

FLORA OF COURTALLUM

VOLUME 1

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M. P. THAKUR

BOTANICAL SURVEY OF INDIA

FLORA OF COURTALLUM

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FLORA OF COURTALLUM

Volume 1

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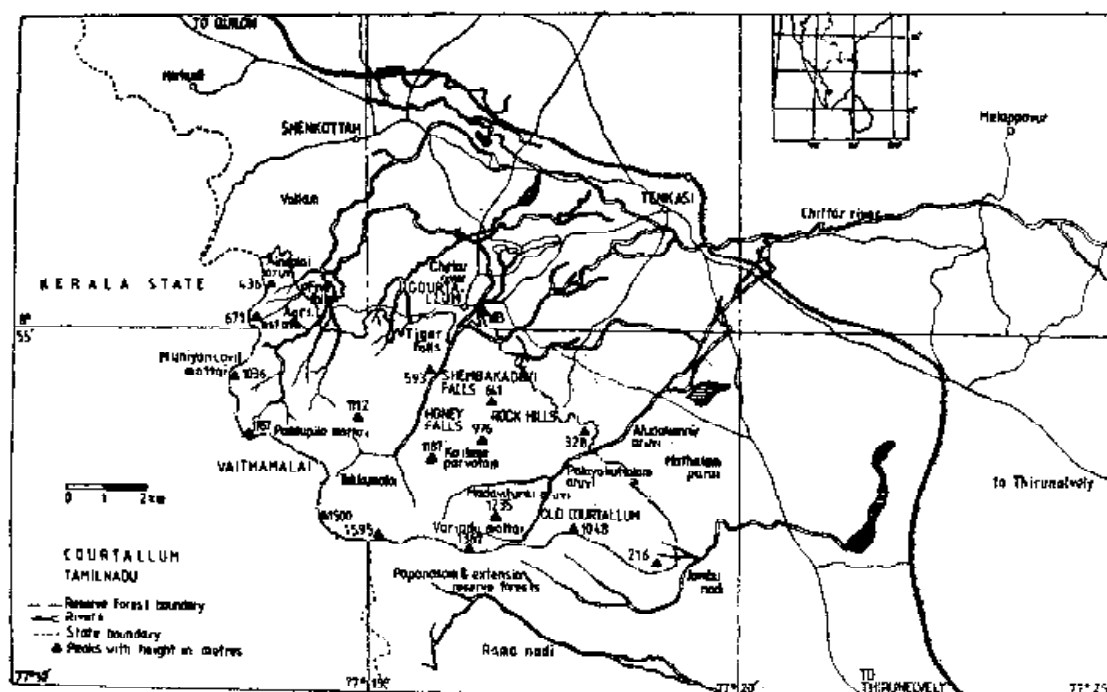
FOREWORD

Courtallum (Kuttalam) is botanically rich and a centre for floristic study to students of botany, ever since Robert Wight (1835-36) botanised the region. During my college days, I have joined University College, Trivandrum, excursion tours (1949-51) and the memories are evergreen, as the forests surrounding Kuttalam hills, and fresh as the sparkling fresh waters of the waterfalls. The first task which I undertook while working in the Botanical Survey of India at Coimbatore during 1957-58, was the study of the flora of Kuttalam along with the then Regional Botanist of the Circle. The results of these explorations could not be published as they were incomplete.

