining only some forests, situated on the western slopes of the BRH where teak is quite abundant, in the *Anogeissus* - *Tectona* - *Terminalia* type. The other forests where teak is clearly less common are included in the *Anogeissus* - *Pterocarpus* - *Terminalia* type. The presence of teak is indicated by the letter 'T' on the map.

4. Riparian forests

Some formations may be considered as specific to edaphic conditions which are particularly humid, for example, *Terminalia arjuna* - *Syzygium cumini* - *Pongamia pinnata* type which is confined to talwegs on the slopes of the Eastern Ghats at elevations generally

Table 1. Correspondence between the Forest Map of South India's classification and that of Champion and Seth (1968)

DRY VEGETATION TYPES	Forests	Forest Map of South India		Champion & Seth	
		Albizia - Acacia spp. type		6A/C1 - Southern thorn forest	
		Gyrocarpus and/or Hardwickia - scrub - woodland - savanna - woodland		6A/C1 - Southern thorn forest 5A/E4 - Hardwickia forest	
		Anogeissus - Chloroxylon - Albizia		5A/C3 - Southern dry mixed deciduous forest	
		Anogeissus - Pterocarpus - Terminalia spp.		5A/C3 -Southern dry mixed dec. forest 5/2S1 - Secondary dry deciduous forest	
		Anogeissus - Tectona - Terminalia		5A/C1b- Dry teak forest	
	Degraded stages	Savanna - woodland to tree savanna		5/DS2 - Dry savanna forest	
		Scrub - woodland to thicket		5/DS1 - Dry deciduous scrub 6A/C1 - Southern thorn thicket 6A/C2Dsl - Southern thorn scrub	
Discontinuous thicket to low scattered shrubs		6A/Ds3 - Southern Euphorbia scrub			
MOIST VEGETATION TYPES	Forests	Low elevation	Terminalia - Syzygium - Pongamia	4E/Rsl - Riparian fringing forest	
		Medium elevation	Elaeocarpus - Michelia - Canarium	Tropical wet evergreen forests	Sub-group 2A
			Mesua - Palaquium - Olea		1 A/C3 - Southern hilltop tropical evergreen forest
			High elevation	Diospyros - Memecylon - Olea	Sub - tropical broad - leaved hill forests
		Schefflera - Gordonia - Meliosma sp.			
		Schefflera - Neolitsea - Meliosma spp.			
		Degraded stages	Semi-evergreen forests		
	Tree savanna to grassland		8A/DS1 - South Indian subtropical hill savanna 11A/DS2 - Southern montane wet grassland		

lower than 1000 m. Another riparian type, the *Elaeocarpus tuberculatus* - *Michelia champaca* - *Canarium strictum* type is found on the western slopes at medium elevations in the BRH. Everywhere else, at medium and high elevations, the evergreen and semi-evergreen patches found in the talwegs do not represent the riparian type proper but seem to be the relics of forests that were once widespread but are now confined to the more humid pockets, anthropic pressure having taken a heavy toll of the evergreen forest. Although these forest patches are important elements for the conservation of biodiversity in this region, they could not be mapped because their size is too small for the scale of the map (1 mm = 250 m).

Table 1 groups all the forest types found on the sheet, as well as the different physiognomic stages derived through their gradual degradation, and gives their correspondence with Champion and Seth's (1968) classification which is generally followed in forest literature.

V - DYNAMIC RELATIONSHIPS

Although it is still possible to find some *climax* formations (*sensu* Clements) in this region, most often they are formations corresponding to more or less degraded stages of succession. An attempt can be made to

relate the different existing stages by observing the evolution of stands subjected to intense anthropic pressure or, conversely, those protected from the action of man and his animals. The formations can thus be classified into degradation or recovering series (Gausson 1966).

On the map, all the stages belonging to the same series are shown in the colour corresponding to the climatic conditions of the series. Physiognomically identical stages, resulting from the degradation of formations which were initially different and hence growing under different conditions, can thus be distinguished by their colour. The latter will indicate that the climatic conditions not being the same, the potentialities of recovery will not be the same either.

However, the possibilities of a return to the *climax* formation should be nuanced. Indeed, certain degradations in the plant cover are accompanied by a considerable degradation of the soil, especially by erosion. These new edaphic conditions may hinder recovery. Moreover, several species found in one physiognomic stage are no longer found in more degraded stages where moisture conditions are different. Their reappearance in the stand during a gradual recovery would depend on the proximity of seed-bearers. The reconstituted formation may thus be much poorer in species than the initial formation. There would thus be a reconstitution of the physiognomy and phenology, but not of the biodiversity.

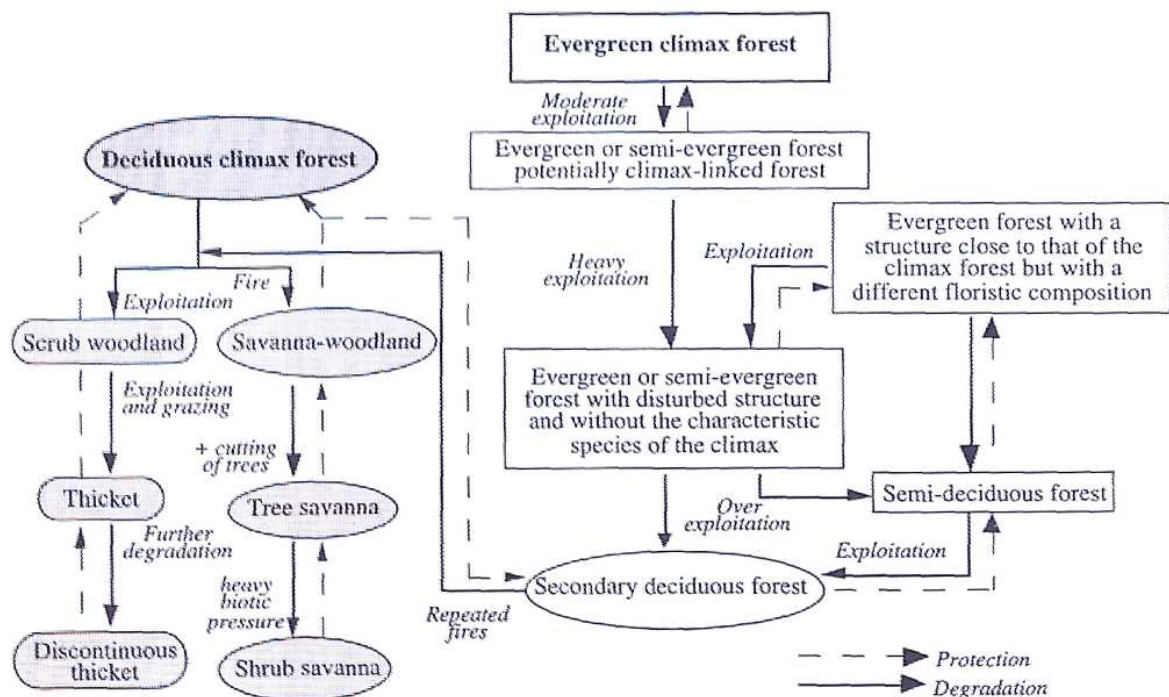


Fig. 4. Stages of succession derived from climax forests

These dynamic relationships are illustrated in Fig. 4.

In the legend of the sheet, the formations have been divided into two groups corresponding to two broad ecological categories: dry vegetation types and moist vegetation types.

1. Dry vegetation types

The most evolved physiognomic stage corresponding to the *climax* would depend on the amount of precipitation. Along the gradient of decreasing rainfall, it would be deciduous forest, savanna-woodland or scrub-woodland. Each of these *climax* stages could be more or less degraded by human interference.

Mostly situated in accessible areas, the dry formations have been subjected to intense and continuous anthropic pressure from a long time. Shifting cultivation, overexploitation, overgrazing and repeated fires are responsible for severe degradation. Two main degradation paths can be outlined:

(i) overexploitation, excessive cutting of wood or overgrazing convert a forest into scrub-woodland, to dense thicket, and then to increasingly lower and discontinuous thickets, and finally to barren soil.

(ii) exploitation and grazing accompanied by frequent fires which, by favouring the growth of grasses, gradually lead to a savanna-woodland, then tree savanna, shrub savanna and finally, to grass savanna.

2. Moist vegetation types

Some of the moist formations correspond to riparian forests. Those forests may be found in dry as well as moist regions. Because of their special ecological location, they are generally able to resist man's interference to a better extent, but under excessive pressure they get transformed first into a semi-deciduous forest, then to deciduous and lastly into increasingly open physiognomic stages (savanna-woodland, tree savanna, shrub savanna). The presence of some evergreen species is evidence of higher soil moisture.

Other *climax* evergreen formations have been separated according to altitude (medium and high elevations). They are found only on the reliefs and receive on the one hand, the highest rainfall, and on the other, an appreciable amount of moisture from occult precipitations (dew, mist) as a result of low temperatures. These evergreen formations are mostly confined to talwegs which further increase the humidity. Human activity first transforms them into semi-deciduous forests, then gradually into tree savanna, shrub savanna and finally into grassland. These grasslands of secondary origin should not be confused with those of edaphic or climatic origin which are often found towards the summits.

Chapter II

CLIMATE

In the studied area, the number of meteorological stations is high enough to enable a relatively accurate study of the bioclimatic conditions. However, most of these stations record only the rainfall, and very few, the temperature. Other parameters generally necessary for a more detailed study (evaporation, wind, etc.) are available only for big towns.

Therefore, the characterisation of the bioclimates is based only on climatic parameters which are commonly available, viz., rainfall and temperature, from which the length of the dry season is calculated.

I - RAINFALL

Two important aspects of rainfall are rainfall regime (i.e. season of occurrence of rains) and rainfall amount.

1. Rainfall regime

The rainfall regimes are illustrated in Fig. 5. The most striking feature in this region is the small amount of rain brought by the southwest monsoon, which falls on just a few reliefs in the southern part of the sheet (Biligiri Rangan Hills, Shevaroy). For the remaining

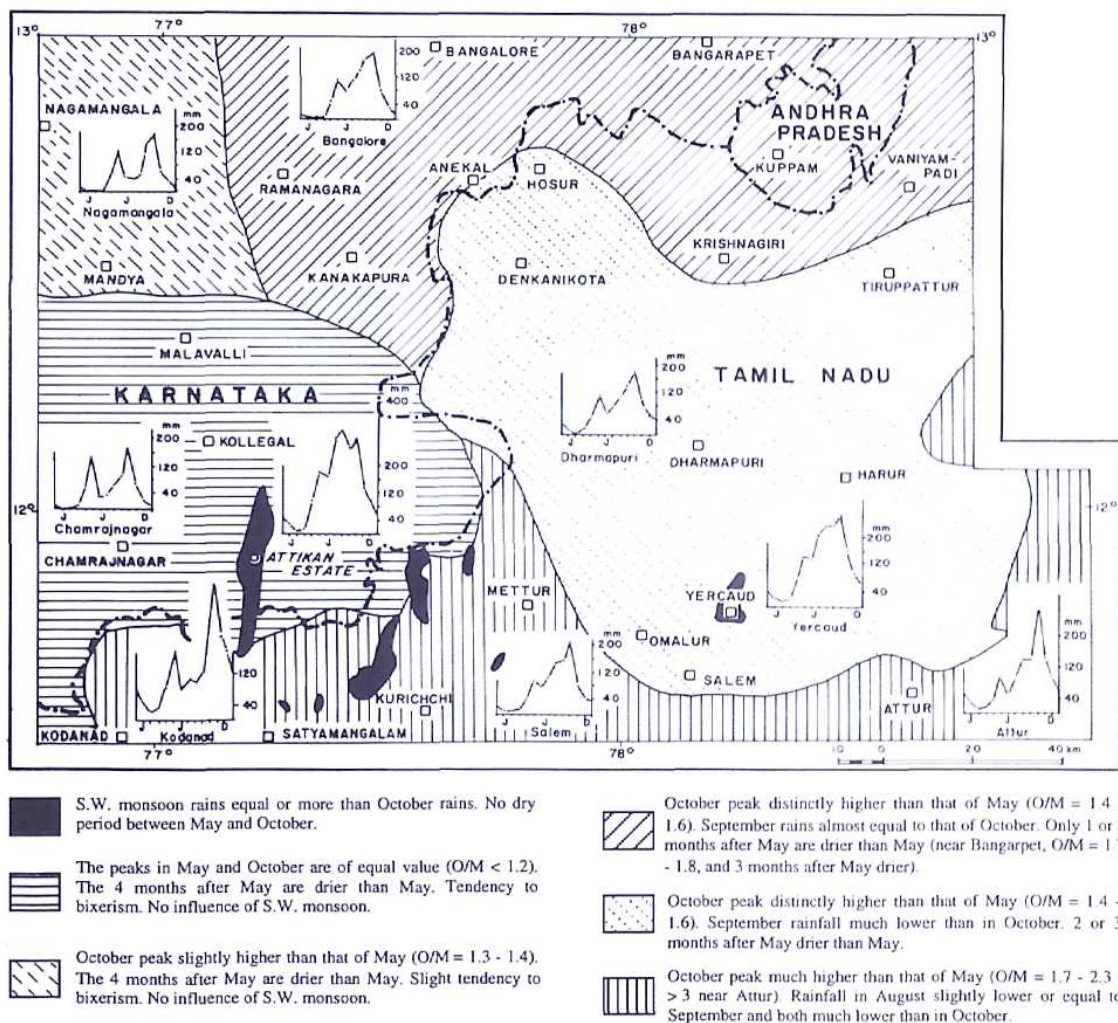


Fig. 5. Rainfall regimes

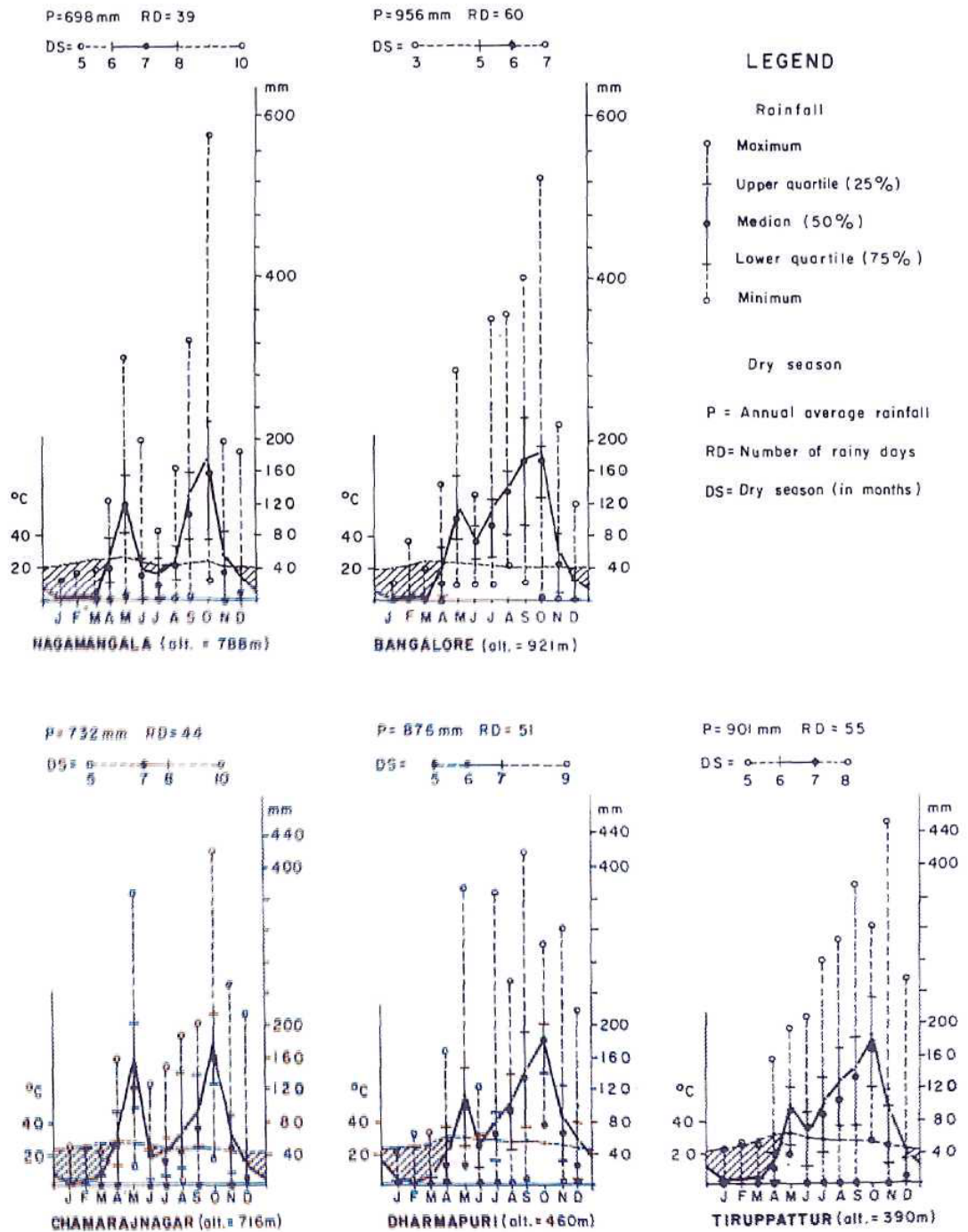


Fig. 6a. Ombrothermic diagrams

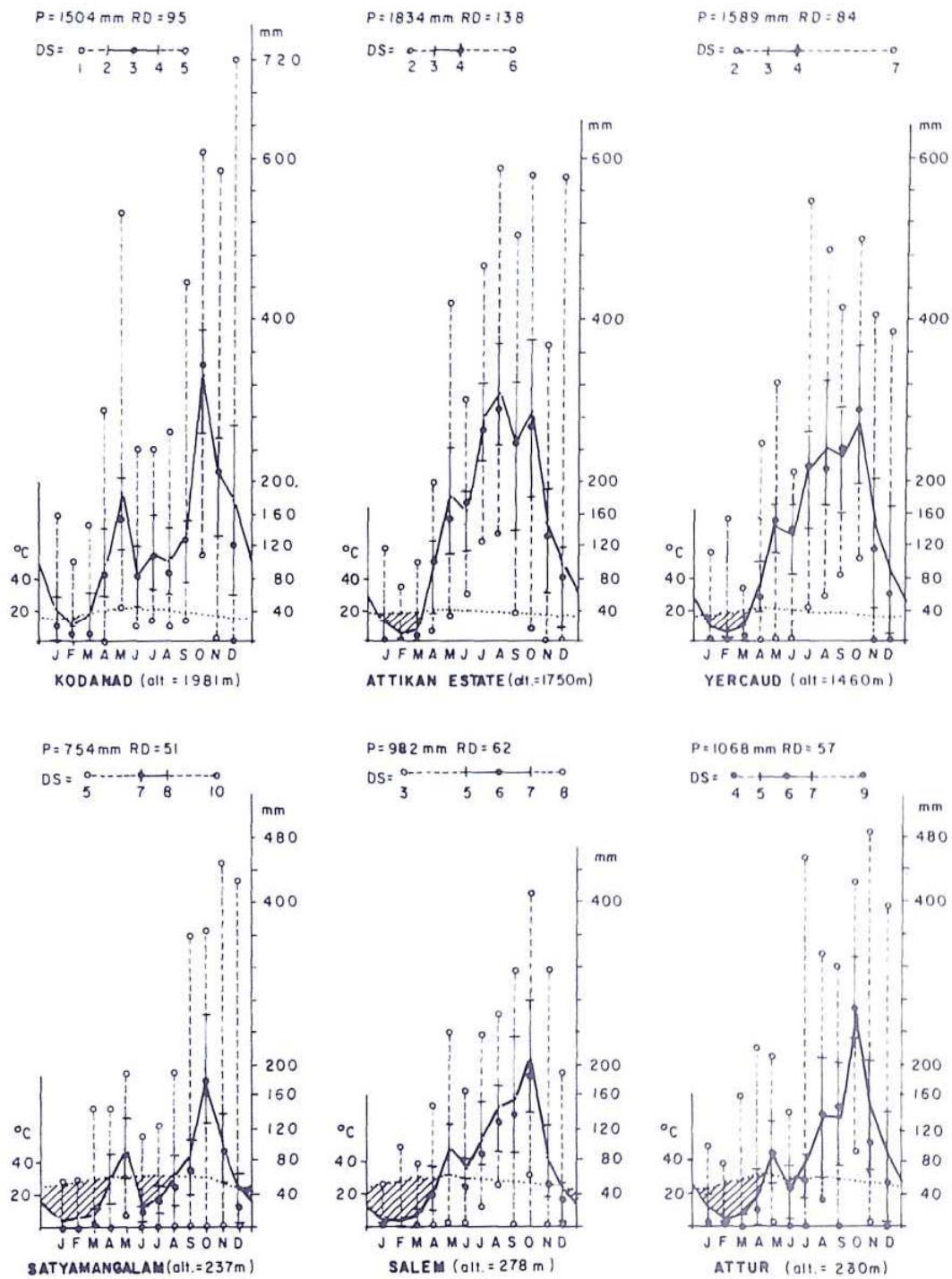


Fig. 6b. Ombrothermic diagrams

part, rainfall is generally from convection movements (peaks in May and September-October) or from depressions which form in the Bay of Bengal towards the end of the year.

a) West-east gradient

The shift towards the east is reflected in the gradual modifications in the relative abundance of rainfall in May and October. The main change observed is the dissymmetry in the peaks in May and September-October. In Chamrajnagar the two peaks are quite similar, while in Bangalore and Dharmapuri the peak in October is one and a half times higher (Fig. 5 and Fig. 6a), and in Salem two times higher (Fig. 6b) than the peak in May.