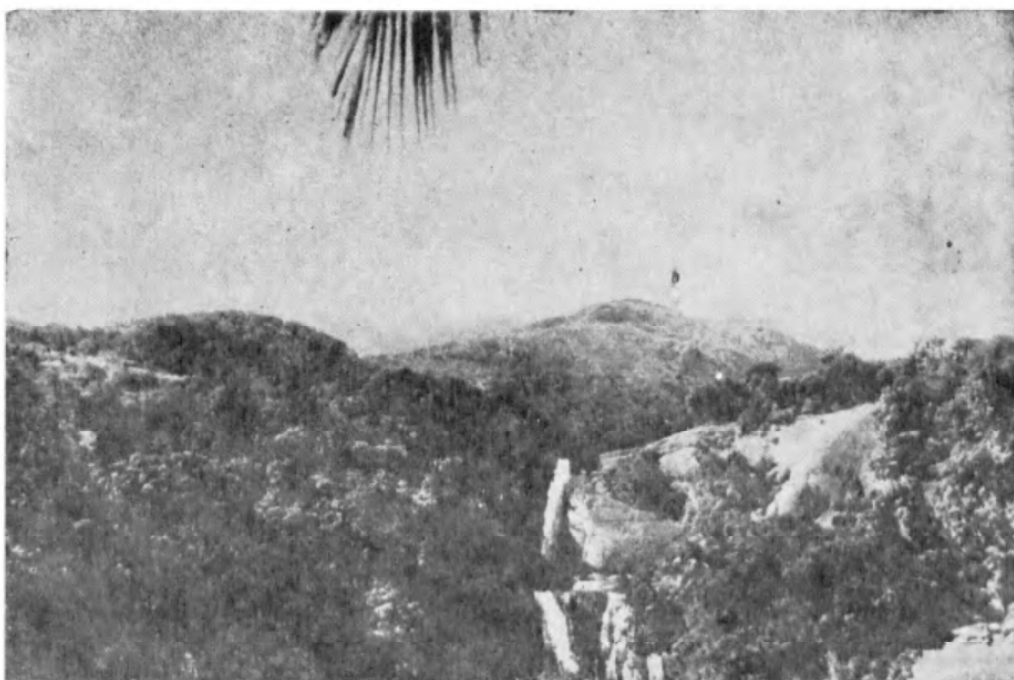
I have assigned this problem of the study of Kuttalam flora to K.K.N. Nair, one of my research students in 1973. He has completed the survey of the flora, during the period 1973-80, under my guidance. The introduction chapter gives a well documented floristic panorama of 745 taxa of flowering plants, both indigenous and naturalized. The dominant flowering plant families are Poaceae, Fabaceae, Euphorbiaceae, Acanthaceae and Asteraceae. Due to biotic pressures, the floristic components are gradually getting rare. Some of the species collected by Robert Wight (1835-36) could not be collected even after repeated surveys. I hope this book will be useful to students and teachers of Botany.

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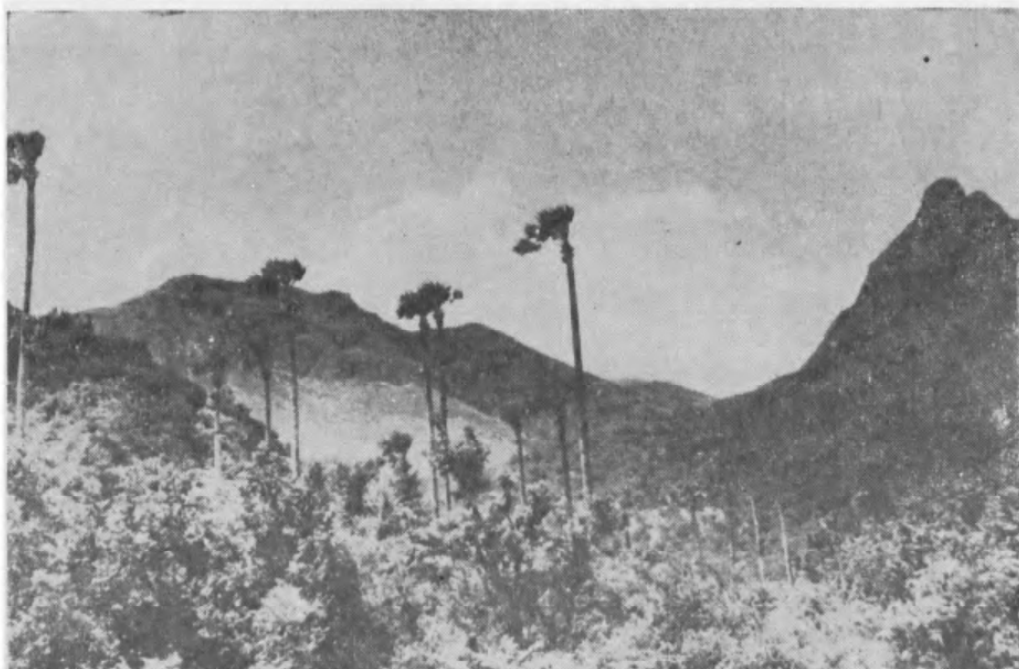
Map of Courtallum, Tamilnadu