The equal importance of the two peaks in Chamrajnagar, which is also found in Mysore, is due to its location in the shelter of the reliefs to the east as well as to the west. However, beyond this sheltered location, the dissymmetry becomes apparent at the same longitude (Nagamangala, Fig. 6a).

b) Influence of the year end depressions

From October to December, the regions exposed to the east receive rainfall from depressions originating in the Bay of Bengal and moving towards India. The

formation of these depressions is very variable in number, as well as in intensity, from one year to another. This irregularity can be seen, for example, in the quartiles of Attur, Allikan Estate and Kodanad (Fig. 6b). It is observed that this influence is felt quite far inland as Kodanad is located in the Nilgiris. Besides the convectional rains and the summer monsoon, the BRH and Shevaroy summits also receive rainfall from the depressions of October-November-December.

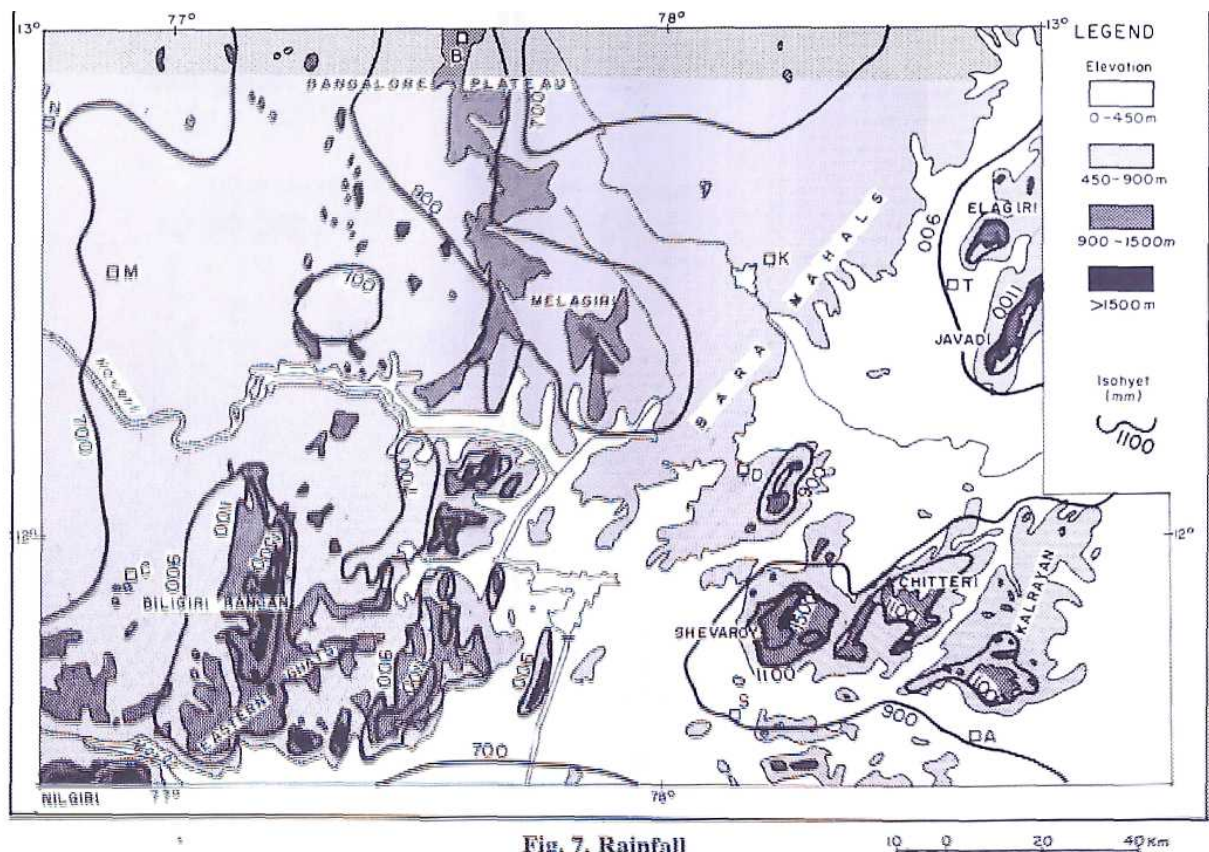
c) North-south variations

Two main trends are observed.

(i) increasing dissymmetry, from north to south, in the May and October peaks which reinforce the west-east gradient. In Attur, located to the southeast, the two gradients are maximum and the October peak is more than three times higher than the one in May. The sheltered Mysore - Chamrajnagar region is a special case as already mentioned.

(ii) increase in the September rainfall with latitude. North of $12^{\circ}30'$, the peaks in September and October are more or less similar.

The region around Dharmapuri (Bara Mahals) is in an intermediate situation, reinforced by its position in the shelter of the Shevaroy, Chitteri, Kalrayan and



Javadi hills. This regime extends slightly over the plateau upto Hosur, following the Tamil Nadu-Karnataka border.

The cumulative influences of these variations and rainfall patterns result in six distinct areas with similar rainfall regimes (shown by different designs in Fig. 5).

2. Annual rainfall

The annual rainfall value is the result of the influences of the different rainfall regimes and particular topographic situations (exposure, altitude). The rainfall distribution is given in Fig. 7. In the mapped region, rainfall varies from about 500 mm to the west of Chamrajnagar to nearly 1900 mm in the Biligiri Rangan Hills (BRH).

The driest areas are situated in the western part of the plateau, the southernmost part of the sheet and in the northeast (around Bangarapet and Kolar Gold Fields). Two more dry pockets are also found on the plateau, as a result of their sheltered location: one to the south of Kanakapura and the other along the Marthahalli river.

Rainfall exceeds 900 mm in the Nilgiris, around BRH, in the most exposed zones of the Eastern Ghats¹, along a crest-line joining Melagiri and Bangalore, and around the Javadi-Elagiri and Shevaroy-Chitteri-Kalrayan hills.

Only the mountain reliefs get rainfall higher than 1100 mm. BRH and Shevaroy are the only two stations where it exceeds 1500 mm; however, it is always less than 2000 mm. The case is the same in the small part of the Nilgiris included in the sheet.

Table 2. Mean temperature (°C)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
Bangalore	20.9	23.0	25.7	27.3	26.8	24.4	23.2	23.3	23.3	23.2	21.8	20.5	23.6
Coonoor	14.0	15.2	17.1	18.7	19.5	18.6	17.9	18.1	17.6	16.9	15.3	14.5	17.0
Dharmapuri	23.0	25.2	27.7	30.3	29.9	28.3	28.0	27.3	26.9	26.0	24.2	22.9	26.7
Kolar Gold Fields	20.2	22.5	25.4	28.0	27.7	25.6	24.8	24.2	24.1	23.3	21.7	20.3	24.0
Mandya	22.2	24.4	26.5	28.4	27.3	25.3	25.1	24.8	25.1	25.1	24.9	22.9	25.2
Mettur Dam	25.3	27.3	30.3	31.6	31.8	30.5	29.3	28.9	28.7	27.7	26.6	24.9	28.6
Salem	25.4	27.0	29.4	31.1	31.2	29.7	28.5	28.3	28.1	27.5	25.8	25.1	28.1
Talavady	23.7	25.1	26.6	27.7	27.3	26.6	25.3	25.8	25.8	25.5	24.8	23.8	25.7
Tiruppattur	22.9	24.8	27.3	29.5	30.5	29.3	28.2	28.1	27.6	26.5	24.2	22.7	26.8
Yercaud	16.0	17.6	20.0	21.7	21.8	20.3	19.1	18.8	18.7	18.1	16.4	15.6	18.6

¹ Geographically, the BRH, the Javadi, Elagiri, Shevaroy, Chitteri and Kalrayan hills form part of the Eastern Ghats. However, we will treat Javadi, Elagiri, Shevaroy, Chitteri and Kalrayan as hills of Tamil Nadu and retain the term Eastern Ghats only for the edge of the Mysore plateau.

II - TEMPERATURE

The huge number of reliefs in this region breaks the monotony of the rainfall distribution. The corresponding temperature gradient enables the development of more humid formations. Rainfall related to orographic effect is augmented by occult precipitations, dew and fog resulting from lower temperatures.

Temperature obviously plays a role in the selection of species. Thus a number of species selected to designate a forest type are species with a narrow altitudinal amplitude-for example, *Gyrocarpus* and *Hardwickia*. Some families, such as Lauraceae, Myrtaceae and Araliaceae, are particularly well developed in the coldest regions.

Temperatures are higher in the plains (Table 2). The mean of the hottest month is 30.3-31.8° C. In the region corresponding to the very dissymmetric rainfall regime (Salem), (the hottest month is May and the maxima exceed a mean value of 29°C during 4 months (March to June). The maximum is in April in stations less exposed to the eastern influence (Dharmapuri). Throughout the plains, the coldest month is December with mean values between 22.7° and 25.1° C.

Temperatures are naturally slightly lower on the plateau. The hottest month is April (27.3°-28.4°C), while the coldest month passes from December to January as we go westwards. This change corresponds to slightly lower temperatures: 20.2°-20.5°C in the east and 22.2°-23.7°C in the west.

At very high elevations, the temperature becomes a limiting factor for several species. In Coonoor and Yercaud, the mean minimum (in January) is between 14.5° and 15.6° C, while the mean maximum (in May) is around 20° C (19.5-21.8).

III -DRY SEASON

The length of the dry season is another limiting factor for the vegetation. It plays an important role in the selection of species and, consequently, in the distribution of the main vegetation types.

Taking into account the limitations in the data available for accurately measuring the intensity of dryness, the dry season was calculated following Gaussen and Bagnoul's (1953) method: a month is considered dry when the rainfall (in mm) is less than twice the value of the mean temperature (in C). The ombrothermic diagrams (Fig. 6a,b), where the ordinates were established according to this ratio, help in immediately recognizing the dry months. A slightly more accurate estimate can be made by calculating the number of dry months separately for each year. The average thus obtained is generally higher than that seen in ombrothermic diagrams which have a tendency to underestimate interannual variations. Fig.6 also gives the variations in the monthly rainfall and in the number of dry months in the form of quartiles.

In the major part of the sheet, the dry season thus calculated ranges from 6 to 8 months. It is generally 7 to

8 months in regions with low rainfall (less than 700 mm) and 5 to 6 months when the rainfall exceeds 900 mm. It is only on the highest reliefs (Nilgiris, BRH, Shevaroy) that the dry season is limited to 3 or 4 months.

However, these mean values should not mask the large interannual variations. Thus, in Satyamangalam and Chamrajnagar, the dry season in 50% of the years is 7-8 months, but the extreme values vary between 5 and 10 months, *i.e.*, from simple to double. In Kodanad, in the Nilgiris, the extremes are 1 to 5 months. It is therefore clear that such constraining factors impose a very strict selection on plant species.

Another aspect to be considered in this region is the frequency of bixerism. With the exception of the crest on the plateau from the Melagiris to Bangalore, the BRH and summits of the Eastern Ghats, all the regions experience a second period of dryness after May. This period, generally 1-2 months (2-3 in the west), varies in duration and intensity from one region to another, and also from year to year, but on the average, it is observed in 6 out of 10 years.

The climatic conditions described above lead to certain adaptations in the natural vegetation, such that the major bioclimatic limits of the principal vegetation types found in the sheet can be distinguished quite easily. Naturally, some formations such as the riparian forests, for example, are found only under certain edaphic conditions and do not fit with these climatic limits.

These bioclimatic limits are described at the beginning of the study of each type.

Chapter III

VEGETATION TYPES

I - DRY VEGETATION TYPES

A. *Albizia amara* - *Acacia* spp. type

This type greatly exceeds the limits of the Bangalore - Salem sheet. It covers most of the dry regions of the plains and hills of low elevation (less than 600 m) of Tamil Nadu (Gaussen *et al.* 1961a,b, 1962, 1963: Cape Comorin and Madras sheets). It also appears in the driest regions of the Mysore plateau (rainfall about 450 to 600 mm). However, it is not found on calcimorphic soils (Gaussen *et al.* 1966).

In the Bangalore - Salem sheet, it is found on the plains up to the foot of the hills, except for a part of Bara Mahals where it seems to be replaced by the *Anogeissus* - *Chloroxylon* - *Albizia* type. Nevertheless, it is difficult to distinguish these two types precisely, as they are both highly degraded and represented now by almost similar formations. The *Albizia* - *Acacia* type is again found on the plateau, in a small dry zone around Bangarapet, where the rainfall is less than 600 mm.

The rainfall regime corresponding to its distribution area is strongly dissymmetric with the rainfall peak in October distinctly higher than the one in May, for example, Satyamangalam (Fig. 6b). Rainfall generally varies between 600 and 1000 mm and the dry period from 6 to 8 months, spread over two seasons: a long season from December to April and a shorter one, of 1 to 3 months, after May.

Most often this type is represented by more or less degraded thickets, generally distant from one another and surrounded by cultivated land. These formations have resulted from intense and continuous biotic pressure acting on them since centuries. However, in some cases, especially at the foot of the hills, the *Albizia* - *Acacia* type is still found as scrub-woodland, a physiognomic stage which is now difficult to specify whether it represents the *climax* of the type or not.

In a general way, the *Albizia* - *Acacia* type is replaced on the slopes by the *Gyrocarpus* - *Acacia* type with which it shares a large number of species.

The description of this type is that of Gaussen *et al.* (1963), complemented by a few additions from our own surveys.

1. Scrub - woodland

These formations include an upper stratum 10 to 12 m high, generally composed of deciduous species, and an undergrowth of thorny shrubs and climbers which is sometimes almost impenetrable. A grass cover is present between the shrubs, specially in the clearings.

- Tree stratum

*Acacia chundra*¹

Acacia leucophlœa

Albizia amara

Azadirachta indica

Canthium dicoccum

Chloroxylon swietenia

Cleistanthus collinus

Erythroxylon monogynum

Strychnos potatorum

Wrightia tinctoria

Ziziphus mauritiana

Ziziphus xylopyrus

- Understorey

Acacia ferruginea

Acacia latronum

Atalantia monophylla

Benkara malabarica

Canthium dicoccum

Capparis divaricata

Carissa spinarum

Catunaregam dumetorum

Commiphora berryi

Dichrostachys cinerea

Euphorbia antiquorum

Flacourtia indica

Gmelina asiatica

Lantana camara

Maytenus emarginata

Pterolobium hexapetalum

Securinega leucopyrus

Tarenna asiatica

- Small shrubs and grass cover:

Acalypha fruticosa

Aristida adscensionis

Aristida hystrix

Barleria buxifolia

Cassia auriculata

¹ The most common species are indicated in bold..

Dodonaea viscosa

and under moderate grazing:

Aristida funiculata

Eragrostiella bifaria

Heteropogon contortus

Tragus biflorus

2. Dense thicket

This formation is derived from the preceding one by degradation. Species which provide timber and fuel-wood, specially *Albizia amara*, *Chloroxylon swietenia*, *Azadirachta indica* and *Wrightia tinctoria*, have been overexploited. This degradation results in drier conditions favouring the growth of spiny and climbing species such as *Pterolobium indicum* and *Acacia pennata*. The ground is covered by an impenetrable undergrowth composed of shrubs about 4 m high, with a few isolated trees.

The floristic composition is more or less the same as that of the undergrowth of scrub-woodlands. The dominant species are:

Acacia pennata

Albizia amara

Canthium dicoccum

Capparis divaricata

Catunaregam dumetorum

Chloroxylon swietenia

Dichrostachys cinerea

Flacourtia indica

Maytenus emarginata

Pterolobium

hexapetalum

Securinega leucopyrus

Ziziphus xylopyrus

3. Discontinuous thicket to low scattered shrubs

The low discontinuous thicket is still more degraded than the preceding stage and is heavily grazed. It is easy to move between these 2-4 m high, thick thorny shrubs. Thornless and edible species grow in the middle of these bushes, away from the reach of animals. A few isolated trees emerge in some places. Climbing and thorny species are abundant and a sparse grass cover is found between the shrubs.

Increasing degradation gradually leads to the last stage: scattered shrubs. The soil is then highly exposed to erosion, and has only a thin graminaceous cover of *Aristida adscensionis*, *A. hystrix* and sometimes *Cymbopogon coloratus*. A few scattered undershrubs are found:

Barleria buxifolia

Calotropis gigantea

Cassia auriculata

Dodonaea viscosa

Euphorbia antiquorum

Euphorbia tirucalli

Opuntia dillenii

On steep and eroded slopes, there is hardly any vegetation left between the rocks. *Aristida hystrix* is very scattered and the shrubs are also far apart.

B. *Gyrocarpus jacquini* and/or *Hardwickia binata* types

Formations on the slopes from the foothills up to elevations of 600 to 700 m are grouped under this type. *Gyrocarpus* type is found from the southern tip of India on the eastern slopes of the Ghats up to northwest of Madras on poor, most often skeletal, soils.

On the sheet, these formations occupy most of the lower slopes of the Eastern Ghats and the hills of Tamil Nadu. They are also found on the steep slopes of the valleys of the Kaveri and its tributaries where they form the transition to the *Anogeissus* - *Chloroxylon* - *Acacia* type which generally succeeds them in altitude.

The *Gyrocarpus* type has a large number of species in common with the *Albizia* - *Acacia* type and, in the highest parts, some species of the next type. This type is well characterised by the presence of *Gyrocarpus jacquini* which is often very common.

On the slopes and in the valleys of the Eastern Ghats², *Gyrocarpus* is associated with *Hardwickia binata* which also seems to be adapted to skeletal soils and hardly grows above 800 m. *Hardwickia* is less common on the slopes of the eastern hills (Shevaroy, Kalrayan, Javadi).

The formations found on the part of the plateau dominating the valleys of the Kaveri and its tributaries (for example, Madeshwaramalai plateau) where *Hardwickia* and *Gyrocarpus* are still found, have been included in this type. However, *Gyrocarpus* becomes increasingly rare and then disappears completely as we go towards the interior of the plateau. The forest type then corresponds to the *Hardwickia* - *Anogeissus* series described by Gaussen *et al.* (1966) which we have not identified separately here.

At the northern limit of the sheet (in the Bangarapet region) begins the *Hardwickia* - *Pterocarpus santalinus* - *Anogeissus* series (described by Gaussen *et al.* 1962, 1963) whose area extends far north up to 17° N. We have not recognised this series as it is represented here only by a few thickets which are, moreover, highly degraded.

The intensity of biotic pressure has resulted in the disappearance of large areas of other formations in the

² See footnote Chapter II

plains and on the plateau. On the other hand, the *Gyrocarpus* and *Hardwickia* types are relatively better protected as they are generally found occupy in a less accessible sites. On the plateau, in the one and same zone, are found thorny/spiny thickets of *Anogeissus* - *Chloroxylon* - *Albizia* type on flat terrain, whereas on steep slopes, where man and cattle have no easy access, prevail savanna-woodland or tree savanna with *Hardwickia*. Topography seems to play an important role in separating the *Anogeissus* - *Chloroxylon* - *Albizia* and *Hardwickia* types.

These formations receive rainfall between 500 and 900 mm, with a very dissymmetric distribution in the September-October and May rainfall. This dissymmetry gradually disappears towards the interior of the plateau, which also corresponds to the disappearance of *Gyrocarpus*. The number of dry months is 6-8 months, most often distributed over two periods. Considering the exposure and low water retaining capacity of the soils which are generally skeletal, this dry period actually corresponds to intense drought conditions aggravated by a wide inter-annual variability.

1. Scrub-woodland and thicket

The *Gyrocarpus* - *Hardwickia* type is most often found as scrub-woodland or thicket which may be low and discontinuous when degradation is more intense. The physiognomies are comparable to those described in the preceding type. Generally the tree stratum is clear and the trees are stunted and less than 15 m high.

The best represented species in this type are:

Boswellia serrata
Cochlospermum religiosum
Commiphora caudata
Givotia rottleriformis
Gyrocarpus jacquini
Hardwickia binata
Sterculia urens

Most of the other common species belong to the *Albizia* - *Acacia* type though there are some coming from the deciduous forest type located higher up in elevation:

Abrus precatorius
Acacia chundra
Acacia caesia
Acacia latronum
Acacia leucophlæa
Albizia amara
Albizia odoratissima
Anogeissus latifolia
Azadirachta indica

Barleria acuminata
Bombax ceiba
Bridelia crenulata
Butea parviflora
Calotropis gigantea
Canthium parviflorum
Cardiospermum halicacabum
Catunaregam dumetorum
Chloroxylon swietenia
Chukrasia tabularis
Cissus quadrangularis
Cordia monoica
Dalbergia paniculata
Dendrocalamus strictus
Dichrostachys cinerea
Diospyros melanoxylon
Dodonaea viscosa
Dolichandrone falcata
Ehretia pubescens
Embllica officinalis
Erythroxylon monogynum
Euphorbia antiquorum
Euphorbia nivulia
Ficus mollis
Gardenia latifolia
Garuga pinnata
Hiptage benghalensis
Lannea coromandelica
Lantana camara
Limonia acidissima
Maytenus emarginata
Polyalthia cerasoides
Premna tomentosa
Pterocarpus marsupium
Pterolobium hexapetalum
Rhus mysorensis
Santalum album
Sapindus emarginatus
Sarcostemma acidum
Schleichera oleosa
Securinega leucopyrus
Strychnos potatorum
Tarenna asiatica
Terminalia bellerica
Vitex altissima
Wrightia tinctoria
Wrightia tomentosa
Ziziphus mauritiana
Ziziphus ænoplia
Ziziphus xylopyrus

In the low and discontinuous thickets, some species such as *Hardwickia* and *Anogeissus* are not found any more, while the formation becomes richer in thorny and climbing plants.

2. Savanna-woodland and tree savanna

On the plateau, a little away from the eastern influence, besides the scrub-woodlands and thickets are found more open formations with a bigger and practically continuous grassy cover which may be considered as savanna-woodlands or tree savanna depending on the tree density. The trees are stunted and rarely exceed a height of 10 m in savanna-woodlands and 8 m in tree savannas. The main species are:

Acacia chundra
Acacia leucophlœa
Albizia amara
Anogeissus latifolia
Boswellia serrata
Butea monosperma
Cassia auriculata
Cassia fistula
Catunaregam dumetorum
Chloroxylon swietenia
Dalbergia paniculata
Diospyros melanoxylon
Dodonaea viscosa
Dolichandrone atrovirens
Dolichandrone falcata
Emblica officinalis
Erythroxylon monogynum
Flacourtia indica
Gardenia latifolia
Grewia tiliifolia
Hardwickia binata
Holoptelea integrifolia
Lannea coromandelica
Maytenus emarginata
Premna tomentosa
Pterocarpus marsupium
Securinega leucopyrus
Sterculia urens
Stereospermum personatum
Tarennia asiatica
Wrightia tinctoria
Ziziphus xylopyrus

Among the grasses:

Aristida adscensionis
Aristida hystrix
Cymbopogon martini
Heteropogon contortus

C. *Anogeissus latifolia* - *Chloroxylon swietenia* - *Albizia amara* type

This type occupies an intermediate position between the preceding type and the *Anogeissus* – *Pterocarpus* –

Terminalia (APT) type. It is generally found between 600 and 900 m, but can sometimes go up to 1200 m under slightly drier conditions.

Because of its altitudinal range, it can actually extend only over the plateau. If present, it constitutes just a brief transition between the *Gyrocarpus* - *Hardwickia* and *Anogeissus* - *Pterocarpus* - *Terminalia* types over steep slopes.

On the plateau, its area occupies the western part of the sheet up to the foot of the Biligiri Rangan Hills where, at about 900 m, it is followed by the APT or *Anogeissus* - *Tectona* - *Terminalia* (ATT) types. This type also stops at the level of the more humid crest between Bangalore and the Melagiris. It is found again to the east of this region along the edge of the plateau except for the dry pocket (already mentioned) near Bangarapet. The presence of *Anogeissus* in the Bara Mahals at the foot of the Eastern Ghats leads to the supposition that, in this region, it may also be found at lower elevations. However, this cannot be stated categorically because of the highly degraded condition of the relic formations.

According to Gaussen *et al.* (1966) the area of this type extends northwards up to a latitude slightly above Belgaum.

This distribution area corresponds to rainfall between 600 and 900 mm. The rainfall regime does not seem to play a determining role because this type is found in regions where the rainfall peaks of September-October and May are highly dissymmetric (like in Nagamangala, Fig. 6a), as well as in places where the two peaks are similar (Chamrajnagar). The number of dry months varies between 6 and 8 months in two periods in the mapped region.

It is difficult to know now what would have been the *climax* of this type. Under the joint onslaught of drought and exploitation for fuelwood, the best stands rarely attain the physiognomy of savanna-woodland. Away from the hills, only increasingly degraded stages, from thickets to low scattered shrubs are found.

1. Savanna-woodland to tree savanna

All the intermediates between these two stages are present, with physiognomies similar to those described in the preceding type.

- Tree stratum (about 10 m high)

Aegle marmelos
Albizia amara
Anogeissus latifolia
Azadirachta indica
Bauhinia racemosa
Buchanania axillaris
Cassia fistula

Chloroxylon swietenia
Dalbergia paniculata
Dendrocalamus strictus
Diospyros melanoxylon
Dolichandrone falcata
Emblica officinalis
Holarrhena antidysenterica
Holoptelea integrifolia
Lannea coromandelica
Limonia acidissima
Madhuca longifolia var. *latifolia*
Premna tomentosa
Stereospermum personatum
Strychnos potatorum
Wrightia tinctoria

On the slopes, *Gyrocarpus jacquini* and *Cochlospermum religiosum* can be found, but they are not very common.

- Undergrowth

Acacia chundra
Acacia latronum
Argyrea cuneata
Canthium dicoccum
Carissa spinarum
Catunaregam dumetorum
Cipadessa baccifera
Diospyros melanoxylon
Diospyros montana
Dodonaea viscosa
Erythroxylon monogynum
Gmelina asiatica
Ixora arborea
Mundulea sericea
Rivea hypocrateriformis
Securinega leucopyrus

- Graminaceous cover

Aristida adscensionis
Aristida hystrix
Chrysopogon fulvus
Heteropogon contortus

2. Dense thicket to low scattered shrubs

These degradation stages are the result of abusive and continuous exploitation of wood which has practically removed the tree stratum. The resulting increase in dryness at the level of the undergrowth and overgrazing favour the growth of thorny species. Among the most common species may be cited:

Acacia chundra
Acacia latronum
Albizia amara
Anogeissus latifolia (shrub form)

Apluda varia
Aristida hystrix
Barleria prionitis
Canthium dicoccum
Cassia auriculata
Catunaregam dumetorum
Chloroxylon swietenia
Cymbopogon martini
Dichrostachys cinerea
Dodonaea viscosa
Erythroxylon monogynum
Euphorbia antiquorum
Heteropogon contortus
Ixora arborea
Lantana camara
Limonia acidissima
Maytenus emarginata
Phoenix humilis
Pterolobium hexapetalum
Rhus mysorensis
Santalum album (some times quite common)
Securinega leucopyrus
Strychnos potatorum
Tarenna asiatica
Ziziphus aenoplia

Under intense biotic pressure, these dense thickets are reduced to discontinuous thickets whose shrubs are separated by large barren areas. In the ultimate stage, only a few shrubs which are inedible for animals are left on the denuded sites

D. *Anogeissus latifolia* - *Pterocarpus marsupium* - *Terminalia* spp. type

This type includes formations which resemble the *Anogeissus* – *Tectona* - *Terminalia* spp. (ATT) type, but differs from it in that here teak is usually rare under natural conditions (its presence is indicated on the map by the letter T).

These formations are found between 900 and 1350 m on the slopes of the Biligiri Rangan Hills and of the reliefs of the Eastern Ghats and hills of Tamil Nadu (Shevaroy, Kalrayan, etc.). Similar formations are also found in the more humid zone of the plateau connecting Guttirayan, Melagiris and Bangalore.

Rainfall is higher than 900 mm, and often between 1100 and 1400 mm. The rainfall regime is dissymmetric, except for a part of BRH, with practically no summer monsoon rains. This difference may be essential for the richness in teak because in the three sheets situated in the west (Belgaum-Dharwar-Panaji, Shimoga and Mercara-Mysore), the ATT type is always found in

regions with a rainfall regime strongly dominated by rains in June-July. The dry season is 5-6 months.

Most often, the type is represented by savanna-woodlands or tree savannas. A true dense deciduous forest is rare and is found only as small patches in the more humid valleys which are relatively protected from human interference. In regions where biotic pressure is intense, the type is degraded into scrub-woodland, and then increasingly to low and discontinuous thickets.

1. Savanna-woodland to tree savanna

The physiognomies are the same as those of similar formations in the other types.

- Upper stratum

Albizia odoratissima
Anogeissus latifolia
Bauhinia purpurea
Bauhinia racemosa
Bombax ceiba
Buchanania lanzan
Butea monosperma
Careya arborea
Celtis tetrandra
Dalbergia latifolia
Dalbergia paniculata
Ficus microcarpa
Ficus tsihela
Garuga pinnata
Gmelina arborea
Grewia tiliifolia
Holoptelea integrifolia
Hymenodictyon excelsum
Kydia calycina
Lagerstræmia parviflora (rare)
Premna tomentosa
Pterocarpus marsupium
Schleichera oleosa
Schrebera swietenoides
Sterculia guttata
Sterculia villosa
Stereospermum personatum
Syzygium cumini
Tectona grandis (rare)
Terminalia alata
Terminalia bellirica
Terminalia chebula (locally abundant)
Terminalia paniculata
Toona ciliata

- Intermediate stratum

Bridelia retusa
Canthium
dicoccum
Casearia elliptica

Cassia fistula

Catunaregam torulosa
Chukrasia tabularis
Clausena indica
Dendrocalamus strictus
Diospyros montana
Emblica officinalis
Eriolæna hookeriana
Glochidion velutinum
Litsea deccanensis
Mallotus philippensis
Meyna laxiflora
Radermachera xylocarpa
Streblus asper
Wrightia tinctoria
Ziziphus rugosa

-Undergrowth

Argyrea cuneata
Breynia rhamnoides
Cipadessa baccifera
Clerodendrum serratum
Flemingia macrophylla
Grewia hirsutus
Helicteres isora
Indigofera cassioides
Leea chinensis
Mæsa indica
Munronia pinnata
Pavetta tomentosa
Phœnix humilis
Polygala arillata
Tarenna asiatica

The most common grasses are:

Cymbopogon nardus
Themeda cymbaria.

Boswellia serrata, *Givotia rottleriformis* and *Sterculia urens* are sometimes found in the transition to the *Gyrocarpus* type.

Shorea roxburghii is sometimes found in pure patches, generally on shallow clayey soil (for example, in Tali RF (Housur Range) and also in Chitteri Hills).

2. Dense thicket to low scattered shrubs

The main tree species in a stunted form are:

Acacia leucophlæa
Albizia amara
Anogeissus latifolia
Buchanania lanzan
Chloroxylon swietenia
Dalbergia paniculata
Grewia tiliifolia
Premna tomentosa

Pterocarpus marsupium
Terminalia alata

In the bushy stratum are found most of the species cited in the preceding types:

Acacia chundra
Carissa carandas
Catunaregam torulosa
Cipadessa baccifera
Clematis gouriana
Dodonaea viscosa
Erythroxylon monogynum
Flacourtia indica
Lantana camara
Pterolobium hexapetalum
Santalum album (locally quite common)
Tarenna asiatica

E. *Anogeissus latifolia* - *Tectona grandis* - *Terminalia alata* type

This type is practically absent in this region. It is found only in a small zone, richer in teak, on the western flank of the BRH, between 900 and 1200 m and in some tree savannas on the northern slope of the Nilgiris, at elevations below 1100 m. In all other places, the density of teak is too low to relate the formations to this type.

A more detailed description is given in the explanatory booklet (Pascal 1986). Only the most common species are cited here.

- Dominant stratum

Albizia lebbek
Albizia odoratissima
Anogeissus latifolia
Bombax ceiba
Buchanania lanzan
Dalbergia latifolia
Dalbergia paniculata
Garuga pinnata
Haldina cordifolia
Holoptelea integrifolia
Lagerstræmia parviflora
Lannea coromandelica
Pterocarpus marsupium
Schrebera swietenoides
Shorea roxburghii (localised)
Stereospermum personatum
Tectona grandis
Terminalia alata
Terminalia chebula
Terminalia paniculata

- Intermediate stratum

Bauhinia racemosa
Bridelia retusa

Butea monosperma
Careya arborea
Cassia fistula
Dendrocalamus strictus
Diospyros melanoxylon
Emblica officinalis
Flacourtia indica
Gmelina arborea
Grewia tiliifolia
Holarrhena antidysenterica
Ougeinia oojenensis (localised)
Wrightia tinctoria

- Undergrowth

Acacia chundra
Canthium dicoccum
Carissa congesta
Casearia elliptica
Catunaregam torulosa
Diospyros montana
Helicteres isora
Lantana camara
Leea asiatica
Maytenus emarginata
Mundulea sericea
Thespesia lampas
Ziziphus ænoplia
Ziziphus rugosa

-Ground cover: herbs, small sized shrubs and grasses

Achyranthes aspera
Apluda mutica var. *aristida*
Aristida hystrix
Bidens biternata
Chromolaena odorata
Crotalaria calycina
Crotalaria hirsuta
Crotalaria sericea
Cymbopogon coloratus
Cymbopogon confertiflorus
Cymbopogon martini
Desmodium pulchellum
Elephantopus scaber
Gomphostemma heyneanum
Grewia hirsuta
Heteropogon contortus
Hibiscus furcatus
Indigofera wightii
Justicia simplex
Leucas marruboides
Ophiopogon intermedius
Sida acuta
Themeda triandra.

II - MOIST VEGETATION TYPES

A. Low elevation (below 1000 m)

Moist formations at low elevations are poorly represented on the sheet. In fact, except for some special situations, the general climatic conditions are not conducive for their spread, and human activities further contribute to their reduction. They are thus found only in the valleys. The best formations are on the western slopes of the Biligiri Rangan Hills; elsewhere, they are most often confined to river banks, in the most inaccessible regions.

Terminalia arjuna - *Syzygium cumini* - *Pongamia riparian* type

Under best conditions, this type occurs as forest galleries with a top canopy often exceeding 20 m. The stratification underneath is distinctly 3 or 4 layered. Big buttressed trees can also be seen near streams. However, the canopy does not generally exceed 15 m and the stratification below is not clearly defined.

Among the most common species are:

- Dominant stratum

Anthocephalus cadamba
Celtis tetrandra
Chukrasia tabularis
Madhuca longifolia
Mangifera indica
Pongamia pinnata
Salix tetrasperma
Spondias pinnata
Syzygium cumini
Terminalia arjuna
Toona ciliata

- Understorey

Atalantia monophylla
Homonoia riparia (on river bed)
Vitex leucoxydon

- Undergrowth includes

Glycosmis pentaphylla
Salix sp.

B. Medium elevation (altitude 750-1400 m)

The area of the formations at medium elevations is very limited as seen on the map. They are found naturally on the reliefs, most often in the form of forest patches subject to intense anthropic pressure. Very often their

area is too small to be depicted on a map at this scale (250m = 1 mm).

1. *Elaeocarpus tuberculatus* - *Michelia champaca* - *Canarium strictum riparian* type

Narrow strips of tall evergreen forests are encountered along streams in the middle of deciduous forests. They depend on the high moisture content of the soil.

These ripicole forests are found between 1000 and 1400 m. They are more common on the slopes of BRH and the Eastern Ghats than on the hills dominating the plains of Tamil Nadu, and better developed on the western slopes than on the eastern slopes. Sometimes, they are gradually replaced towards lower elevations by the preceding type. At higher elevations, they constitute only a facies of evergreen forests. In areas having good drainage, they are usually replaced by the *Diospyros* - *Memecylon* - *Olea* type.

It is in this kind of formation that we find a remarkable tree of *Michelia champaca*, worshipped for its great antiquity. Located in Gundal Valley (BRH), this pluricentenary tree attracts devotees from distant places. The Reserved Forest in which this tree is found is named after the vernacular Kannada name of this species, Dodda Sampige.

A detailed description of this type is given in Ramesh (1989), from which the floristic list given in the Annexe is also taken. Four arborescent strata and one shrubby and herbaceous stratum are recognized. The tallest trees such as *Elaeocarpus tuberculatus* and *Salix tetrasperma* exceed 25 m. The remaining species of the upper stratum are between 20 and 25 m.

Only the important species of the different structural ensembles are given below:

- Upper stratum

Acrocarpus fraxinifolius
Aphanamixis polystachya
Bischofia javanica
Canarium strictum
Cassine glauca
Dimocarpus longan
Elaeocarpus serratus
Elaeocarpus tuberculatus
Ficus nervosa
Ficus tsjahela
Ficus virens
Mangifera indica
Meliosma pinnata ssp. *arnottiana*
Michelia champaca
Persea macrantha
Salix tetrasperma
Syzygium cumini
Toona ciliata

A few deciduous species are sometimes found in this stratum; however, they are less common:

Celtis tetrandra
Dalbergia latifolia
Grewia tiliifolia
Pterocarpus marsupium
Stereospermum personatum
Terminalia alata

- Dominant strata:

Actinodaphne lawsonii
Antidesma menasu
Canthium dicoccum
Casearia ovata
Cinnamomum sulphuratum
Cinnamomum travancoricum
Cryptocarya neilgherrensis
Euodia lunu-ankenda
Ficus mollis
Ficus racemosa
Litsea floribunda
Mallotus philippensis
Neolitsea zeylanica
Olea glandulifera
Phaëbe paniculata
Viburnum punctatum
Xantolis tomentosa

Several species are found only in openings where they are also more abundant:

Callicarpa tomentosa
Chionanthus ramiflora
Clerodendrum viscosum
Glochidion velutinum
Macaranga peltata
Mallotus tetracoccus
Meyna laxiflora
Sterculia guttata

A few deciduous species are also found, most often at the edges or in openings:

Careya arborea
Cassia fistula
Emblica officinalis
Erythrina stricta
Kydia calycina

- Undergrowth:

Ardisia solanacea
Atalantia wightii
Cipadessa baccifera
Clausena indica
Cocculus laurifolius
Eriolæna hookeriana
Helicteres isora

Mæsa indica
Nothapodytes fætida
Psychotria elongata
Psychotria nigra
Symplocos cochinchinensis
Syzygium malabaricum (swampy habitats)
Ziziphus rugosa

- Shrubs and herbaceous layer

Paucity of species in this stratum may be attributed to rocky outcrops and eroded soils. Common shrubs and herbs found are:

Arisæma sp.
Chasalia ophioxylodes
Cipadessa baccifera
Elatostema lineolatum
Globba bulbifer
Munronia pinnata
Pavetta indica
Polygonum chinensis

- Climbers

Allophylus cobbe
Asparagus racemosus
Calamus gamblei
Carissa inermis
Diploclisia glaucescens
Entada pursætha
Gnetum ula
Hiptage benghalensis
Jasminum azoricum
Mezoneuron cuculatum
Peperomia sp.
Piper hymenophyllum
Scutia myrtina
Toddalia asiatica var. *floribunda*

2. *Mesua ferrea* - *Palaquium ellipticum* - *Olea glandulifera* evergreen forest type

This type is represented only by a forest patch of 0.5 km² in the Gundal Valley in the BRH, at an elevation of 1300-1400 m. It has, nevertheless, been classified as a type because of the originality of its floristic composition which expresses both the western and eastern influences. In fact, this is the eastern limit for a large number of characteristic species of the Western Ghats, such as *Mesua ferrea* and *Palaquium ellipticum*. Characteristic species of the eastern slopes, like *Olea glandulifera*, are found growing along with them.

Ramesh (1989) has made a detailed study of this type. The basal area and height of the formation are quite comparable to those of the dense evergreen forests of the Western Ghats. Floristic richness is also high, as 107 tree species have been enumerated. However, the

density is less, probably a consequence of human interference, which is also expressed in the richness of species characteristic of openings (the forest patch is adjacent to a coffee estate). This relic forest is thus in imminent danger of disappearing.