Courtallum mountain ranges—a general view from Mainfalls



Honey falls



Old Courtallum—a general view



Vegetation at Old Courtallum



Old Courtallum with southern thorn forests



Old Courtallum falls

INTRODUCTION

Courtallum (Kuttalam) is a floristically well known area in the Western Ghats (India), ever since Robert Wight (1835 - 36) botanised this region and brought out an itinerary of his exploration. Thereafter, students and researchers regularly visited the locality to fetch materials of their interest or to enrich various herbaria. However, such sporadic collections have not so far led to the bringing out of an exhaustive flora of the region.

Botanically, the flora of the mountains of Courtallum is much reputed for high rate of endemism. This is because of the unique geographical position of the area, being located opposite to the Aryankavu Pass (Shenkottah Pass). It is also due to this reason that the flora here is basically an admixture of elements characteristic of both West Coast (Malabar Coast) and Deccan plateau, which in turn is well represented by Sri Lankan and Malesian species. Phytogeographically, the flora also shows affinities to that of North-eastern India whereas it is poorly represented by African and North-West Indian elements. It is worthwhile to note here that Courtallum flora with such unique characteristics be preserved for posterity.

Economic potentials of the flora is yet another remarkable feature. It abounds in very rare medicinal plants and because of this, even the river waters here are considered to have curative effects to many diseases. Being excessively exploited by local people and pharmaceutical firms, many such species have now become very scarce and unless checked, this valuable resource will not sustain for long. Same is the case with regard to canes and other rare minor forest produces. The monsoon forests of the area also abode a variety of timber species with high commercial value.

In recent times, Courtallum acquired the status of an important tourist centre and health resort in the whole of South India. This is mainly due to the presence of a number of panoramic waterfalls, cascades and bathing spots in a sylvian environment coupled with religious sanctity. The picturesque beauty of the place and the refreshing climate also attract many, apart from those visiting the region for nature study and plant collections. Such visitors go far interior in the forests, where tourist attractions like Honey falls, Shembagadevi, Swamiar falls, etc. are situated.

During 1973 - 80, the authors prepared this exhaustive flora of the region at Central National Herbarium, Botanical Survey of India (CAL), based on thorough explorations and critical study of the collections from

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the area subsequent to Robert Wight (1835-36). The Flora enumerates 745 taxa of flowering plants with dichotomous keys at family, genus and species levels, up-to-date nomenclature, diagnostic descriptions and phenology of each of them. It is hoped that this study will be of some help to botanists, phytogeographers, conservationists and also naturalists.

HISTORY

From a historical point of view, the district of Tirunelveli is reputed as the seat of the earliest Dravidian civilization. Archeological remains of this civilization, sculptural urns, etc. are found in the red gravel of the hills bordering the district and in Courtallum ghats also such remnants are seen. The temple of Kuttalanthaswami at Courtallum is one of the oldest temples of the district and in legends it is connected with the rishi 'Agastya'. The river Chittar is considered as the 'Ganges' by Hindus and Tenkasi as the 'South Kasi' (Banaras) of the south as the name indicates.

LOCATION

Courtallum (Kuttalam, Therucottalam, Courtalam, Courtallam, Cootalam, etc.) the famous waterfalls and sanitorium in Tenkasi taluk of Tirunelveli district (Thirunelvelly, Tinnevely, etc.) in Tamil Nadu State, lies within 8° 50' & 9° 0' North latitude and 77° 10' & 77° 20' East longitude. It is about 86 kilometres from Tirunelveli town and about 7 kilometres from the Tenkasi town and railway station. There is a trunk road leading from Tirunelveli through Madurai, Tenkasi and Courtallum and in its onward route crosses the Aryankavu Pass to Quilon and thence forth to Trivandrum. Around Courtallum there is a network of branch roads connecting it by short routes with all the main roads of the neighbourhood.

Geographically the area lies a few kilometres south of Achenkovil and Aryankavu Pass of the Western Ghats which connects this portion of the country to the State of Kerala on the West Coast. It is a spur on the eastern side of the Western Ghats facing the Aryankavu Pass and is bounded by Kulathurpuzha reserve forests of Kerala State on the Western side, Papanasam and Extension reserve forests of Kadaiyanallur range in Tirunelveli district on the southern side and the plains of Tenkasi and Shencottah taluks on the eastern and northern sides.

BOTANICAL HISTORY

For many years Malabar coast occupied a pioneering area in the study of Indian Botany and the first recorded works comes from West Coast namely *Os Coloquinos* from Goa in the middle of 16th century and *Hortus Malabaricus* at the close of 17th century. Later the centre of activity was centered in East Coast due to the efforts of devoted botanists like J.G. Koenig and other associated Danish Missionaries of the 'United Brethren' such as Klein, Rottler and Heyne. Later on Roxburgh (1795) described many of his collections from Peninsular India in his magnificent work *Plants of the Coromandel*. Many of the collections of Heyne and others were novelties to plant science which Roxburgh (1820-24) published in his *Flora Indica* and Wallich (1821-49) listed in his work the *Wallichian Catalogue*. Apart from these works on the flora of Peninsular India in general, the history of explorations and publications made on the flora of Courtallum and adjoining areas are summarised here.

Period I (up to 1900 A.D.)

The earliest botanical exploration of Courtallum dates back to the year 1834 when Robert Wight, the British Physician stationed at Madras made exhaustive collections of plants from the mountainous tracts of Courtallum and adjacent area. In his *Observations on the Flora of Courtallum* (1835-36), Wight briefly described the results of his expedition, giving geographical features of the area covered by him, general distribution of the different life-forms there and native elements of the flora. Only the natural orders of flowering plants were accounted with the curious or economic species known from the area and all other collections were not listed there. However, as learned from this work, as many as 600 species were collected by him from there and this number excludes many of the common species and those large trees for which he could not collect specimens due to inaccessibility. Such collections, and those made from the adjoining mountainous tracts of Western Ghats were used in his work *Prodromus Florae Indiae Orientalis* (1834) jointly published with Walker Arnott. For reasons unknown, the highly desirable volume forming Part II of the *Prodromus* was never published even though an illustrated account of the published part came as *Illustrations of Indian Botany* (1840, 1850). But a more utilization of Wight's collections from Courtallum and Peninsular India in general is seen in his *Icones Plantarum Indiae Orientalis* (1838-53) which contains several new taxa and illustrations of South Indian Plants which even today is a reliable source of information for plant taxonomists. The extensive collections of Wight representing some 3,200 taxa were transferred to Kew (U.K.) and was later listed by J.D. Hooker who made use of them while compiling the *Flora of British India* (1872-97).

In the first half of 1850's, Geiden Thomson made large collections of plants from Courtallum hills as understood from J.D. Hooker and T. Thomson's (1855) *Flora Indica*, several of which were new to Science. Several of these collections are now represented at Central National Herbarium in good condition. However, our present knowledge of their work on the flora is scanty due to lack of published literature on the same. Likewise few collections of plant specimens from Courtallum were traced in *Herb. T. Anderson* and *Herb. Stocks* represented at Central National Herbarium, but little is known about their work on the flora.