Only species which are very common or interesting from the phytogeographic point of view are cited here. The complete floristic list is given in the Annexe.

Emergents and upper canopy trees :

Aglaia jainii
Beilschmiedia wightii
Canarium strictum
Casearia ovata
Cinnamomum keralense
Dimocarpus longan
Diospyros ovalifolia
Diospyros sylvatica
Elæocarpus serratus
Epiprinus mallotiformis
Ficus nervosa
Litsea oleoides
Mesua ferrea
Myristica dactyloides
Neolitsea zeylanica
Palaquium ellipticum
Persea macrantha
Phæbe paniculata
Toona ciliata

- Middle storey:

Actinodaphne bourdillonii
Agrostistachys meeboldii
Aphanamixis polystachya
Artocarpus heterophyllus
Bischofia javanica
Cinnamomum malabathrum
Cryptocarya neilgherrensis
Euodia lunu-ankenda
Isonandra perrottetiana
Litsea floribunda
Macaranga peltata
Meliosma simplicifolia var. *pungens*
Olea glandulifera
Sterculia guttata

- Understorey:

Antidesma menasu
Ardisia pauciflora
Chionanthus ramiflora
Clerodendrum viscosum
Mallotus philippensis
Mallotus stenanthus
Mallotus tetracoccus
Meiogyne pannosa
Neopeltandra longipes

Syzygium hemisphericum
Villebrunea integrifolia

- Shrubs and herbaceous layer:

Arisæma sp.
Atalantia wightii
Clausena dentata
Elatostema lineolatum
Nilgirianthus barbatus
Ophiopogon intermedius
Psychotria elongata

- Climbers:

Allophylus cobbe
Calamus gamblei
Carissa inermis
Gnetum ula
Hiptage benghalensis
Piper sp.
Toddalia asiatica var. *floribunda*
Zanthoxylum tetraspermum

3. *Diospyros ovalifolia* - *Memecylon lushingtonii* - *Olea glandulifera* evergreen to semi-evergreen forest type

This type is characterised by the abundance of species typical of the Eastern Ghats, like the three species used to designate the type. Another distinguishing feature of this type is the absence of some of the characteristic species of the Western Ghats, such as *Mesua ferrea*, *Miclielia champaca* and *Palaquium ellipticum*.

It is found in the valleys of the Eastern Ghats, on the hills of Tamil Nadu and the eastern flank of BRH, with rainfall of 900 to 1200 mm and at elevations generally between 1100 and 1400 m. Above this elevation, it is succeeded by a transitional formation dominated by Lauraceae.

Generally it occurs as forest patches which are sometimes quite dense. However, very often their size is too small to be mapped at this scale. Thus this type is not shown in the western part of the Kalrayan Hills or on the Javadi hills, although some small pockets of forests can still be found there.

Physiognomically, it occurs as low forest with trees seldom higher than 15 m, often quite degraded by man. The height of the formation gradually decreases towards the margin. There is no distinct stratification under the canopy.

The main species are:

- Canopy trees

Aglaia roxburghiana
Aphanamixis polystachya
Bischofia javanica (along streams)

Canthium dicoccum

Celtis timorensis

Diospyros ovalifolia

Euodia lunu-ankenda

Ficus microcarpa

Ficus tsjahela

Litsea floribunda

Mallotus philippensis

Mangifera indica

Memecylon lushingtonii

Neolitsea zeylanica

Nothopodia beddomei

Olea glandulifera

Persea macrantha

Phoebe paniculata

Syzygium cumini

Vernonia monosis

- Trees and shrubs under the canopy:

Alphonsea sclerocarpa

Antidesma menasu

Atalantia wightii

Cipadessa baccifera

Clausena indica

Cocculus laurifolius

Euonymus crenulatus

Maesa indica

Miliusa eriocarpa

Notapodytes foetida

Pavetta indica

Psychotria nigra

Scolopia crenata

- Under shrubs:

Elatostema lineolatum

Nilgirianthus heyneanus

Ophiopogon intermedius

- Climbers:

Allophylus cobbe

Asparagus racemosus

Clematis gouriana

Entada pursaetha

Hiptage benghalensis

Jasminum azoricum

Piper hymenophyllum

Sageretia filiformis

Smilax perfoliata

Toddalia asiatica* var. *floribunda

Uvaria narum

Ventilago maderaspatana

Towards the upper limit of this type are found species which are more characteristic of higher elevations.

Casearia ovata

Cinnamomum travancoricum

Fagraea ceilanica

Ixora notoniana

Meliosma pinnata ssp. *arnottiana*

Schefflera capitata

Xantolis tomentosa

A few more heliophilous species are found specially near the edges or in openings:

Callicarpa tomentosa

Celtis tetrandra

Chionanthus ramiflora

Glochidion neilgherrense

Macaranga peltata

Mallotus tetracoccus

Meyna laxiflora

Murraya paniculata

Sapindus laurifolius

Sterculia guttata

Trichilia connaroides

4. Semi-evergreen forests

This type is recognised on the basis of the absence of any typical or characteristic species of the other types at this elevation (*Diospyros ovalifolia*, *Memecylon lushingtonii*, *Olea glandulifera*, *Mesua ferrea*, etc.). It occurs in small pockets which, in Biligir Rangan Hills, are confined to altitudes between 1100 and 1400 m and are mostly transitional to the evergreen types. Several deciduous species of the neighbouring forests are found growing along with the evergreen species.

Antidesma menasu

Aphanamixis polystachya

Ardisia solanacea

Atalantia wightii

Bischofia javanica

Callicarpa tomentosa

Canthium dicoccum

Cassia fistula

Celtis tetrandra

Chionanthus ramiflorus

Chasalia ophioxylodes

Cinnamomum malabathrum

Colebrookia oppositifolia

Dalbergia latifolia

Dalbergia paniculata

Dimocarpus longan

Diospyros montana

Elaeocarpus serratus

Emblia officinalis

Eriolæna hookeriana

Euodia lunu-ankenda

Glochidion velutinum

Grewia tiliifolia*Kydia calycina**Litsea deccanensis****Litsea floribunda****Maesa indica****Mallotus philippensis******Neolitsea zeylanica****Nothapodytes foetida**Nothopodia beddomei**Persea macrantha**Phoebe paniculata**Piper hymenophyllum**Pterocarpus marsupium****Scolopia crenata******Sterculia guttata****Syzygium cumini**Terminalia alata****Terminalia paniculata****Toona ciliata**Uvaria narum**Wendlandia thyrsoidea*

Some patches of such semi-evergreen forests on the southeastern slope of BRH constitute a transition to the higher elevation type. The deciduous species are more or less the same as above. The formation becomes richer in Lauraceae and other evergreen species, particularly:

Meliosma simplicifolia ssp. *pungens**Vernonia monosis**Viburnum punctatum**Xantolis tomentosa***C. High elevation (altitude 1300-1800 m)**

With the exception of the highest peaks of the BRH (1816 m) and Shevaroy (1649 m), the elevation is less than 1600 m. High elevation forests encountered thus belong to a transition stage, between 1350-1700 m, and are rich in Lauraceae and Myrtaceae. The three types distinguished at these elevations share a major part of their floristic composition. They differ in the absence of some species as one moves from west to east, and the appearance or concomitant domination of some others which are more typical of the eastern influence.

These forests are generally confined to the very sheltered areas, often in valleys where the atmospheric humidity and soil moisture are more favourable for their growth. All around and on the peaks, the natural vegetation is constituted by tree savannas, shrub savannas or grasslands.

Temperature plays a predominant role at this elevation. Rainfall is generally between 1500 and 1800 mm and the dry season is reduced to 3 or 4 months (Attikan Estate, Yercaud)

These forests, locally called sholas, are low formations rarely exceeding a height of 15m, with low branching, stunted trees, often loaded with mosses, lichens and other epiphytes. Stratification is not evident. Many of these forests have become highly degraded, mostly as a result of fires lit annually in the neighbouring savannas.

1. *Schefflera* spp. - *Gordonia obtusa* - *Meliosma* spp. type

This type occupies only a very small area on the map, on the upper slopes of the Nilgiris. It extends towards the west (see Mercara-My sore sheet) and naturally to the southwest all along the Western Ghats. The floristic list is given in the Annexe. Only the main species are cited here, emphasizing the richness in Lauraceae and Myrtaceae members. *Schefflera* is represented by 5 species.

*Alseodaphne malabarica**Apollonias arnottii****Cinnamomum verum****Cinnamomum sulphuratum**Cryptocarya neilgherrensis**Elaeocarpus serratus**Euonymus crenulatus**Gomphandra coriacea****Gordonia obtusa****Litsea floribunda**Litsea oleoides****Litsea stocksii****Meliosma pinnata* ssp. *arnottiana****Meliosma simplicifolia* ssp. *pungens******Neolitsea zeylanica****Persea macrantha****Phæbe wightii****Rhodomyrtus tomentosa**Schefflera capitata****Schefflera micrantha****Schefflera racemosa**Syzygium arnottianum****Syzygium caryophyllatum******Syzygium hemisphericum****Turpinia cochinchinensis**Viburnum punctatum***2. *Schefflera capitata* - *Neolitsea zeylanica* - *Meliosma* spp. type**

This type is found in BRH, still covering vast areas. It is the best represented type at these elevations on the sheet and has been studied in detail (Ramesh 1989).

The complete floristic list, which includes about a hundred species, is given in the Annexe. Only the most common species are mentioned below:

Actinodaphne lawsonii

Bischofia javanica
Casearia ovata
Cinnamomum malabathrum
Cinnamomum sulphuratum
Cryptocarya neilgherrensis
Daphniphyllum neilgherrense
Eurya japonica
Glochidion neilgherrense
Ligustrum gamblei
Litsea floribunda
Maesa indica
Meliosma simplicifolia* ssp. *pungens
Neolitsea zeylanica
Olea glandulifera
Persea macrantha
Phoebe paniculata
Psychotria elongata
Rapanea wightiana
Schefflera capitata
Symplocos cochinchinensis* ssp. *laurifolia
Symplocos foliosa
Syzygium cumini
Vernonia monosis
Viburnum punctatum
Xantolis tomentosa

3. *Vaccinium neilgherrense* - *Neolitsea zeylanica* - *Meliosma* spp. type

This type is found only in a few forest patches on the summit of the Shevaroy. The forests are generally quite disturbed by man who settled in this hill a longtime ago. A major part of the area of this type has been converted into coffee estates.

Trees

Antidesma menasu
Apodytes beddomei
Canthium dicoccum* var. *umbellatum
Chionanthus ramiflora
Cyathea gigantea
Elaeocarpus serratus
Garuga pinnata
Ilex denticulata
Ligustrum perrottetii
Macaranga peltata
Meliosma pinnata ssp. *arnottiana*
Meliosma simplicifolia* ssp. *pungens
Neolitsea zeylanica
Persea macrantha
Rapanea capitellata
Symplocos cochinchinensis
Syzygium cumini

Vernonia monosis
Vaccinium neilgherrense

Shrubs

Maesa indica
Nilgirianthus heyneanus
Psychotria elongata

Climbers

Celastrus paniculatus
Elaeagnus kologa
Gnetum ula
Hiptage benghalensis
Smilax zeylanica
Toddalia asiatica* var. *floribunda

4. Tree savanna, shrub savanna and grassland

The successional status of these savannas is still not well established. Some may be *climax* whereas others are seral in nature. Therefore they have been treated together here.

A continuous grass carpet covers the spaces separating the 'sholas'. Most often some scattered shrubs and bushes are found, giving the formation an aspect of a shrub savanna or tree savanna, like on the slopes of the Nilgiris where the shrubs are a little bigger.

Among the shrubs may be cited:

Chionanthus ramiflora
Emblica officinalis
Glochidion neilgherrense
Glochidion velutinum
Wendlandia thyrsoides
Phoenix humilis (sometimes dominant)

The most common herbaceous species are:

Artemisia parviflora
Coleus sp.
Conyza stricta
Curcuma neilgherrense
Cyanotis fasciculata
Exacum bicolor
Habenaria sp.
Hypericum mysorensis
Lagera alata
Oldenlandia sp.
Phlebophyllum kunthianum

The most common grasses are:

Cymbopogon flexuosus
Cymbopogon nardus
Themeda cymbaria
Themeda triandra

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ANNEXES: FLORISTIC LISTS OF THE FOREST TYPES

LEGEND

Indication of structural level and life form

E, I, II, III, IV,	: emergent, structural ensembles I, II, III, IV
T	: big tree
t	: small tree
S	: shrub or under-shrub
H	: herb
L	: liana, climber
Ep	: epiphyte
St	: strangler
P	: parasite

Indication of frequency

VC	: very common
C	: common
O	: occasional
R	: rare

Indication of ecological preference and geographical distribution

R	: riparian, humid localities
Op	: openings
M	: margin of the forest
A	: savanna-woodland to tree savanna
B	: scrub-woodland
*	: in the transition zone with the high elevation forest
K	: Kerala
N.K.	: North Kanara
W.G.	: endemic of Western Ghats

Indication of pheneology

D	: deciduous species
EV	: evergreen species

ALBIZIA AMARA - ACACIA SPP. TYPE
(Scrub-woodland)

DICOTYLEDONS			EUPHORBIACEAE		
APOCYNACEAE			Cleistanthus collinus (Roxb.) Benth.	t	C
Carissa carandas L.	S	r	Euphorbia antiquorum L.	t	C
Carissa opaca L.	S	C	Euphorbia nivulia Buch.-Ham.	t	r
Carissa spinarum L.	S	O	Givotia rottleriformis Griff.	T	O
Wrightia tinctoria (Roxb.) R. Br.	T	VC	Jatropha glandulifera Roxb.	S	O
			Securinega leucopyrus (Willd.) M. Arg.	S	VC
ASCLEPIADACEAE			FABACEAE (Caesalpinioideae)		
Hemidesmus indicus (L.) R. Br.	L	r	Bauhinia racemosa Lam.	T	O
Sarcostemma acidum (Roxb.) Voigt	L	O	Hardwickia binata Roxb.	T	C
Wattakaka volubilis (L.f.) Stapf	L	r	Pterolobium hexapetalum (Roth)	L	VC
			Sant. & Wagh		
ASTERACEAE			FABACEAE (Faboideae)		
Notonia grandiflora Wall. ex DC.	S	r	Dalbergia latifolia Roxb.	T	C
BORAGINACEAE			Dalbergia paniculata Roxb.	T	O
Cordia monoica Roxb.	S	r			
BURSERACEAE			FABACEAE (Mimosoideae)		
Commiphora berryi (Arn.) Engl.	S	r	Acacia chundra (Roxb.) Willd.	T	VC
			Acacia ferruginea DC	t	r
CACTACEAE			Acacia latronum Willd.	t	r
Opuntia dillenii (Ker Gawl.) Haw.	S	O	Acacia leucophloea (Roxb.) Willd.	T	O
			Albizia amara (Roxb.) Boiv.	T	C
CAPPARIDACEAE			Albizia odoratissima (L. f.) Benth.	T	r
Capparis divaricata Lam.	L	r	Dichrostachys cinerea Wight & Arn.	t	VC
Capparis sepiaria L.	L	O			
CELASTRACEAE			FLACOURTIACEAE		
Cassine glauca (Rottb.) Kuntze	T	r	Flacourtia indica (Burm f.) Merr.	S	O
Maytenus emarginata (Willd.)	S	O			
Ding Hou	S	r	HERNANDIACEAE		
Maytenus ovata (Wight & Arn.) Loes.	S	r	Gyrocarpus jacquini Roxb.	T	O
COMBRETACEAE					
Anogeissus latifolia (Roxb.) Wall.	T	C	LINACEAE		
Combretum ovalifolium Roxb.	L	r	Hugonia mystax L	S	O
EBENACEAE					
Diospyros ferrea (Willd) Bakh.	T	O	LOGANIACEAE		
Diospyros melanoxylon Roxb.	T	O	Strychnos potatorum L. f.	T	O
Diospyros montana Roxb.	T	O	LORANTHACEAE		
			Dendrophthoe falcata (L.f.) Ettingsh.	P	O
ERYTHROXYLACEAE			MALVACEAE		
Erythroxylum monogynum Roxb.	t	VC	Kydia calycina Roxb.	t	r
			MELIACEAE		
			Azadirachta indica A. Juss.	T	O

MORACEAEFicus benghalensis *L.*

T O

OLEACEAEJasminum auriculatum *Vahl*

L O

RHAMNACEAEScutia myrtina (*Burm.f.*) *Kurz*

L r

Ziziphus mauritiana *Lam.*

t O

Ziziphus oenoplia *Mill.*

L C

Ziziphus xylopyrus (*Retz.*) *Willd.*

T C

RUBIACEAEBenkara malabarica (*Lam.*) *Tirven.*

S C

Canthium dicoccum (*Gaertn.*) *T. & B.*

T O

Catunaregam dumetorum *Tirven.*

S C

Hymenodictyon excelsum *Wall.*

T r

Ixora arborea *Roxb.*

t O

Tarenna asiatica (*L.*) *Kuntze*

S C

RUTACEAEAtalantia monophylla *Corr.*

T C

Atalantia racemosa *Wight & Arn.*

T r

Chloroxylon swietenia *DC.*

T O

Clausena dentata (*Willd.*) *Roem.*

t O

Toddalia asiatica (*L.*) *Lam.*

L c

SAPINDACEAECardiospermum halicacabum *L.*

L O

Sapindus emarginatus *Vahl*

T O

SAPOTACEAEManilkara hexandra (*Roxb.*) *Dubard*

T r

SOLANACEAESolanum pubescens *Willd.*

S O

STERCULIACEAESterculia urens *Roxb.*

T O

TILIACEAEGrewia tenax (*Forssk.*) *Fiori*

S O

Grewia tiliifolia *Vahl*

T O

VERBENACEAEGmelina asiatica *L.*

S r

Lantana camara *L.*

S C

Premna latifolia *Roxb.*

T O

Premna tomentosa *Willd.*

T r

Vitex altissima *L.f.*

T r

VITACEAECissus quadrangularis *L.*

L O

MONOCOTYLEDONS**ARECACEAE**Phoenix humilis *Royle*

t O

DIOSCOREACEAEDioscorea oppositifolia *L.*

L O

LILIACEAEGloriosa superba *L.*

L O

POACEAEDendrocalamus strictus (*Roxb.*) *Nees*

T O

GYROCARPUS JACQUINI AND / OR HARDWICKIA BINATA TYPES
(On slopes, skeletal soils and as transition facies)

DICOTYLEDONS				Radermachera xylocarpa (Roxb.) Schum.	T	O	A,B
				Stereospermum personatum (Hassk.) Chatterjee	T	O	B
ACANTHACEAE							
Rhinacanthus nasutus (L.) Kurz	S	O	B	BIXACEAE			
				Cochlospermum religiosum (L.) Alston	T	O	A,B
ALANGIACEAE							
Alangium salvifolium (L.f.) Wang.	t	r	A,B	BOMBACACEAE			
				Bombax ceiba L.	T	O	B
ANACARDIACEAE							
Buchanania axillaris (Desr.) Ramam.	T	r	A,B	BORAGINACEAE			
Buchanania lanzan Spreng.	T	C	B	Cordia gharaf (Forssk.) Ehrenb.	T	O	B
Lannea coromandelica (Houtt.) Merr.	T	C	A,B	Cordia macleodii (Griff.) Hk. f. & T.	T	O	B
Rhus mysorensis Heyne	S	O	A,B	Cordia monoica Roxb.	S	C	A,B
Semecarpus anacardium L. f.	T	r	B				
Spondias pinnata (L. f.) Kurz	T	r	B	BURSERACEAE			
				Boswellia serrata Roxb. ex Colebr.	T	C	A,B
ANNONACEAE				Commiphora berryi (Arn.) Engl.	S	C	A,B
Polyalthia cerasoides (Roxb.) Bedd.	T	r	A,B	Commiphora caudata Engl.	T	C	A,B
				Garuga pinnata Roxb.	T	O	A,B
APOCYNACEAE							
Carissa carandas L.	S	r	A,B	CACTACEAE			
Carissa opaca L.	S	C	B	Opuntia dillenii (Ker Gawl.) Haw.	S	O	A,B
Holarrhena antidysenterica (Roxb.) Wall.	S	r	B				
Wrightia tinctoria (Roxb.) R. Br.	T	C	A,B	CAPPARIDACEAE			
Wrightia tomentosa R. & S.	T	r	B	Cadaba fruticosa (L.) Druce	S	O	A,B
				Capparis divaricata Lam.	t	O	B
ARALIACEAE				Capparis sepiaria L.	L	C	A,B
Schefflera stellata (Gaertn.) Harms.	t	O	B				
				CELASTRACEAE			
ARISTOLOCHIACEAE				Cassine glauca (Rottb.) Kuntze	T	r	A,B
Aristolochia indica L.	L	O	A,B	Celastrus paniculatus Willd.	L	O	B
				Maytenus emarginata (Willd.) Ding Hou	S	C	A,B
ASCLEPIADACEAE				Maytenus ovata (Wight & Arn.) Loes.	S	r	A,B
Calotropis gigantea (L.) R. Br.	S	O	B	Maytenus wallichiana (Wight & Arn.) Raju & Babu	S	r	B
Hemidesmus indicus R. Br.	L	O	A,B	Pleurostyliia opposita (Wall.) Alston	T	r	A,B
Sarcostemma acidum (Roxb.) Voigt	L	O	A,B				
Secamone emetica (Retz.) R. Br.	L	O	A,B	COMBRETACEAE			
Wattakaka volubilis (L.f.) Stapf	L	r	A	Anogeissus lalifolia (Roxb.) Wall.	T	C	A,B
				Combretum ovalifolium Roxb.	L	r	B
ASTERACEAE				Terminalia alata Heyne ex Roth	T	C	B
Chromolaena odorata (L.) King & Robin.	S	C	B	Terminalia arjuna Wight & Arn.	T	r	B
Notonia grandiflora Wall. ex DC.	S	O	A,B	Terminalia bellirica (Gaertn.) Roxb.	T	O	B
				Terminalia chebula Retz.	T	O	A,B
BIGNONIACEAE				Terminalia paniculata Roth	T	O	A,B
Dolichandrone atrovirens Sprague	T	C	A,B				
Dolichandrone falcata Seem.	T	O	A				

CONVOLVULACEAE

Argyrea cuneata (Willd.) Ker Gawl.
Rivea hypocrateriformis (Desr.) Choisy

EBENACEAE

Diospyros ebenum Koenig
Diospyros exsculpta Bedd.
Diospyros ferrea (Willd.) Bakh.
Diospyros melanoxylon Roxb.
Diospyros montana Roxb.

EHRETIACEAE

Carmona retusa (Vahl) Masam.
Ehretia ovalifolia Wight
Ehretia pubescens Benth.

ERYTHROXYLACEAE

Erythroxylum monogynum Roxb.

EUPHORBIACEAE

Breynia rhamnoides (Retz.) M. Arg.
Bridelia crenulata Roxb.
Cleistanthus collinus (Roxb.) Benth.
Drypetes sepiaria (W. & A.) Pax & Hoffm.
Emblia officinalis Gaertn.
Euphorbia antiquorum L.
Euphorbia nivulia Buch.-Ham.
Givotia rotleriformis Griff.
Jatropha glandulifera Roxb.
Jatropha gossypifolia L.
Mallotus philippensis (Lam.) M. Arg.
Securinega leucopyrus (Willd.) M. Arg.

FABACEAE (Caesalpinioideae)

Bauhinia racemosa Lam.
Cassia auriculata L.
Cassia fistula L.
Hardwickia binata Roxb.
Pterolobium hexapetalum (Roth)
Sant. & Wagh
Tamarindus indica L.

FABACEAE (Faboideae)

Abrus precatorius L.
Butea monosperma (Lam.) Taub.
Butea parviflora Roxb.
Dalbergia latifolia Roxb.
Dalbergia paniculata Roxb.
Derris scandens (Roxb.) Benth.
Erythrina suberosa Roxb.
Indigofera cassioides Rottl. ex DC.
Mundulea sericea (Willd.) A. Cheval.
Pongamia pinnata (L.) Pierre
Pterocarpus marsupium Roxb.

FABACEAE (Mimosoideae)

Acacia caesia (L.) Willd.
Acacia chundra (Roxb. ex Rottl.) Willd.
Acacia ferruginea DC.
Acacia latronum Willd.
Acacia leucophloea (Roxb.) Willd.
Acacia pennata (L.) Willd.
Acacia torta (Roxb.) Craib.
Albizia amara (Roxb.) Boiv.
Albizia lebbeck (L.) Benth.
Albizia marginata (Lam.) Merr.
Albizia odoratissima (L.f.) Benth.
Albizia procera Benth.
Dichrostachys cinerea Wight & Arn.
Mimosa rubicaulis Lam.

FLACOURTIACEAE

Flacourtia indica (Burm.f.) Merr.

HERNANDIACEAE

Gyrocarpus jacquini Roxb.

LAURACEAE

Litsea deccanensis Gamble

LINACEAE

Hugonia mystax L.

LOGANIACEAE

Strychnos nux-vomica L.
Strychnos potatorum L.f.

LORANTHACEAE

Dendrophthoe falcata (L.f.) Ettingsh.

LYTHRACEAE

Lagerstroemia parviflora Roxb.

MALPIGHIACEAE

Hiptage benghalensis (L.) Kurz

MALVACEAE

Kydia calycina Roxb.

MELASTOMATAACEAE

Memecylon lushingtonii Gamble
Memecylon umbellatum Burm. f.

MELIACEAE

Azadirachta indica A. Juss.
Chukrasia tabularis A. Juss.
Cipadessa baccifera Miq.
Soymida febrifuga A. Juss.
Toona ciliata Roemer

MENISPERMACEAE

Pachygone ovata (Poir.) Hk. f. & T.

L r B

MORACEAE

Ficus amplissima Smith

T r B

Ficus arnottiana Miq.

T O B

Ficus benghalensis L.

T O A,B

Ficus microcarpa L. f.

T O A,B

Ficus mollis Vahl

T C A,B

Ficus tsjahela Burm. f.

T O B

Ficus virens Aiton

T O A

MORINGACEAE

Moringa concanensis Nimmo

T O B

MYRTACEAE

Syzygium cumini (L.) Skeels

T O B

OCHNACEAE

Ochna squarrosa L.

t r B

OLEACEAE

Chionanthus ramiflora Roxb.

T O B

Jasminum auriculatum Vahl

L O B

Jasminum cuspidatum Rottl.

S C B

Olea glandulifera Wall. ex G. Don

T O B

Schrebera swietenoides Roxb.

T O A,B

OPILIACEAE

Cansjera rheedii Gmel.

L O A,B

RANUNCULACEAE

Clematis gouriana Roxb. ex DC.

L O B

RHAMNACEAE

Scutia myrtina (Burm. f.) Kurz

L O A,B

Ventilago maderaspatana Gaertn.

L O B

Ziziphus horrida Roth

t O B

Ziziphus mauritiana Lam.

T O A,B

Ziziphus oenoplia Mill.

L C A,B

Ziziphus rugosa Lam.

L O B

Ziziphus xylopyrus (Retz.) Willd.

T O A,B

RUBIACEAE

Benkara malabarica (Lam.) Tirven.

S R A,B

Canthium dicoccum (Gaertn.) Merr.

T C A,B

Canthium parviflorum Lam.

S O A,B

Catunaregam dumetorum Tirven.

S C A,B

Catunaregam torulosa (Dennst.) Tirven.

t O B

Ceriscoides turgida (Roxb.) Tirven.

t r A,B

Deccania pubescens (Roth) Tirven.

T r A

Gardenia gummifera L. f.

T r B

Gardenia latifolia Ait.

T O A,B

Gardenia resinifera Roth

T C A,B

Haldina cordifolia (Roxb.) Ridsdale

T r A,B

Hymenodictyon excelsum (Roxb.) Wall.

T r A,B

Ixora arborea Roxb. ex Smith

t O A,B

Mitragyna parvifolia (Roxb.) Korth.

T O A,B

Morinda coreia Buch.-Ham.

T C A,B

Paveta indica L.

S O B

Tarenna asiatica (L.) Kuntze

S C A,B

RUTACEAE

Atalantia monophylla (L.) Correa

T C A,B

Chloroxylon swietenia DC.

T C A,B

Citrus medica L.

t O B

Clausena dentata (Willd.) Roem.

t C B

Limonia acidissima L.

t O A,B

Murraya paniculata (L.) Jack

S O B

Naringi crenulata (Roxb.) Nicolson

T O A,B

Pleiospermum alatum (Wall.) Swingle

t C A,B

Toddalia asiatica (L.) Lam.

L C A,B

SANTALACEAE

Osyris quadripartita Salzm. ex Decne.

S O A,B

Santalum album L.

T O A,B

SAPINDACEAE

Allophylus cobbe (L.) Raeusch.

t C B

Cardiospermum halicacabum L.

L C A,B

Dodonaea viscosa (L.) Jacq.

S C A,B

Lepisanthes tetraphylla (Vahl) Radlk.

t O B

Sapindus emarginatus Vahl

T O A,B

Schleichera oleosa (Lour.) Oken

T O A,B

SAPOTACEAE

Madhuca longifolia (Koen.) Macbr.

T O B

Manilkara hexandra (Roxb.) Dubard

T r B

Manilkara roxburghiana (Wight) Dub.

T r B

SIMAROUBACEAE

Ailanthus excelsa Roxb.

T O B

SOLANACEAE

Solarium pubescens Willd.

S C A,B

STERCULIACEAE

Eriolaena hookeriana Wight & Arn.

t O B

Helicteres isora L.

S O B

Pterospermum suberifolium (L.) Lam.

T r B

Sterculia colorata Roxb.

T r B

Sterculia urens Roxb.

T C A,B

Sterculia villosa Roxb. ex DC.

T O B

TILIACEAE

Grewia flavescens Juss.

L O B

Grewia orbiculata Rottl.

t O A,B

Grewia rhamnifolia Heyne ex Roth

L C A,B

Grewia tenax (<i>Forssk.</i>) Fiori	S	O	A,B
Grewia tiliifolia Vahl	T	C	A,B
Grewia villosa Willd.	S	C	A,B
ULMACEAE			
Celtis tetrandra Roxb.	T	O	B
Holoptelea integrifolia Pl.	T	O	A,B
Trema orientalis Bl.	T	r	B
VERBENACEAE			
Clerodendrum serratum (<i>L.</i>) Moon	S	O	B
Gmelina arborea Roxb.	T	O	B
Gmelina asiatica L.	S	O	A,B
Lantana camara L.	S	C	A,B
Premna latifolia Roxb.	T	O	B
Premna tomentosa Willd.	T	O	A,B
Tectona grandis L. f.	T	O	A,B
Vitex altissima L. f.	T	O	A,B
VITACEAE			
Ampelocissus tomentosa (<i>Roth</i>) Pl.	L	O	A
Cissus pallida Pl.	L	O	A,B
Cissus quadrangularis L.	L	C	A,B

MONOCOTYLEDONS

ARECACEAE

Phoenix humilis Royle

DIOSCOREACEAE

Dioscorea oppositifolia L.

Dioscorea pentaphylla L.

LILIACEAE

Asparagus racemosus Willd.

Gloriosa superba L.

POACEAE

Dendrocalamus strictus Nees

t	C	B
L	O	A,B
L	C	A
L	C	A,B
L	O	A,B
T	O	A,B

**ANOGEISSUS LATIFOLIA - CHLOROXYLON SWIETENIA -
ALBIZIA AMARA TYPE**

DICOTYLEDONS				BORAGINACEAE			
ALANGIACEAE				Cordia macledonii (Griff.) Hk. f. & T.	T	O	B
Alangium salvifolium (L. f.) Wang.	t	r	B	Cordia monoica Roxb.	S	r	A
ANACARDIACEAE				BURSERACEAE			
Buchanania axillaris (Desr.) Ramam.	T	C	A,B	Boswellia serrata Roxb.	T	O	B
Buchanania lanzan Spreng.	T	O	B	Commiphora caudata Engl.	T	C	A,B
Lannea coromandelica (Houtt.) Merr.	T	C	B	Garuga pinnata Roxb.	T	O	B
Mangifera indica L.	T	r	B	CACTACEAE			
Rhus mysorensis G. Don	S	r	A	Opuntia dillenii (Ker Gawl.) Haw.	S	C	A
Spondias pinnata (L. f.) Kurz	T	r	B	CAPPARIDACEAE			
ANNONACEAE				Cadaba fruticosa (L.) Druce	S	O	A
Miliusa eriocarpa Dunn	t	r	B	Capparis sepia L.	L	C	A,B
Polyalthia cerasoides (Roxb.) Bedd.	T	O	A,B	CELASTRACEAE			
APOCYNACEAE				Cassine glauca (Rottb.) Kuntze	T	r	A,B
Carissa carandas L.	S	O	A	Maytenus emarginata (Willd.) Ding Hou	S	C	A
Carissa opaca L.	S	O	A,B	Maytenus ovata (Wight & Arn.) Loes.	S	O	A,B
Carissa spinarum L.	S	C	A	Pleurostyliopsis opposita (Wall.) Alston	T	O	A
Wrightia tinctoria (Roxb.) R. Br.	T	C	A,B	COMBRETACEAE			
ARALIACEAE				Anogeissus latifolia (Roxb.) Wall.	T	VC	A,B
Schefflera stellata (Gaertn.) Harms	St	O	B	Combretum ovalifolium Roxb.	L	r	A
ASCLEPIADACEAE				Terminalia alata Heyne ex Roth	T	O	B
Hemidesmus indicus R. Br.	T	O	A	Terminalia bellirica (Gaertn.) Roxb.	T	O	B
Sarcostemma acidum (Roxb.) Voigt	L	O	A,B	Terminalia chebula Retz.	T	O	B
Secamone emetica (Retz.) R. Br.	L	O	A,B	CONVOLVULACEAE			
ASTERACEAE				Argyrea cuneata (Willd.) Ker Gawl.	S	C	B
Chromolaena odorata (L.) King & Robin.	S	C	B	Rivea hypocrateriformis Choisy	L	r	A
Notonia grandiflora Wall. ex DC.	S	O	A,B	EBENACEAE			
BIGNONIACEAE				Diospyros chloroxylon Roxb.	T	r	A
Dolichandrone atrovirens Sprague	T	O	A	Diospyros ebenum Koenig	T	r	A,B
Dolichandrone falcata Seem.	T	C	A	Diospyros exsculpta Bedd.	T	O	A,B
Stereospermum personatum (Hassk.) Chatterjee	T	O	A,B	Diospyros ferrea (Willd.) Bakh.	T	C	A,B
BIXACEAE				Diospyros melanoxylon Roxb.	T	O	A,B
Cochlospermum religiosum (L.) Alston	T	O	B	Diospyros montana Roxb.	T	r	A,B
BOMBACACEAE				Diospyros ovalifolia Wight	T	O	B
Bombax ceiba L.	T	O	A	EHRETIACEAE			
				Carmona retusa (Vahl) Masam.	S	O	A,B
				Ehretia pubescens Benth.	S	C	A,B

ERYTHROXYLACEAE

Erythroxylum monogynum Roxb.	t	C	A,B
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EUPHORBIACEAE

Breynia rhamnoides (Retz.) M. Arg.	S	C	B
Bridelia crenulata Roxb.	T	O	B
Cleistanthus collinus (Roxb.) Benth.	t	O	B
Drypetes sepiaria (Wight & Arn.) Pax & Hoffm.	t	r	B
Embllica officinalis Gaertn.	T	C	A,B
Euphorbia antiquorum L.	t	C	B
Euphorbia nivulia Buch.-Ham.	t	r	B
Euphorbia tirucalli L.	t	O	A
Givotia rottleriformis (Griff.) Pax & Hoffm.	T	O	A,B
Securinega leucopyrus (Willd.) M. Arg.	S	C	A,B
Suregada angustifolia Muell. Arg. Airy Shaw	T	O	B

FABACEAE (Caesalpinioideae)

Bauhinia racemosa Lam.	T	O	A,B
Cassia fistula L.	T	O	A,B
Hardwickia binata Roxb.	T	O	A,B
Pterolobium hexapetalum (Roth) Sant. & Wagh	L	C	A,B
Tamarindus indica L.	T	r	A,B

FABACEAE (Faboideae)

Abrus precatorius L.	L	O	A,B
Butea monosperma (Lam.) Taub.	T	O	A
Butea parviflora Roxb.	L	r	A
Dalbergia latifolia Roxb.	T	O	A,B
Dalbergia paniculate Roxb.	T	C	A,B
Erythrina suberosa Roxb.	T	r	A
Mundulea sericea (Willd.) A. Cheval.	t	r	A
Pongamia pinnata (L.) Pierre	T	r	B
Pterocarpus marsupium Roxb.	T	O	A,B

FABACEAE (Mimosoideae)

Acacia chundra (Roxb. ex Rottl.) Willd.	T	C	A
Acacia ferruginea DC.	T	O	A
Acacia latronum Willd.	t	r	B
Acacia leucophloea (Roxb.) Willd.	t	O	B
Acacia pennata (L.) Willd.	L	C	A,B
Albizia amara (Roxb.) Boiv.	T	VC	A,B
Albizia lebbeck (L.) Willd.	T	O	A
Albizia marginata (Lam.) Merr.	T	r	A
Albizia odoratissima (L.f.) Benth.	T	r	B
Albizia procera (Roxb.) Benth.	T	r	B
Dichrostachys cinerea Wight & Arn.	t	C	A,B

FLACOURTIACEAE

Flacourtia indica (Burm.f.) Merr.	S	C	A,B
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HERNANDIACEAE

Gyrocarpus jacquini Roxb.	T	C	A,B
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LAURACEAE

Litsea deccanensis Gamble	T	r	B
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LOGANIACEAE

Strychnos potatorum L. f.	T	O	A,B
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MALPIGHIACEAE

Hiptage benghalensis (L.) Kurz	L	O	B
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MALVACEAE

Kydia calycina Roxb.	t	r	B
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MELASTOMATACEAE

Memecylon lushingtonii Gamble	t	r	A
Memecylon umbellatum Burm.f.	t	r	A,B

MELIACEAE

Azadirachta indica A. Juss.	T	O	B
Chukrasia tabularis A. Juss.	T	r	B
Cipadessa baccifera Miq.	S	C	B

MENISPERMACEAE

Pachygone ovata (Poir.) Hk.f. & T.	L	O	A
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MORACEAE

Ficus benghalensis L.	T	O	B
Ficus microcarpa L. f.	T	O	B
Ficus mollis Vahl	T	C	A,B
Ficus virens Aiton	T	r	B
Streblus asper Lour.	t	O	B

MYRTACEAE

Syzygium cumini (L.) Skeels	T	O	B
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OLEACEAE

Chionanthus ramiflora Roxb.	T	r	B
Jasminum auriculatum Vahl	L	O	A,B
Jasminum cuspidatum Rottl.	S	C	A,B
Ligustrum gamblei Ramam.	T	O	B

OPILIACEAE

Cansjera rheedii Gmel.	L	O	A,B
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RHAMNACEAE

Sageretia parviflora (Klein) G. Don	L	r	A,B
Scutia myrtina (Burm.f.) Kurz	L	O	A,B
Ventilago maderaspatana Gaertn.	L	O	A
Ziziphus mauritiana Lam.	T	O	A
Ziziphus oenoplia Mill.	L	C	A,B
Ziziphus xylopyrus (Retz.) Willd.	T	C	A,B

RUBIACEAE

Benkara malabarica (Lam.) Tirven.	S	O	A,B
Canthium dicoccum (Gaertn.) Merr.	T	C	A,B

Canthium parviflorum <i>Lam.</i>	S	C	A,B
Catunaregam dumetorum <i>Tirven.</i>	S	C	A,B
Gardenia gummifera <i>L. f.</i>	T	r	B
Gardenia latifolia <i>Aiton</i>	T	O	A,B
Gardenia resinifera <i>Roth</i>	T	C	B
Haldina cordifolia (<i>Roxb.</i>) <i>Ridsdale</i>	T	r	A
Hymenodictyon excelsum (<i>Roxb.</i>) <i>Wall.</i>	T	r	A,B
Ixora arborea <i>Roxb.</i>	t	C	A,B
Mitragyna parvifolia (<i>Roxb.</i>) <i>Korth.</i>	T	r	A,B
Morinda coreia <i>Buch.-Ham.</i>	T	r	A
Tarenna asiatica (<i>L.</i>) <i>Kuntze</i>	S	C	A,B
RUTACEAE			
Aegle marmelos (<i>L.</i>) <i>Corr.</i>	t	O	B
Atalantia monophylla (<i>L.</i>) <i>Correa</i>	T	C	A,B
Atalantia racemosa <i>Wight & Arn.</i>	T	r	A,B
Chloroxylon swietenia <i>DC.</i>	T	C	A,B
Citrus medica <i>L.</i>	t	r	A
Clausena dentata (<i>Willd.</i>) <i>M.Roem.</i>	t	O	B
Limonia acidissima <i>L.</i>	T	O	A
Murraya paniculata (<i>L.</i>) <i>Jack.</i>	S	O	A,B
Naringi crenulata (<i>Roxb.</i>) <i>Nicolson</i>	T	r	A,B
Toddalia asiatica (<i>L.</i>) <i>Lam.</i>	L	C	A,B
SANTALACEAE			
Santalum album <i>L.</i>	T	O	A,B
SAPINDACEAE			
Cardiospermum halicacabum <i>L.</i>	L	O	A
Dodonaea viscosa (<i>L.</i>) <i>Jacq.</i>	S	C	A,B
Lepisanthes tetraphylla (<i>Vahl</i>) <i>Radlk.</i>	t	O	B
Sapindus emarginatus <i>Vahl</i>	T	O	A,B
Schleichera oleosa (<i>Lour</i>) <i>Oken</i>	T	O	A,B
SAPOTACEAE			
Madhuca longifolia (<i>Koen.</i>) <i>Macbr.</i>	T	O	B
Manilkara hexandra (<i>Roxb.</i>) <i>Dubard</i>	T	r	A
Mimusops elengi <i>L.</i>	T	r	A,B
SOLANACEAE			
Solanum pubescens <i>Willd.</i>	S	C	B