The only other historically important collection from Tirunelveli Hills is that of R.H. Beddome, who made extensive collections in the forests of South India and brought out the results of his floristic and taxonomic studies in the work entitled *The Flora Sylvatica of Southern India* (1869-74) and *Icones Plantarum* (1869-74). However in this extensive work for the region no special reference is made on the flora of Courtallum area. But in his *Observations on the Forest Flora of Tinnevely District*, Beddome (1877) emphasized the need for a thorough study of the tracts south of Courtallum as many new trees were found in the area. Here Beddome gave a brief account of the flora by listing few interesting species there and those of timber value.

J.D. Hooker (1872-97) in his *Flora of British India* also dealt with a large number of plants collected from Courtallum by Leschnault, Anderson, Wight, Beddome and others and with his vast knowledge on Indian Flora brought out *A Sketch of the Flora of British India* (1904, 1907), dividing the area covered in the flora into smaller botanical provinces based on phytogeography. In this division, Courtallum comes under the 'Malabar Province'.

Period II (1900-1950)

In the first half of the 20th century, C.A. Barber, T.F. Bourdillon, D. Hooper, C.C. Calder, M.S. Ramaswamy, M. Rama Rao, Venkoba Rao and P.F. Fyson botanised the forests of Courtallum. As understood from the specimens at Central National Herbarium and Herbarium of the Southern Circle, Botanical Survey of India, Coimbatore, C.A. Barber (1900-1902) made sporadic collections of plants from Courtallum and adjoining areas. But he never published the results of his explorations and this material later formed the basis for several new taxa described by Gamble (1919, 1920, 1925) and Dunn (1914) who studied his collections while working on *The Flora of the Presidency of Madras*. Most of the collections of Barber from the area are represented at Central National Herbarium and Herbarium of the Southern Circle, Botanical Survey

of India, Coimbatore, in addition to those present at the Herbarium, Royal Botanic Gardens, Kew.

Both Bourdillon (1908) and M. Rama Rao (1914) who worked on the flora of the then Travancore State, visited the hills of Tirunelveli for plant studies. But their collections are quite few from Courtallum. In 1914, M.S. Ramaswamy visited Tirunelveli hills and made exhaustive collections from those areas like Papanasam, Tenkasi and Ambasamudram. In his account *A botanical tour to Tinnevely hills* (1914). Ramaswamy published his work on the flora of this region as a family wise enumeration of 470 species with their distribution in India, Burma and Sri Lanka. It is evident from this publication that he had not included Courtallum in his studies.

In Gamble's (1915-35) *Flora of the Presidency of Madras* a total of 64 species were recorded from Courtallum, mostly based on Wight's and C.A. Barber's collections. Since the publication of this flora there is practically no recorded work on the botany of Courtallum or adjacent areas till the middle of 1950's.

Period III (1950 onwards)

In recent times the importance of vegetational analysis and statistical methods of interpreting the floristic data received more attention and C.R. Mudaliar and D.D. Sunderaraj's (1954) work on the flora of Tirunelveli is one of this sort. They had given a statistical account of the flora of the district along with the geology, geography, forest types and floristic elements (only comparative analysis of the floristic elements there and those in the Gamble's *Flora of the Presidency of Madras*) of the region including Courtallum in general.

In the year 1954-55, B.G.L. Swamy and E. Govindrajlu made two excursions to Courtallum during the months of September-October and collected 206 species of flowering plants which they enumerated in *On a collection of plants from Courtallum* (1956) with a brief introductory description and route-map of their botanisation of much use in educative purposes.