STERCULIACEAESterculia urens *Roxb.***TILIACEAE**Grewia orbiculata *Rottl.*Grewia rhamnifolia *Heyne ex Roth*Grewia tenax (*Forssk.*) *Fiori*Grewia tiliifolia *Vahl***ULMACEAE**Celtis tetrandra *Roxb.*Holoptelea integrifolia (*Roxb.*) *Pl.***VERBENACEAE**Gmelina arborea *Roxb.*Gmelina asiatica *L.*Lantana camara *L.*Premna tomentosa *Willd.*Tectona grandis *L. f.*Vitex altissima *L. f.***VITACEAE**Cissus pallida *Pl.*Cissus quadrangularis *L.***MONOCOTYLEDONS****DIOSCOREACEAE**Dioscorea oppositifolia *L.***LILIACEAE**Asparagus racemosus *Willd.***POACEAE**Dendrocalamus strictus *Nees***SMILACACEAE**Smilax perfoliata *Lour.*

T	C	A,B
t	r	B
L	C	A,B
S	O	A
T	C	B
T	O	B
T	O	A,B
T	r	B
S	O	B
S	C	A,B
T	O	A,B
T	O	A,B
T	O	A,B
L	O	A,B
L	C	A
L	C	A
L	C	A
T	O	A,B
L	O	B

**ANOGEISSUS LATIFOLIA - PTEROCARPUS MARSUPIUM -
TERMINALIA SPP. TYPE**

DICOTYLEDONS				BIGNONIACEAE			
ACANTHACEAE				Dolichandrone atrovirens <i>Sprague</i>	T	O	A
Thunbergia fragrans <i>Roxb.</i>	L	O	A	Dolichandrone falcata <i>Seem.</i>	T	O	B
ALANGIACEAE				Radermachera xylocarpa (<i>Roxb.</i>) <i>Schum.</i>	T	O	A
Alangium salvifolium (<i>L. f.</i>) <i>Wang.</i>	t	O	B	Stereospermum personatum (<i>Hassk.</i>) <i>Chatterjee</i>	T	C	A,B
ANACARDIACEAE				BOMBACACEAE			
Buchanania axillaris (<i>Desr.</i>) <i>Ramam.</i>	T	O	A	Bombax ceiba <i>L.</i>	T	O	A
Buchanania lanzan <i>Spreng.</i>	T	C	A,B	BORAGINACEAE			
Lannea coromandelica (<i>Houtt.</i>) <i>Merr.</i>	T	O	A	Cordia dichotoma <i>Forst.</i>	T	O	A
Mangifera indica <i>L.</i>	T	r	A	Cordia macleodii (<i>Griff.</i>) <i>Hk.f. & T.</i>	T	C	A,B
Nothopegia beddomei <i>Gamble</i>	t	r	A,B	BURSERACEAE			
Semecarpus anacardium <i>L. f.</i>	T	O	A,B	Boswellia serrata <i>Roxb. ex Colebr.</i>	T	O	A
ANNONACEAE				Commiphora caudata <i>Engl.</i>	T	O	A,B
Miliusa eriocarpa <i>Dunn.</i>	t	r	A	Garuga pinnata <i>Roxb.</i>	T	O	A,B
Polyalthia cerasoides (<i>Roxb.</i>) <i>Bedd</i>	T	O	A,B	CAPPARIDACEAE			
Uvaria narum <i>Wall.</i>	L	O	A,B	Capparis divaricata <i>Lam.</i>	t	O	A
APOCYNACEAE				Capparis sepiaria <i>L.</i>	L	O	A,B
Carissa carandas <i>L.</i>	S	O	B	CELASTRACEAE			
Holarhena antidysenterica (<i>Roxb.</i>) <i>Wall.</i>	S	C	B	Cassine glauca (<i>Rottb.</i>) <i>Kuntze</i>	T	O	A,B
Wrightia tinctoria (<i>Roxb.</i>) <i>R. Br.</i>	T	C	A,B	Celastrus paniculatus <i>Willd.</i>	L	O	A
Wrightia tomentosa <i>R. & S.</i>	T	r	A	Maytenus emarginata (<i>Willd.</i>) <i>Ding Hou</i>	S	O	A
ARALIACEAE				Maytenus ovata (<i>Wight & Arn.</i>) <i>Loes.</i>	S	r	A,B
Schefflera stellata (<i>Gaertn.</i>) <i>Harms.</i>	St	O	A,B	Pleurostyliya opposita (<i>Wall.</i>) <i>Alston</i>	T	r	A
ARISTOLOCHIACEAE				COMBRETACEAE			
Aristolochia indica <i>L.</i>	L	O	B	Anogeissus latifolia (<i>Roxb.</i>) <i>Wall.</i>	T	C	A,B
ASCLEPIADACEAE				Terminalia alata <i>Heyne ex Roth</i>	T	C	A
Hemidesmus indicus <i>R. Br.</i>	L	r	A,B	Terminalia bellirica (<i>Gaertn.</i>) <i>Roxb.</i>	T	C	A,B
Sarcostemma acidum (<i>Roxb.</i>) <i>Voigt</i>	L	O	A,B	Terminalia chebula <i>Retz.</i>	T	O	A,B
Secamone emetica (<i>Retz.</i>) <i>R. Br.</i>	L	O	A,B	Terminalia paniculata <i>Roth</i>	T	C	A,B
Wattakaka volubilis (<i>L.f.</i>) <i>Stapf</i>	L	r	A	CONVOLVULACEAE			
ASTERACEAE				Argyreia cuneata (<i>Willd.</i>) <i>Ker Gawl.</i>	S	C	A,B
Chromolaena odorata (<i>L.</i>) <i>King&Robin.</i>	S	C	A	Argyreia pilosa <i>Wight & Arn.</i>	L	r	B
Notonia grandiflora <i>Wall. ex DC.</i>	S	O	A	Rivea hypocrateriformis (<i>Desr.</i>) <i>Choisy</i>	L	r	B
Vernonia divergens <i>Edgew.</i>	S	O	B	EBENACEAE			
BARRINGTONIACEAE				Diospyros ebenum <i>Koenig</i>	T	r	A,B
Careya arborea <i>Roxb.</i>	T	C	A,B	Diospyros exsculpla <i>Bedd.</i>	T	O	A,B
				Diospyros ferrea (<i>Willd.</i>) <i>Bakh.</i>	T	O	A,B

Diospyros melanoxylon Roxb.
 Diospyros montana Roxb.
 Diospyros ovalifolia Wight

EHRETIACEAE

Carmona retusa (Vahl) Masam.

ERYTHROXYLACEAE

Erythroxylum monogynum Roxb.

EUPHORBIACEAE

Breynia rhamnoides (Retz.) M. Arg.
 Bridelia crenulata Roxb.
 Bridelia retusa Spreng.
 Emblica officinalis Gaertn.
 Givotia rottlerifolii Griff.
 Glochidion velutinum Wight
 Mallotus philippensis (Lam.) M. Arg.
 Securinega leucopyrus (Willd.) M. Arg.

FABACEAE (Caesalpinioideae)

Bauhinia purpurea L.
 Bauhinia racemosa Lam.
 Cassia fistula L.
 Hardwickia binata Roxb.
 Pterolobium hexapetalum (Roth)
 Sant. & Wagh

FABACEAE (Faboideae)

Butea monosperma (Lam.) Taub.
 Butea parviflora Roxb.
 Dalbergia latifolia Roxb.
 Dalbergia paniculate Roxb.
 Erythrina suberosa Roxb.
 Indigofera cassioides Rottl. ex DC.
 Pongamia pinnata (L.) Pierre
 Pterocarpus marsupium Roxb.

FABACEAE (Mimosoideae)

Acacia chundra (Roxb. ex Rottl.) Willd.
 Acacia leucophloea (Roxb.) Willd.
 Acacia pennata (L.) Willd.
 Acacia torta (Roxb.) Craib.
 Albizia amara (Roxb.) Boiv.
 Albizia lebbeck (L.) Benth.
 Albizia marginata (Lam.) Merr.
 Albizia odoratissima (L. f.) Benth.
 Dichrostachys cinerea Wight & Arn.
 Mimosa rubicaulis Lam.

FLACOURTIACEAE

Casearia elliptica Willd.
 Flacourtia indica (Burm. f.) Merr.

HERNANDIACEAE

Gyrocarpus jacquini Roxb.

LAURACEAE

Litsea deccanensis Gamble
 Litsea ligustrina Hk. f.
 Neolitsea zeylanica Merr.

LOGANIACEAE

Strychnos nux-vomica L.
 Strychnos potatorum L.f.

LORANTHACEAE

Dendrophthoe falcata (L.f.) Ettingsh.

LYTHRACEAE

Lagerstroemia parviflora Roxb.

MALPIGHIACEAE

Hiptage benghalensis (L.) Kurz

MALVACEAE

Kydia calycina Roxb.

MELASTOMATACEAE

Memecylon lushingtonii Gamble
 Memecylon umbellatum Burm. f.

MELIACEAE

Aglaia roxburghiana (W. & A.) Miq.
 Chukrasia tabularis A. Juss.
 Cipadessa baccifera Miq.
 Melia dubia Cav.
 Toona ciliata Roemer

MENISPERMACEAE

Pachygone ovata (Poir.) Hk. f. & T.

MORACEAE

Ficus amplissima Smith
 Ficus arnottiana Miq.
 Ficus benghalensis L.
 Ficus microcarpa L.f.
 Ficus mollis Vahl
 Ficus tsjahela Burm. f.
 Ficus virens Aiton
 Streblus asper Lour.

MYRSINACEAE

Ardisia solanacea Roxb.
 Embelia basaal A. DC.
 Embelia tsjeriam-cottam A. DC.

MYRTACEAE

Syzygium cumini (L.) Skeels

OCHNACEAE

Ochna squarrosa L.

T	O	A,B			
T	r	A,B			
T	r	A			
S	O	A,B			
t	C	A,B			
S	C	A,B			
T	C	A,B			
t	C	A,B			
T	C	A,B			
T	C	A			
t	O	A,B			
S	O	A,B			
T	O	A			
T	C	A,B			
T	C	A,B			
T	r	A			
L	O	A,B			
T	C	A,B			
L	O	B			
T	C	A,B			
T	C	A,B			
T	r	A			
S	O	A,B			
T	r	A			
T	C	A,B			
T	C	B			
T	O	A,B			
L	C	A,B			
L	r	A			
T	r	A,B			
T	O	A,B			
T	O	A			
T	r	A,B			
T	r	A			
t	O	B			
S	r	A,B			
L	r	A			
L	r	A,B			
T	O	A,B			
t	O	A,B			
S	O	A,B			
T	C	B			
T	r	A,B			
t	r	B			
t	r	B			
T	O	A			
T	C	A,B			
P	O	A			
T	O	A			
L	O	A,B			
t	C	A,B			
t	r	A			
t	r	A,B			
T	r	A,B			
T	O	A,B			
S	C	A,B			
T	r	A			
T	r	A,B			
L	r	A,B			
T	r	A			
T	O	A			
T	O	A			
T	O	A,B			
T	O	A			
T	r	A,B			
T	r	A			
t	O	B			
S	r	A,B			
L	r	A			
L	r	A,B			
T	O	A,B			
t	r	A			

OLEACEAE

Chionanthus malabarica *Bedd.*
 Chionanthus ramiflora *Roxb.*
 Jasminum auriculatum *Vahl*
 Jasminum cuspidatum *Rottl.*
 Ligustrum gamblei *Ramam.*
 Olea glandulifera *Wall. ex G. Don*
 Schrebera swietenoides *Roxb.*

OPILIACEAE

Cansjera rheedii *Gmel.*

RANUNCULACEAE

Clematis gouriana *Roxb. ex DC.*

RHAMNACEAE

Sageretia parviflora (*Schultes*) *Don*
 Scutia myrtina (*Burm.f.*) *Kurz*
 Ventilago maderaspatana *Gaertn.*
 Ziziphus oenoplia *Mill.*
 Ziziphus rugosa *Lam.*
 Ziziphus xylopyrus (*Retz.*) *Willd.*

ROSACEAE

Rubus niveus *Thunb.*

RUBIACEAE

Benkara malabarica (*Lam.*) *Tirven.*
 Canthium dicoccum (*Gaertn.*) *Merr.*
 Canthium parviflorum *Lam.*
 Catunaregam dumetorum *Tirven.*
 Catunaregam torulosa (*Dennst.*) *Tirven.*
 Gardenia latifolia *Ait.*
 Haldina cordifolia (*Roxb.*) *Ridsdale*
 Hymenodictyon excelsum (*Roxb.*) *Wall.*
 Ixora arborea *Roxb. ex Smith*
 Mitragnya parvifolia (*Roxb.*) *Korth.*
 Morinda coreia *Buch.-Ham.*
 Pavetta indica *L.*
 Pavetta tomentosa *L.*
 Tarenna asiatica (*L.*) *Kuntze*
 Wendlandia thyrsoides (*R. & S.*) *Steud.*

RUTACEAE

Atalantia monophylla (*L.*) *Correa*
 Atalantia racemosa *Wight & Arn.*
 Chloroxylon swietenia *DC.*
 Citrus medica *L.*
 Clausena dentata (*Willd.*) *Roem.*
 Clausena indica *Oliv.*
 Limonia acidissima *L.*
 Murraya paniculata (*L.*) *Jack*
 Naringi crenulata (*Roxb.*) *Nicolson*
 Toddalia asiatica (*L.*) *Lam.*

SANTALACEAE

Osyris quadripartita *Salzm. ex Decne*
 Santalum album *L.*

SAPINDACEAE

Allophylus cobbe (*L.*) *Raeusch.*
 Allophylus serratus (*Roxb.*) *Kurz*
 Dodonaea viscosa (*L.*) *Jacq.*
 Sapindus emarginatus *Vahl*
 Schleicheria oleosa (*Lour.*) *Oken*

SAPOTACEAE

Madhuca longifolia (*Koen.*) *Macbr.*
 Mimosa elengi *L.*
 Xantolis tomentosa (*Roxb.*) *Rafin.*

SIMAROUBACEAE

Ailanthus excelsa *Roxb.*

STERCULIACEAE

Eriolaena hookeriana *Wight & Arn.*
 Helicteres isora *L.*
 Pterospemum suberifolium (*L.*) *Lam.*
 Sterculia guttata *Roxb.*
 Sterculia urens *Roxb.*
 Sterculia villosa *Roxb. ex DC.*

TILIACEAE

Grewia rhamnifolia *Heyne ex Roth*
 Grewia tenax (*Forssk.*) *Fiori*
 Grewia tiliifolia *Vahl*
 Triumfetta pilosa *Roth*

ULMACEAE

Celtis tetrandra *Roxb.*
 Holoptelea integrifolia *Pl.*
 Trema orientalis *Bl.*

VERBENACEAE

Gmelina arborea *Roxb.*
 Lantana camara *L.*
 Premna latifolia *Roxb.*
 Premna tomentosa *Willd.*
 Tectona grandis *L. f.*
 Vitex altissima *L. f.*

VITACEAE

Cissus pallida *Pl.*

MONOCOTYLEDONS**ARECACEAE**

Phoenix humilis *Royle*

T	r	A	S	r	A,B
T	O	A,B	T	r	A,B
L	O	A,B			
S	C	A,B			
T	O	A,B	t	C	A
T	O	A,B	L	C	A,B
T	O	A	S	O	A,B
			T	C	A
			T	O	A,B
L	O	A,B			
			T	O	A,B
L	C	A,B	T	O	A
L	O	A	t	O	A,B
L	C	A,B			
L	C	A			
T	O	A,B	T	r	B
			t	O	A,B
			S	C	A,B
			T	r	A
L	C	A,B	T	O	A
			T	C	A
			t	C	A
S	r	A,B			
T	C	A,B	L	O	A,B
S	r	A,B	S	r	A
S	C	A,B	T	C	A,B
t	r	A,B	S	O	B
T	O	A,B			
T	O	A,B			
T	r	A	T	O	A
t	O	A,B	T	O	A,B
T	r	A,B	T	r	A
T	C	A			
S	O	A			
S	C	A			
S	O	A,B	T	r	A,B
t	O	A,B	S	C	A,B
			T	C	A
			T	O	A,B
			T	O	A
			T	O	A,B
T	O	A,B			
T	O	A			
T	r	A,B			
t	r	A			
t	O	A,B			
S	C	A,B			
T	O	A			
T	O	A,B			
T	O	A,B			
T	C	A,B			
			L	O	A
			t	O	A,B

DIOSCOREACEAE

Dioscorea oppositifolia *L.*

Dioscorea pentaphylla *L.*

LILIACEAE

Asparagus racemosus *Willd.*

POACEAE

Dendrocalamus strictus *Nees*

L	C	A,B
L	C	B
L	C	A,B
T	C	A,B

SMILACACEAE

Smilax perfoliata *Lour.*

GYMNOSPERMS

GNETACEAE

Gnelum ula *Brogn.*

I.	O	A
L	O	B

**ELAEOCARPUS TUBERCULATUS - MICHELIA CHAMPACA -
CANARIUM STRICTUM TYPE**

DICOTYLEDONS				ELAEOCARPACEAE			
ACANTHACEAE				Elaeocarpus serratus <i>L.</i>	I,II	C	
Nilgirianthus heyneanus (<i>Nees</i>) <i>Brem.</i>	H	C		Elaeocarpus tuberculatus <i>Roxb.</i>	I,E	C	
ANACARDIACEAE				EUPHORBIACEAE			
Mangifera indica <i>L.</i>	I,E	C		Antidesma menasu <i>Miq. ex Tul.</i>	III,IV	O	
Spondias pinnata (<i>L.f.</i>) <i>Kurz</i>		O	M	Bischofia javanica <i>Bl.</i>	I,II	C	
ANNONACEAE				Emblica officinalis <i>Gaertn.</i>	III	O	M,D
Uvaria narum (<i>Dunal</i>) <i>Wall. ex Wt. & Arn.</i>	L	C		Glochidion neilgherrense <i>Wt.</i>	III	r	M
APIACEAE				Glochidion velutinum <i>Wt.</i>	III	O	M
Centella asiatica (<i>L.</i>) <i>Urb.</i>	H			Macaranga peltata (<i>Roxb.</i>) <i>M. Arg.</i>	I,III	O	Op
APOCYNACEAE				Mallotus philippensis (<i>Lam.</i>) <i>M. Arg.</i>	II,III	C	
Carissa inermis <i>Vahl</i>	L	O		Mallotus tetracoccus (<i>Roxb.</i>) <i>Kurz</i>	II,III	O	Op
ARALIACEAE				FABACEAE (Caesalpinioideae)			
Schefflera capitata (<i>Wt. & Arn.</i>) <i>Harms</i>	II,III	O		Acrocarpus fraxinifolius <i>Wt.</i>	I,E	O	D
BIGNONIACEAE				Caesalpinia decapetala (<i>Roth</i>) <i>Alston</i>	L	C	M
Oroxylum indicum (<i>L.</i>) <i>Benth. ex Kurz</i>	III	r	M,D	Cassia fistula <i>L.</i>	III	O	M,D
Radermachera xylocarpa (<i>Roxb.</i>) <i>K. Schum.</i>	III	O	M,D	Mezoneuron cucullatum (<i>Roxb.</i>) <i>Wt. & Arn.</i>	L	r	
Stereospermum colais (<i>Buck.-Ham. ex Dillw.</i>) <i>Mabberley</i>	I	O	M,D	FABACEAE (Faboideae)			
BORAGINACEAE				Dalbergia latifolia <i>Roxb.</i>	I	O	M,D
Cordia macleodii (<i>Griff.</i>) <i>J. Hk. & Th.</i>	III	r	M,D	Dalbergia paniculata <i>Roxb.</i>	I	O	M,D
BURSERACEAE				Erythrina stricta <i>Roxb.</i>	III	O	M,D
Canarium strictum <i>Roxb.</i>	I,II	C	Op	Pterocarpus marsupium <i>Roxb.</i>	I,II	O	M,D
CAPRIFOLIACEAE				FABACEAE (Mimosoideae)			
Viburnum punctatum <i>Buch.-Ham. ex D. Don</i>	II,III			Acacia pennata (<i>L.</i>) <i>Willd.</i>	L	O	M
CELASTRACEAE				Albizia odoratissima (<i>L.f.</i>) <i>Benth.</i>	I,II	O	M,D
Cassine glauca (<i>Rottb.</i>) <i>Kuntze</i>	I,E	O		Entada pursaetha <i>DC.</i>	L	C	
COMBRETACEAE				FLACOURTIACEAE			
Terminalia alata <i>Heyne ex Roth</i>	I	O	M,D	Casearia ovata (<i>Lam.</i>) <i>Willd.</i>	II,III	O	
Terminalia bellirica (<i>Gaertn.</i>) <i>Roxb.</i>	I	O	M,D	Scolopia crenata (<i>Wt. & Arn.</i>) <i>Clos.</i>	III,IV	C	
				ICACINACEAE			
				Nothapodytes nimmoniana (<i>Grah.</i>) <i>Mabberley</i>	IV	O	
				LAURACEAE			
				Actinodaphne lawsonii <i>Gamble</i>	II,III	O	
				Actinodaphne malabarica <i>Balak</i>	II,III	r	
				Cinnamomum sulphuratum <i>Nees</i>	II,III	C	
				Cinnamomum travancoricum <i>Gamble</i>	II,III	C	
				Cryptocarya neilgherrensis <i>Meissn.</i>	II	C	