During 1957-58, K. Subramanyam assisted by M.P. Nayar collected about 637 taxa of flowering plants and ferns from Courtallum Reserve forests and adjacent plains which is not published in any form and since then the contribution towards the flora of this part of Western Ghats is practically nil till 1968 when J.X. Arachi of the Palayamkottah College brought out a *Pictorial Presentation of Indian Flora, a Special Study Courtallum* in which he enu-

merated about 405 species of Angiosperms, unauthentically identified and without any key, nomenclature or descriptions.

From the botanical history of Courtallum outlined here, it is evident that none of the aforesaid works is complete in any respect with regard to the total floristic data of the area. All such earlier collections from Courtallum are now available in the major Indian Herbaria like Central National Herbarium (CAL), Herbarium of the Southern Circle, Botanical Survey of India (MH) and Herbarium of the Presidency College, Madras (PCM) in addition to those represented at the Herbarium, Royal Botanic Gardens, Kew (K), were critically examined during the present study and thus had an opportunity to include them in the Flora in addition to the exhaustive collections which the authors made from Courtallum.

PHYSIOGRAPHY

Topographically Courtallum is much varied. Slowly rising from the plains are a chain of mountains varying in their altitudes, connected by narrow valleys, ravines and ridges. The mountain ranges here show a considerable diminution both in their height and breadth when compared to the adjacent portions of Western Ghats and this is one of the major causes for the climatic peculiarities unique for the spot. In general the approximate height of the ghat here varies from about 180 metres to 1,600 metres. The highest peak in the area is the Courtallum peak which almost corresponds to the Valratti mottai given in the toposheets and is about 1595 metres above the mean sea-level. The area is traversed by three small rivers, the Chittar, Aindalai aruvi and the Palayakuttalam aruvi (which continues in the plains of Tenkasi around Mathalamparai as the Aludakannir aruvi) and their tributaries. In the course of their descent from the mountain ranges where they originate to the plains of Tenkasi, these rivers present several cascades and waterfalls adding to the natural beauty of the spot. Among the rivers mentioned, the river Chittar, 'the little river' or in its Sanskrit form 'Chitranaadhi' is the major one which has got its source of water in the hills, is a beautiful river and in their forward course both Aindalai aruvi (Aithalarivi, Fivefalls river) and Palayakuttalam aruvi (Old Kuttalam aruvi, Aluthakannir aruvi) joins Chittar. The river Chittar in turn joins the Thambraparni river a few kilometres north-east of the Tirunelveli town which after a south-easterly course of about 115 kilometres empties itself into the Gulf of Mannar.

As mentioned earlier, of these rivers, the river Chittar is the most important one for its size, central position and several 'falls' that it presents during the course of its descent to the plains of Tenkasi. The

'Mainfalls' as it is designated in further descriptions, otherwise called the 'Courtallum falls' or 'Vadaarivi' in literature is the most important one among them and is the final descent of the river Chittar from the ghats to the plains below, is situated adjacent to Courtallum Township. The 'falls' is about 50 metres in height coming down in different steps with magnificent splash. The bordering rocks are inscribed with numerous 'Sivalingams' and about a 100 metre away from the bathing spot below the 'falls' is the temple of Kuttalanthaswami, the lord of Courtallum. Adjacent to this is the 'Thirthavari mandapam' just by the side of the pool below the falls.

Belonging to Courtallum temple, a few metres away on an elevated open plateau is another temple known as the 'Chitra Sabhai' and is dedicated to the God Nataraja. In front of this temple is the pond 'Thippakkulam' with an elaborately ornamented 'Gopuram' in the middle where during January a floating festival is celebrated. The pond when in full during monsoon possesses several floating aquatic plants like *Pistia* sp. and in summer when it is almost dry, several semiaquatic formations of *Polygonum glabrum*, *Hygrophila salicifolia*, *Hydrilla verticillata*, *Limnophila heterophylla* and other members of *Scrophulariaceae* and *Commelinaceae* are common. Around the temple are several 'mandapams' and kitchens used by pilgrims and local people.