Litsea deccanensis <i>Gamble</i>	III	O		Syzygium cumini (L.) <i>Skeels</i>	I,II	C	
Litsea floribunda (Bl.) <i>Gamble</i>	II	C		Syzygium malabaricum (Bedd.)	IV	C	
Neolitsea zeylanica (Nees) <i>Merr.</i>	II,III	C		<i>Gamble</i>			
Persea macrantha (Ness) <i>Kosterm.</i>	I	C		OLEACEAE			
Phoebe paniculata <i>Nees</i>	II,III	C	IV	Chionanthus ramiflora <i>Roxb.</i>	III	O	M
LECYTHIDACEAE				Jasminum azoricum <i>L.</i>	CI	C	
Careya arborea <i>Roxb.</i>	II,III	O	M,D	Ligustrum perrottetii <i>A. DC.</i>	III	O	M
MAGNOLIACEAE				Olea glandulifera <i>Wall. ex G. Don</i>	II	O	
Michelia champaca <i>L.</i>	I,E	C		PIPERACEAE			
MALPIGHIACEAE				Peperomia sp.	Ep	C	
Hiptage benghalensis (L.) <i>Kurz</i>	L	C		Piper hymenophyllum <i>Miq.</i>	C	C	
MALVACEAE				RHAMNACEAE			
Kydia calycina <i>Roxb.</i>	II	O	M,D	Scutia myrtina (Burm.f.) <i>Kurz</i>	CI	O	
MELASTOMATACEAE				Ziziphus rugosa <i>Lam.</i>	IV	O	M
Memecylon lushingtonii <i>Gamble</i>	III	r	Op	ROSACEAE			
Memecylon talbotianum <i>Brandis</i>	III,IV	r		Prunus ceylanica (Wt.) <i>Miq.</i>	II		
MELIACEAE				Rubus fairholmianus <i>Gard.</i>	L		M
Aphanamixis polystachya (Wall.)				Rubus niveus <i>Thunb.</i>	L		M
<i>Parker</i>	I	C		RUBIACEAE			
Chukrasia tabularis <i>A. Juss.</i>	I	O		Canthium dicoccum (Gaertn.) <i>Merr.</i>	II,III	C	
Cipadessa baccifera (Roth) <i>Miq.</i>	S	C		Catunaregam torulosa (Dennst.)			
Munronia pinnata (Wall.) <i>Harms</i>	H	O		<i>Tirven.</i>	III	C	Op
Toona ciliata <i>M. Roem.</i>	I,II	C	Op	Chasalia ophioxylodes (Wall.) <i>Craib.</i>	S	O	
Trichilia connaroides (Wt. & Arn.)				Meyna laxiflora <i>Robyns</i>	III	C	Op
<i>Bent.</i>	II	r	Op	Mussaenda glabrata (J. Hk.) <i>Hutch.</i>	S	O	M
<i>ex Gamble</i>				<i>ex Gamble</i>	S	O	
MENISPERMACEAE				Pavetta indica <i>L.</i>	S	O	Op
Cocculus laurifolius <i>DC.</i>	IV	C		Pavetta tomentosa <i>Roxb. ex J.E. Sm.</i>	S	r	
Diploclisia glaucescens (Bl.) <i>Diels</i>	L	C		Psychotria bisulcata <i>Wt. & Arn.</i>	IV	C	
MORACEAE				Psychotria elongata (Wt.) <i>J. Hk.</i>	IV	C	
Artocarpus heterophyllus <i>Lam.</i>	II	O		Psychotria nigra (Gaertn.) <i>Alston</i>			
Ficus hispida <i>L.f.</i>	II	r		Wendlandia thyrsoides	III,IV	O	M
Ficus microcarpa <i>L.f.</i>	I,II	O		<i>(Roem. & Schult.) Steud.</i>			
Ficus mollis <i>Vahl</i>	II	O		RUTACEAE			
Ficus nervosa <i>Heyne ex Roth</i>	I,II	r		Atalantia wightii <i>Tanaka</i>	IV	C	
Ficus racemosa <i>L.</i>	II	O		Clausena indica (Dalz.) <i>Oliver</i>	IV	O	
Ficus talbotii <i>King</i>	II	r		Euodia lunu-ankenda (Gaertn.) <i>Merr.</i>	III	C	
Ficus tsjahela <i>N. Burman</i>	I	C		Murray a paniculata (L.) <i>Jack.</i>	IV	O	
Ficus virens <i>Aiton</i>	I	C		Toddalia asiatica (L.) <i>Lam.</i>			
MYRISTICACEAE				var. floribunda (Wall.) <i>Gamble</i>	L	C	
Myristica dactyloides <i>Gaertn.</i>	II	r		SABIACEAE			
MYRSINACEAE				Meliosma pinnata (Roxb.) <i>Walp.</i>	I,II	C	
Ardisia solanacea <i>Roxb.</i>	IV			ssp. arnottiana (Walp.) <i>Beus.</i>			
Maesa indica (Roxb.) <i>DC.</i>	IV			Meliosma simplicifolia (Roxb.) <i>Walp.</i>	II	C	
ssp. pungens (Walp.) <i>Beus.</i>				SALICACEAE			
MYRTACEAE				Salix tetrasperma <i>Roxb.</i>	I,E	O	
Eugenia thwaitesii <i>Duthie</i>	IV	r					

SAPINDACEAEAllophylus cobbe (*L.*) *Raeusch.*Dimocarpus longan *Lour.*Sapindus laurifolia *Vahl***SAPOTACEAE**Xantolis tomentosa (*Roxb.*) *Raf.***STERCULIACEAE**Eriolaena hookeriana *Wt. & Arn.*Helicteres isora *L.*Sterculia guttata *Roxb. ex DC.***SYMPLOCACEAE**Symplocos cochinchinensis (*Lour.*)
Moore ssp. *laurina* (*Retz.*) *Noot.***TILIACEAE**Grewia tiliifolia *Vahl***ULMACEAE**Celtis tetrandra *Roxb.*Trema orientalis (*L.*) *Bl.***URTICACEAE**Elatostema lineolatum *Wt.*Procris crenata *C. Robinson*Villebrunea integrifolia *Gaud.***VERBENACEAE**Callicarpa tomentosa (*L.*) *Murray*Clerodendrum viscosum *Vent.*Gmelina arborea *Roxb.*Lantana camara *L.*var. *aculeata* (*L.*) *Mold.***VITACEAE**

Cayratia sp.

MONOCOTYLEDONS**ARACEAE**

Arisaema sp.

ARECACEAECalamus gamblei *Becc.***LILIACEAE**Asparagus racemosus *Willd.***POACEAE**

Dendrocalamus sp.

SMILACACEAESmilax perfoliata *Lour.***ZINGIBERACEAE**Globba bulbifera *Roxb.***GYMNOSPERMS****GNETACEAE**Gnetum ula *Brogn.*

**MESUA FERREA - PALAQUIUM ELLIPTICUM -
OLEA GLANDULIFERRA TYPE**

DICOTYLEDONS						
ACANTHACEAE				Antidesma menasu <i>Miq. ex Tul.</i>	III, IV	C
<i>Nilgiranthus barbatus (Nees) Brem.</i>	S	O		<i>Bischofia javanica Bl.</i>	I, II	C
<i>Nilgiranthus heyneanus (Nees) Brem.</i>	H	C		<i>Epiprinus mallotiformis (M. Arg.)</i>		
				<i>Croizat</i>	I, II	C
ANACARDIACEAE				<i>Glochidion sp.</i>	III	r
<i>Mangifera indica L.</i>	I	r		<i>Macaranga peltata (Roxb.) M. Arg.</i>	II, III	O
				<i>Mallotus philippensis (Lam.) M. Arg.</i>	II, III	O
ANNONACEAE				<i>Mallotus stenanthus (Lam.) M. Arg.</i>	III, IV	O
<i>Meiogyne pannosa (Dalz.) Sinclair</i>	III, IV	C	WG	<i>Mallotus tetracoccus (Roxb.) Kurz</i>	III	O
<i>Uvaria narum (Dunal) Wall. ex</i>				<i>Neopeltandra longipes Gamble</i>	III	O
<i>Wt. & Arn.</i>	L	O		FABACEAE (Caesalpinioideae)		Op
				<i>Acrocarpus fraxinifolius Wt.</i>	I+E	O
APOCYNACEAE				FABACEAE (Faboideae)		
<i>Carissa inermis Vahl</i>	L	r		<i>Indet.</i>	C	O
<i>Indet.</i>	L	D		FLACOURTIACEAE		
ARALIACEAE				<i>Cascaria ovata (Lam.) Willd.</i>	I, II	C
<i>Schefflera capitata (Wt. & Arn.) Harms</i>	III	O		<i>Scolopia crenata (Wt. & Arn.) Clos.</i>	I, I, I	O
ASTERACEAE				LAURACEAE		
<i>Vernonia monosis C.B. Clarke</i>	III	O	O D, M	<i>Actinodaphne lawsonii Gamble</i>	I, II	C
BURSERACEAE				<i>Actinodaphne malabarica Balak.</i>	II	r
<i>Canarium strictum Roxb.</i>	I	O		<i>Beilschmiedia wightii Benth. ex J. Hk.</i>	I, I	O
CAPRIFOLIACEAE				<i>Cinnamomum malabathrum (Burm.f.)</i>		
<i>Viburnum punctatum Buch.-Ham.</i>				<i>Kosterm.</i>	I, I, I	C
<i>ex D. Don</i>	II	O		<i>Cinnamomum keralaense Kosterm.</i>	I	O
CELASTRACEAE				<i>Cryptocarya neilgherrensis Meissn.</i>	II	C
<i>Cassine glauca (Rottb.) Kuntze</i>	I+E	O		<i>Litsea floribunda (Bl.) Gamble</i>	II	C
CLUSIACEAE				<i>Litsea oleoides (Meissn.) J. Hk.</i>	I+E	C
<i>Mesua ferrea L.</i>	I	C		<i>Neolitsea zeylanica (Nees) Merr.</i>	I, II	C
EBENACEAE				<i>Persea macrantha (Nees) Kosterm.</i>	I	O
<i>Diospyros ovalifolia Wt.</i>	I	r		<i>Phoebe paniculata Nees</i>	I, II	C
<i>Diospyros sylvatica Roxb.</i>	I	r		LOGANIACEAE		
ELAEOCARPACEAE				<i>Fagraea ceilanica Thunb.</i>	St.	O
<i>Elaeocarpus serratus L.</i>	I, II	O		MAGNOLIACEAE		
<i>Elaeocarpus tuberculatus Roxb.</i>	I+E	C	R	<i>Michelia champaca L.</i>	I+E	O
EUPHORBIACEAE				MALPIGHIACEAE		
<i>Agrostistachys meeboldii Pax & Hoffm.</i>	II, III	C		<i>Hiptage benghalensis (L.) Kurz</i>	L	
				MELASTOMATACEAE		
				<i>Memecylon lushingtonii Gamble</i>	III, IV	Op

MELIACEAE				Toddalia asiatica (L.) Lam.	L	O	
Aglaiia jainii Viswa. & Rama.	I,II	O		var. floribunda (Wall.)Gamble			
Aphanamixis polystachya (Wall.) Parker	I,II			Zanthoxylum tetraspermum Wt. &Arn.	L	O	
Munronia pinnata (Wall.) Harms	H			SABIACEAE			
Toona ciliata M. Roem.	I		Op,M	Meliosma pinnata (Roxb.) Walp.			
MENISPERMACEAE				Ssp. arnottiana (Walp.) Beus.	I,II	O	
Cocculus laurifolius DC.	IV	O		Meliosma simplicifolia (Roxb.) Walp.			
MORACEAE				Ssp. pungens (Walp.) Beus.	II	C	
Artocarpus heterophyllus Lam.	II	O		SAPINDACEAE			
Ficus microcarpa L.f.	I,II	O		Allophylus cobbe (L.) Raeusch.	L		Op
Ficus nervosa Heyne ex Roth	I,II	O		Dimocarpus longan Lour.	I+E	C	
Ficus laevis Bl. var. macrocarpa (Miq.) Corner	L	r		SAPOTACEAE			
MYRISTICACEAE				Chrysophyllum lanceolatum (Bl.) DC.	I	r	
Myristica dactyloides Gaertn.	I,II	O		Isonandra perrottetiana DC.	II,III	C	
MYRSINACEAE				Palaquium ellipticum (Dalz.) Baillon	I+E	C	
Ardisia pauciflora Heyne ex Roxb.	IV	O		SOLANACEAE			
MYRTACEAE				Solanum giganteum Jacq.	S	C	Op
Syzygium cumini (L.) Skeels	I,II	O		STERCULIACEAE			
Syzygium gardneri Thw.	I+E	r		Sterculia guttata Roxb. ex DC.	II,III	O	Op
Syzygium hemisphericum (Wt.) Alston	III,IV	O		SYMPLOCACEAE			
OLEACEAE				Symplocos cochinchinensis (Lour.) Moore ssp. laurina (Retz.) Noot.	III,IV	O	M
Chionanthus mala-elengi (Dennst.) P.S. Green	IV	r		ULMACEAE			
Chionanthus ramiflora Roxb.	I,II,III	C	Op,M	Celtis tetrandra Roxb.	I,II	O	Op
Olea glandulifera Wall. ex G. Don	I,II	O		Trema orientalis (L.) Bl.	III	C	Op
PIPERACEAE				URTICACEAE			
Peperomia sp.	Ep	C		Debregeasia longifolia (N. Burman) Wedd.	IV	C	Op
Piper hymenophyllum Miq.	L	C		Elatostema lineolatum Wt.	H	C	
ROSACEAE				Procris crenata C. Robinson	Ep	C	
Prunus ceylanica (Wt.) Miq.	II	r		Villebrunea integrifolia Gaud.	III, IV	C	Op
RUBIACEAE				VERBENACEAE			
Chasalia ophioxylodes (Wall.) Craib.	H	C		Callicarpa tomentosa (L.) Murray	III, IV	C	Op
Coffea arabica L.	S	C		Clerodendrum serratum (L.) Moon	IV	O	
Psychotria elongata (Wt.) J. Hk.	S	C		Clerodendrum viscosum Vent.	III, IV	C	Op
RUTACEAE				VITACEAE			
Atalantia wightii Tanaka	S	O		Cayratia sp.	L	C	
Clausena dentata (Willd.) Roem. & Schult.	S	O		MONOCOTYLEDONS			
Euodia lunu-ankenda (Gaertn.) Merr.	II	O		ARACEAE			
Murraya paniculata (L.) Jack.	IV	O	Op	Arisaema sp.	H	C	

ARECACEAE Calamus gamblei <i>Becc.</i>	L	C	
LILIACEAE Ophiopogon intermedius <i>D. Don</i>	H	C	
ORCHIDACEAE Anoectochilus elatior <i>Lindl.</i> Geodorum densiflorum (<i>Lam.</i>) <i>Schlechter.</i>	H H	O C	

GYMNOSPERMS				
GNETACEAE Gnetum ula <i>Brong.</i>	L	O		
PTERIDOPHYTES				
CYATHEACEAE Cyathea gigantea (<i>J. Hk.</i>) <i>Holtum</i>	IV	r	R	

**DIOSPYROS OVALIFOLIA - MEMECYLON LUSHINGTONII -
OLEA GLANDULIFERA TYPE**

DICOTYLEDONS				GESNERIACEAE			
ACANTHACEAE				Aeschynanthus perrottetii DC.	Ep	C	
Nilgirianthus heyneanus (Nees) Brem.	H	C		ICACINACEE			
ANACARDIACEAE				Nothapodytes foetida (Wt.) Sleumer	t	C	
Nothopodia beddomei Gamble	T	r		LAURACEAE			
ANNONACEAE				Cinnamomum travancoricum Gamble	T	C	
Milusa eriocarpa Dunn	t,S	C		Litsea floribunda (Bl.) Gamble	T	C	
Uvaria narum (Dunal) Wall. ex Wt. & Arn.	C	C		Neolitsea zeylanica (Nees) Merr.	T	C	
				Persea macrantha (Nees) Kosterm.	T	O	
				Phoebe paniculata Nees	t	C	
ARALIACEAE				LOGANIACEAE			
Schefflera capitata (Wt. & Arn.) Harms	t	O	*	Fagraea ceilanica Thunb.	St	r	*
ASTERACEAE				MALPIGHIACEAE			
Vernonia monosis C.B. Clarke	T	O	M,*	Hiptage benghalensis (L.) Kurz	C	C	
BORAGINACEAE				MALVACEAE			
Ehretia canarensis (Clarke) Gamble	S	r		Abutilon sp.	S	O	
CELASTRACEAE				MELIACEAE			
Cassine glauca (Rottb.) Kuntze	T	r		Aphanamixis polystachya (Wall.) Parker	T	r	
Euonymus crenulatus Wall. ex Wt. & Arn.	S	C		Cipadessa baccifera (Roth) Miq.	S	C	
EBENACEAE				Toona ciliata M. Roem.	T	r	
Diospyros ovalifolia Wt.	T	VC		Trichilia connaroides (Wt. & Arn.) Bent.	T	O	M
ELAEAGNACEAE				MELASTOMATACEAE			
Elaeagnus kologa Schlecht.	C	O		Memecylon lushingtonii Gamble			
EUPHORBIACEAE				MENISPERMACEAE			
Antidesma menasu Miq. ex Tul.	t	C		Cocculus laurifolius DC.	t	O	
Bischofia javanica Bl.	T	C		MORACEAE			
Croton laccifer L.	t	r	M,*	Ficus microcarpa L.f.	T	O	
Glochidion neilgherrense Wt.	T	C	M	Ficus nervosa Heyne ex Roth	T	r	
Macaranga peltata (Roxb.) M. Arg.	T	O	Op	Ficus tsjahela N. Burman	T	C	
Mallotus philippensis (Lam.) M. Arg.	T	VC		MYRSINACEAE			
Mallotus tetracoccus (Roxb.) Kurz	T	O	Op	Maesa indica (Roxb.) DC.	S	C	
FLACOURTIACEAE				Rapanea wightiana (Wall. ex DC.) Mez.	t	O	*
Casearia ovata (Lam.) Willd.	T	r					
Scolopia crenata (Wt. & Arn.) Clos.	t	C					

MYRTACEAE

Syzygium cumini (L.) Skeels	T	C		Dimocarpus longan Lour.	T	r	
				Sapindus laurifolia Vahl	T	O	Op

OLEACEAE

Chionanthus ramiflora Roxb.	T	C	M				
Jasminum azoricum L.	C	C					

Ligustrum perrottetii A. DC.	t		M				
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Olea glandulifera Wall. ex G. Don	T	C					
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PIPERACEAE