The vegetation around Mainfalls is generally of the South Indian dry deciduous and wet deciduous type and above the falls as the stream is much slowed in its pace, a marshy area is formed in summer, where several semiaquatic and aquatic species of *Commelinaceae*, *Gentianaceae* and *Scrophulariaceae* find their natural habitats.

Towards the western side of the Mainfalls, about 200 metres from it is a small cascade called the 'Chittaruvi' made into a bathing spot. The flora around this spot is mostly shrubaceous with a good number of climbers and lianas and a rich undergrowth. Below Chittaruvi falls is the foresters campüs for the Courtallum reserve forests.

About half a kilometre east of the Mainfalls is another bathing spot and cascade called the Tigerfalls (Puliyaruvi) formed by the sudden descent of a small side stream originated from below Shembagadevi, higher up in Chittar. Tigerfalls area is mostly rocky towards its upper side where one can find several thorny trees and lianas towards the Mainfalls side and mostly xerophytic plants towards the Shembagadevi side which is designated here as the Rock hill. The outskirts around Tigerfalls harbour the South Indian dry deciduous forests. There is a forest path leading from Tigerfalls towards the interior of the forests which traverse a small valley and thenceforth ascends into the ghat terminating in a spot called the

Newfalls (Kattathan Aruvi). The forest around and below this falls is luxuriant showing mainly the characters of the wet deciduous forest type. Around the falls are several aquatic and semiaquatic species.

Higher up in Chittar, connected by forest paths are two more falls, the Shembagadevi falls (Shembagadevi Aruvi) and the Honey falls (Tenaruvi), the former about 2.5 kilometres from the foothills of Courtallum and the latter about 2 kilometres further up again. The Shembagadevi falls is a low cascade of about 15 metres in height and is less important except for its proximity to the Shembagadevi temple often visited by pilgrims. The flora around Shembagadevi towards the eastern side of the stream is typically moist deciduous type and those towards the western side show a higher percentage of evergreen elements. Below and along the sides of the stream flowing from the Shembagadevi falls to the Mainfalls, several aquatic and semiaquatic plants find their natural habitats. As the valleys bordering the stream are broad, a luxuriant vegetation is found there which includes several gigantic trees like *Sterculia guttata*, alongwith an undergrowth of several species of *Annonaceae*, *Acanthaceae* and *Rubiaceae*. At the mouth of Shembagadevi falls and along the shallow water courses above the rocks, several green algae find their abode. From Shembagadevi, below it, is a small side stream flowing to Tiger falls through the interior of the forests to a short distance and thenceforth along the sides of the rocky mountainous area which ends in Tiger falls. Apart from a few common plants like *Syzygium cumini* and *Opelia amentacea* along the sides of the stream, on the barren rocky hill top are seen *Polycarpaea corymbosa*, *Euphorbia antiquorum* and several species of *Ficus*. It is from Shembagadevi that water for Courtallum township is taken, for which a separate canal and a tank is made inside the reserve forest with pipe way below.

Honeyfalls is a magnificent cascade descending about 30 metres from the top of hill through a vertical cleft in the rock. The sides of the 'falls' possess a luxuriant evergreen vegetation. Below the falls, the sides of the ravines bordering the stream abode several lianas and the forest floor here is luxuriant in herbaceous elements of which a typical one is *Gynura lycopersicifolia*. Several species of ferns and few *Phyllanthus* are seen in the rock crevices near the mouth of the falls. Beyond the falls there is no forest path and the one leading from below towards the side leads to Tekkumalai, traversing the moist deciduous areas in between. Similarly from Chittaruvi, there is a newly built motorable way terminating at the entrance of Tekkumalai Estate.