Piper hymenophyllum Miq.	C	C					
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ROSACEAE

Prunus ceylanica (Wt.) Miq.	T	r					
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RUBIACEAE

Canthium dicocum (Gaertn.) Merr.	T	VC					
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Ixora notoniana Wall. ex G. Don	t	O	*				
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Meyna laxiflora Robyns	t	O	Op				
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Pavetta indica L.	S	O					
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Psychotria nigra (Gaertn.) Alston	S	O					
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Tarenna asiatica (L.) Schumann forma. rigida (Wt.) Raju	t,S	O	*				
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RUTACEAE

Atalantia wightii Tanaka	t,S	C					
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Clausena indica (Dalz.) Oliver	S	C					
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Euodia lunu-ankenda (Gaertn.) Merr.	T	C					
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Murraya koenigii (L.) Spreng.	S	O					
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Murraya paniculata (L.) Jack.	S	C	M				
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Toddalia asiatica (L.) Lam.							
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Var. floribunda (Wall.) Gamble	C	C					
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SABIACEAE

Meliosma pinnata (Roxb.) Walp.							
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ssp. arnottiana (Walp.) Beus.	T	O	*				
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Meliosma simplicifolia (Roxb.) Walp.							
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ssp. pungens (Walp.) Beus.	T	O					
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SAPINDACEAE

Allophylus cobbe (L.) Raeusch.	L	C					
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SAPOTACEAE

Xantolis tomentosa (Roxb.) Raf.	T	O	*				
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SOLANACEAE

Solanum sp.	H	C					
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STERCULIACEAE

Sterculia guttata Roxb. ex DC.	T	C	Op,D				
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ULMACEAE

Celtis tetrandra Roxb.	T	O	Op,D				
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Celtis timorensis Span.	T	C					
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URTICACEAE

Elatostema lineolatum Wt.	H	VC					
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VERBENACEAE

Callicarpa tomentosa (L.) Murray	t	C	M				
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VITACEAE

Cayratia sp.	C	C					
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MONOCOTYLEDONS**LILIACEAE**

Asparagus racemosus Willd.	C	C					
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Ophiopogon intermedius D. Don	H	C					
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SMILACACEAE

Smilax perfoliata Lour.	C	O					
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PTERIDOPHYTES**LYCOPODIACEAE**

Lycopodium phlegmaria L.	H	C					
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**SCHEFFLERA SPP. - GORDONIA OBTUSA -
MELIOSMA ARNOTTIANA TYPE**

DICOTYLEDONS								
ACANTHACEAE	H	C				ELAEAGNACEAE		
Nilgiranthus sp.						Elaeagnus kologa <i>Schlecht.</i>	L	C
ANACARDIACEAE						ELAEOCARPACEAE		
Holigarna arnottiana <i>J. Hk.</i>	I	r				Elaeocarpus munroii (<i>Wt.</i>) <i>Mast</i>	I	C
Mangifera indica <i>L.</i>	II	O				Elaeocarpus serratus <i>L.</i>	I	C
ARALIACEAE						Elaeocarpus tuberculatus <i>Roxb.</i>	I	O
Schefflera capitata (<i>Wt. & Arn.</i>) <i>Harms</i>	I	C				EUPHORBIACEAE		
Schefflera micrantha <i>Gamble</i>	I	O				Agrostistachys indica <i>Dalz.</i>	II	O
Schefflera racemosa <i>Harms</i>	I	C				Agrostistachys meeboldii <i>Pax</i> & <i>Hoffm.</i>	I,II	r
Schefflera venulosa <i>Harms</i>	St	C				Antidesma menasu <i>Miq. ex Tul.</i>	III	C
Schefflera wallichiana <i>Harms</i>	St	r				Aporosa sp.	II	C
ARISTOLOCHIACEAE						Daphniphyllum neigherrense <i>Ros.</i>	II	C
Apama siliquosa <i>Lam.</i>	S	O				Dimorphocalyx lawianus <i>J. Hk.</i>	III	O
ASTERACEAE						Glodchidion ellipticum <i>Wt.</i>	II,III	C
Vernonia arborea <i>Ham.</i>	I	C				Glodchidion fagifolium <i>J. Hk.</i>	II,III	r
BALSAMINACEAE						Glodchidion neilgherrense <i>Wt.</i>	II,III	C
Impatiens sp.	H	O				Glodchidion zeylanicum <i>A. Juss.</i>	II,III	O
BURSERACEAE						Macaranga peltata (<i>Roxb.</i>) <i>M. Arg.</i>	II	O
Canarium strictum <i>Roxb.</i>	I	O				Mallotus philippensis (<i>Lam.</i>) <i>M. Arg.</i>	I,II	C
CAPRIFOLIACEAE						Mallolus tetracoccus (<i>Roxb.</i>) <i>Kurz</i>	II	O
Viburnum punctatum <i>Buch.-Ham.</i> <i>ex D. Don</i>	I	C				Sauropus androgynus <i>Merr.</i>	S	O
CELASTRACEAE						FABACEAE(Faboideae)		
Celastrus paniculatus <i>Willd.</i>	L	O				Derris sp.	L	O
Euonymus crenulatus <i>Wall.</i>	II	C				FABACEAE (Mimosoideae)		
Euonymus dichotomus <i>Heyne</i>	II	O				Archidendron monadelphum (<i>Roxb.</i>) <i>Neilsen</i>	II	O
CLUSIACEAE						FLACOURTIACEAE		
Garcinia gummu-gutta (<i>L.</i>) <i>Robson</i>	I	C				Casearia coriacea <i>Thw.</i>	II,III	C
Garcinia pictorius (<i>Roxb.</i>) <i>D'Arey</i>	I	r				Casearia rubescens <i>Dalz.</i>	II,III	O
CONVOLVULACEAE						Flacourtia montana <i>Graham</i>	II	O
Argyreia sp.	L	O				Hydnocarpus alpina <i>Wt.</i>	I	O
DILLENACEAE						Scolopia crenata (<i>Wt. & Arn.</i>) <i>Clos.</i>	II	C
Dillenia pentagyna <i>Roxb.</i>	I	O				ICACINACEAE		
						Apodytes benthaminana <i>Wt.</i>	II	O
						Gomphandra coriacea <i>Wt.</i>	II,III	O
						LAURACEAE		
						Actinodaphne malabarica <i>Balak</i>	I	O
						Alseodaphne semecarpifolia <i>Nees</i> var. angustifolia <i>Meisner</i>	I	C

Apollonias arnottii <i>Nees</i>	II	O		OLEACEAE				
Beilschmiedia wightii <i>Benth. ex J. Hk.</i>	I	O		Jasminum sp.	L	O		
Cinnamomum sulphuratum <i>Nees</i>	I,II	C		Ligustrum gamblei <i>Ramam.</i>	II,III	C	M	
Cinnamomum verum <i>Presl.</i>	I	O		Olea dioica <i>Roxb.</i>	II	O		
Cinnamomum wightii <i>Meissn.</i>	I	C		PIPERACEAE				
Cryptocarya lawsonii <i>Gamble</i>	I	r		Piper sp.	L			
Cryptocarya neilgherrensis <i>Meissn.</i>	I	C		PITTOSPORACEAE				
Litsea bourdillonii <i>Gamble</i>	I,II	O		Pittosporum neelgherrense <i>Wt. & Arn.</i>	III	O	M	
Litsea floribunda (<i>Bl.</i>) <i>Gamble</i>	I,II	C		Pittosporum tetraspermum <i>Wt. & Arn.</i>	III	C	M	
Litsea oleoides <i>J. Hk.</i>	II	C		RANUNCULACEAE				
Litsea stocksii <i>J. Hk.</i>	I	C		Clematis gouriana <i>Roxb.</i>	L	O		
Neolitsea zeylanica (<i>Nees</i>) <i>Merr.</i>	II	C		RHAMNACEAE				
Persea macrantha (<i>Nees</i>) <i>Kosterm.</i>	I	C		Scutia myrtina (<i>Burm.</i>) <i>Kurz</i>	L	C		
Phoebe wightii <i>Meisn.</i>	II	C		RUBIACEAE				
LEEACEAE				Canthium neilgherrense <i>Wt.</i>	III,S	r		
Leea indica (<i>Burm.</i>) <i>Merr.</i>	III,S	O		Hedyotis stylosa <i>Br.</i>	H	C		
LOGANIACEAE				Ixora nigricans <i>Wt. & Am.</i>	III,S	O		
Fagraea ceilanica <i>Thunb.</i>	II	O		Ixora notoniana <i>Wall.</i>	S	C		
LYTHRACEAE				Lasianthus rostratus <i>Wt.</i> Psychotria	S	C		
Lagerstroemia microcarpa <i>Wt.</i>	I	r		elongata <i>J. Hk.</i> Psychotria	S	C		
MAGNOLIACEAE				globicephala <i>Gamble</i> Psychotria	S	O		
Michelia champaca <i>L.</i>	I	r		truncata <i>Wall.</i>	S	O		
MELASTOMATACEAE				Randia sp.	S	O		
Memecylon gracile <i>Bedd.</i>	III	O		Saprosma sp.	II	C		
Memecylon malabaricum (<i>CL.</i>) <i>Cogn.</i>	III	C		Tarenna asiatica (<i>L.</i>) <i>Schumam</i>	S	C		
MELIACEAE				Tricalysia apiocarpa <i>Gamble</i>	II	r		
Toona ciliata <i>M. Roemer</i>	I	O		Wendlandia thyrsoides (<i>R. & S.</i>)	III	C	M	
Trichilia connaroides (<i>Wt. & Arn.</i>)				<i>Steudel</i>				
<i>Bent.</i>	I	O		RUTACEAE				
MYRISTICACEAE				Acronychia pedunculata (<i>L.</i>) <i>Miq</i> Euodia	II	C		
Myristica dactyloides <i>Gaertn.</i>	I	O		lunu-akenda (<i>Gaertn.</i>) <i>Merr.</i> Toddalia	I,II	r		
MYRSINACEAE				asiatica (<i>L.</i>) <i>Lam.</i>	L	C		
Ardisia rhomboidea <i>Wt.</i>	III,S	r		var. floribunda (<i>Wall.</i>) <i>Gamble</i>	I	r		
Ardisia solanacea <i>Roxb.</i>	III,S	C		Zanlhoxyllum rhetsa (<i>Roxb.</i>) <i>DC.</i>				
Ardisia sonchifolia <i>Mez.</i>	III,S	O		SABIACEAE				
Rapanea sp.	S	C		Meliosma pinnata (<i>Roxb.</i>) <i>Walp.</i>				
MYRTACEAE				ssp. arnottiana (<i>Wt.</i>) <i>Beus.</i> Meliosma	I	C		
Eugenia mooniana <i>Wt</i>	II	O		simplicifolia (<i>Roxb.</i>) <i>Walp.</i>				
Rhodomyrtus tomentosa <i>Wt.</i>	II,III	C		ssp. pungens (<i>Walp.</i>) <i>Beus.</i>	I	C		
Syzygium arnottianum <i>Walp.</i>	II	C		SAPINDACEAE				
Syzygium caryophyllatum (<i>L.</i>) <i>Alston</i>	I	C		Dimocarpus longan <i>Lour.</i>	I	C		
Syzygium cumini (<i>L.</i>) <i>Skeels</i>	I	O		SAPOTACEAE				
Syzygium hemisphericum (<i>Walp.</i>)				Isonandra montana <i>Gamble</i>	II	C		
<i>Alston</i>	II	O		SCROPHULARIACEAE				
Syzygium rubicundum <i>Wt. & Arn.</i>	II	C		Sopubia delphinifolia (<i>L.</i>) <i>Don</i>	H	O		

STAPHYLEACEAE

Turpinia cochinchinensis (Lour.) Merr.

Turpinia malabarica *Gamble*

SYMPLOCACEAE

Symplocos cochinchinensis (Lour.)

Moore ssp. lauriana (Retz.) Noot.

Symplocos macrophylla Wall. ex DC.

Symplocos racemosa Roxb.

THEACEAE

Gordonia obtusa Wt. & Arn.

URTICACEAE

Debregeasia longifolia (Burm.) Wedd.

Elatostema lineolatum Wt.

VERBENACEAE

Callicarpa tomentosa (L.) Murray

VITACEAE

Cayratia sp.

MONOCOTYLEDONS

ARACEAE

Arisaema leschenaultii Bl.

ARECACEAE

Calamus huegelianus Mart.

Caryota urens L.

PANDANACEAE

Pandanus sp.

SMILACACEAE

Smilax sp.

**SCHEFFLERA CAPITATA - NEOLITSEA ZEYLANICA -
MELIOSMA spp. TYPE**

DICOTYLEDONS				Macaranga peltata (Roxb.) M. Arg.	T	O	Op
ACANTHACEAE				Mallotus philippensis (Lam.) M. Arg.	T	C	
Barleria involucrata Nees	S	C	M	Mallotus tetracoccus (Roxb.) Kurz	T	O	Op
Nilgirianthus foliosus (Wt.) Brem.	S	C	M	Phyllanthus polyphyllus Willd.	S	r	M,Op
Nilgirianthus heyneanus (Nees) Brem.	H	C		Securinega virosa (Roxb. ex Willd.)			
Nilgirianthus sp.	S	C		Pax & Hoffm.	S	r	Op
APOCYNACEAE				FABACEAE (Caesalpinioideae)			
Carissa inermis Vahl	L			Cassia fistula L.	T	r	Op
Rauwolfia densiflora (Wall.) Benth.				FABACEAE (Mimosoideae)			
ex J. Hk.	t	C		Albizia chinensis (Osbeck) Merr.	T	r	Op
AQUIFOLIACEAE				FLACOURTIACEAE			
Ilex denticulata Wall.	t	C		Casearia ovata (Lam.) Willd.	T	C	
ARALIACEAE				Scolopia crenata (Wt. & Arn.) Clos.	T	C	
Schefflera capitata (Wt. & Arn.) Harms	T	C		ICACINACEAE			
Schefflera rostrata (Wt.) Harms	St	O		Nothapodytes foetida (Wt.) Sleumer	t	C	
var. micrantha (Clarke) Mahesh.				LAURACEAE			
ASTERACEAE				Actinodaphne lawsonii Gamble	T	C	
Vernonia monosis C.B.Clarke	T	C	M	Cinnamomum sulphuratum Nees	T	C	
CAPRIFOLIACEAE				Cinnamomum travancoricum Gamble	T	C	
Viburnum coriaceum Bl.	t	C	M	Cryptocarya neilgherrensis Meissn.	T	C	
Viburnum punctatum Buch.-Ham.				Litsea floribunda (Bl.) Gamble	T	C	
ex D. Don	T	O	R	Neolitsea zeylanica (Nees) Merr.	T	C	
CELASTRACEAE				Persea macrantha (Nees) Kosterm.	T	O	
Cassine glauca (Rottb.) Kuntze	T	O		Phoebe paniculata Nees	T	C	
Celastrus paniculatus Willd.	L	C		LOGANIACEAE			
Euonymus crenulatus Wall.				Fagraea ceilanica Thunb.	St	C	
ex Wt. & Arn.	S,t	C		Gardneria ovata Wall.	L	O	
ELAEAGNACEAE				MALPIGHIACEAE			
Elaeagnus kologa Schlecht.	L	O	M	Hiptage benghalensis (L.) Kurz	L	C	
ELAEOCARPACEAE				MELIACEAE			
Elaeocarpus munronii (Wt.) Masters	T	r		Aphanamixis polystachya (Wall.)			
Elaeocarpus serratus L.	T	O		Parker	T	O	
EUPHORBIACEAE				Cipadessa baccifera (Roth) Miq.	S	C	
Bischofia javanica Bl.	T		R	Toona ciliata M. Roem.	T	O	
Daphniphyllum neilgherrense (Wt.)				MENISPERMACEAE			
Rosenth.	T	C	M	Cocculus laurifolius DC.	t	O	
Glochidion neilgherrense Wt.	T	C	M	MORACEAE			
Glochidion velutinum Wt.	T	O	M	Artocarpus heterophyllus Lam.	T	r	

<i>Ficus nervosa Heyne ex Roth</i>	T	O		SABIACEAE			
MYRSINACEAE				<i>Meliosma pinnata (Roxb.) Walp.</i>	T	C	
<i>Ardisia solanacea Roxb.</i>	S	C		ssp. <i>arnottiana (Walp.) Beus.</i>			
<i>Maesa indica (Roxb.) DC.</i>	S	C		<i>Meliosma simplicifolia (Roxb.) Walp.</i>	T	C	
<i>Rapanea wightiana (Wall. ex DC.) Mez.</i>	T	C	M	ssp. <i>pungens (Walp.) Beus.</i>			
MYRTACEAE				SALICACEAE			
<i>Eugenia thwaitesii Duthie</i>	t	r		<i>Salix tetrasperma Roxb.</i>	t	r	R
<i>Syzygium cumini (L.) Skeels</i>	T	C:		SAPINDACEAE			
<i>Syzygium densiflorum Wall. ex Wt.</i>				<i>Allophylus cobbe (L.) Raeusch.</i>	L	C	
& Arn.	T	C	M	SAPOTACEAE			
OLEACEAE				<i>Isonandra perrottetiana DC.</i>	T	C	M,Op
<i>Chionanthus ramiflora Roxb.</i>	T	C	M	<i>Xantolis tomentosa (Roxb.) Raf.</i>	T	C	
<i>Jasminum azoricum L.</i>	L	C		SOLANACEAE			
<i>Jasminum rotterianum DC.</i>	L	C		<i>Solanum laeve Dunal</i>	H	C	Op
<i>Ligustrum perrottetii A. DC.</i>	T	C	M	STERCULIACEAE			
<i>Olea glandulifera Wall. ex G. Don</i>	T	C		<i>Sterculia guttata Roxb. ex DC.</i>	T	O	Op
PIPERACEAE				SYMPLOCACEAE			
<i>Piper hymenophyllum Miq.</i>	L	C		<i>Symplocos cochinchinensis (Lour.)</i>			
PITTOSPORACEAE				<i>Moore ssp. laurina (Retz.) Noot.</i>	t	C	M,Op
<i>Pittosporum neelgherrense Wt. & Arn.</i>	T	O	M	<i>Symplocos foliosa Wt.</i>	T	C	
RHAMNACEAE				THEACEAE			
<i>Ziziphus rugosa Lam.</i>	S,t	C		<i>Eurya nitida Korthals</i>	S,t	O	
ROSACEAE				ULMACEAE			
<i>Prunus ceylanica (Wt.) Miq.</i>	O	T		<i>Celtis tetrandra Roxb.</i>	T	O	Op
<i>Rubus fairholmianus Gard.</i>	L	C	M	<i>Celtis timorensis Span.</i>	T	C	
<i>Rubus niveus Thunb.</i>	L	O	M	<i>Trema orientalis (L.) Bl.</i>	S,t	C	Op
RUBIACEAE				VERBENACEAE			
<i>Canthium dicoccum (Gaertn.) Merr.</i>	T	C		<i>Callicarpa tomentosa (L.) Murray</i>	t	C	Op,M
<i>Catunaregam torulosa (Dennst.) Tirven.</i>	t	O	Op	<i>Clerodendrum viscosum Vent.</i>	t	C	Op
<i>Ixora notoniana Wall. ex G. Don</i>	t	C	M	VITACEAE			
<i>Lasianthus venulosus Wt.</i>	S	r		<i>Cayratia sp.</i>	L	C	
<i>Pavetta indica L.</i>	S	O		MONOCOTYLEDONS			
<i>Psychotria elongata (Wt.) J. Hk.</i>	S	C		LILIACEAE			
<i>Psychotria nigra (Gaertn.) Alston</i>	S	C		<i>Asparagus racemosus Willd.</i>	L	C	
<i>Tarenna asiatica (L.) Schumann</i>				SMILACACEAE			
forma. <i>rigida (Wt.) Raju</i>	S,t	C	M	<i>Smilax perfoliata Lour.</i>	L	C	
<i>Wendlandia thyrsoides</i>				GYMNOSPERMS			
(Roem. & Schult.) Steud.	S,t	C	M	GNETACEAE			
RUTACEAE				<i>Gnetum ula Brogn.</i>	L	O	
<i>Atalantia wightii Tanaka</i>	S	O					
<i>Euodia lunu-ankenda (Gaertn.) Merr.</i>	T	r					
<i>Murraya paniculata (L.) Jack.</i>	S	C	M				
<i>Toddalia asiatica (L.) Lam.</i>							
var. <i>floribunda (Wall.) Gamble</i>	L	C					
<i>Zanthoxylum tetraspermum</i>							
Wt. & Arn.	L	O					