Tekkumalai is situated in the Chittar Valley and most of the area of it is forming the present Tekkumalai (Thekkumalai, Terkumalai) estate

and this includes the old Arivikkarai and Pradesipudai estates prevalent there in 1869 (H. R. Pate, *Madras District Gazetteers, Tinnevely* p. 464. 1917). Mangosteens, Nutmegs, Cloves, Coffee, Cinnamomum, etc. are cultivated in the estate. Most of the plantations are confined to the banks of the river Chittar and adjacent valleys at lower altitudes. There is a path from the entrance of Tekkumalai estate from near the estate Superintendent's Office up to the estate Bungalow higher up, traversed by three wooden bridges across the river. Above the third wooden bridge the course of the path is not clear and if one proceed further up, at about 1,595 metres height the Courtallum peak becomes visible and this peak approximately corresponds to the 'Vairatti mottai' marked in the top-sheet of Courtallum.

As the area increases in height, the vegetation show a tendency to become the wet evergreen type. A sidepath along the sides of the Estate Bungalow leads to the base of Kailasa parvatham (Kailasamottai). This is a conical peak of about 1,197 metres in height and is practically inaccessible. The vegetation along the steep slopes towards its base is of the typical evergreen type. There is a tributary of Chittar coming through the valleys below Kailasaparvatham joining with it far below.

A well built road leading from Courtallum township after its almost westerly course for about 4 kilometres terminate at a spot called Fivefalls (Aindaruvi, Aindalai Aruvi, Aithalarivi). Here the river Aindalaruvi or Fivefalls river forms a five branched cascade which is about 15 metres in height, descending almost vertically. The forest in between the Mainfalls and Fivefalls is traversed by a forest path along its outskirts. It is in this region that large plantations of teak is found in Courtallum. The forest floor of these plantations as well as its outskirts and outer boundaries possess a less characteristic vegetation which can be grouped into the moist deciduous type given in subsequent pages. This includes several hedge species, few climbers and thorny shrubs in addition to the characteristic elements forming the forest type. The area is traversed by few rivulets joining with Aindalai Aruvi in the plains.

In the bordering valleys of the Aindalai Aruvi above the Fivefalls is a luxuriant vegetation which is of the moist deciduous type below and wet evergreen type above. Huge spreading trees with buttressing roots are common here. In the valleys and the slanting slopes along the sides of the stream towards its eastern side is the Tamil Nadu Government's Agricultural Estates and Orchard, rich in fruits and spice species along with several cultivars and introductions of horticultural interest. The estate possesses a ground flora mostly of a secondary type.

Higher up in the Aindalai river is the 'Swamiar falls'. This is a small cascade about 4 to 5 metres high with a regular spray of water moistening the bordering rocks and soil around. It is here that the curious endemic species *Epithema carnosum* finds its 'ecological niche' along with several semi-aquatic species of grasses, sedges and commelinas. Huge trees with buttressing roots and epiphytic plants are other features of this area. The top portion of the Agricultural estate around Swamiar falls is called the Udayathan estate which in its upper borders merge with the evergreen forests above. Recently a motorable road is made from the entrance of the Agricultural estate up to Swamiar falls. This picturesque spot is worth tourist's attention.

Opposite to the Agricultural estate towards its eastern side is the Ammathottam, a private estate, along the steep slopes of a rivulet of Aindalai Aruvi in between the two. Several cultivars of economic and horticultural value are found in this estate. The sides of the stream here is luxuriant in natural vegetation mainly of the evergreen type.

Along the eastern sides of the Agricultural Estate is a forest path leading to Vaithamalai, about 6 kilometers from there. The forests here is the most luxuriant shola type in the whole of Courtallum. Steep valleys, slopes and peaks characterise the topography of the area and along the depressions here flows a stream which originates higher up in the ghats and joins the Aindalai Aruvi in the plains. The typical evergreen type of forests found here extends up to Vaithamalai in the borders of Kerala State. Quite interior in this forest block is a spot called the 'Karuppuswami Kovil' where people give 'Puja' (worship) for security in the forests from wild animals. These areas roughly corresponds to the Pondupila mottai and Paradesi mottai given in the toposheet for the area and is about 1187 to 1500 metres in height. Towards the top of these mountain ranges, the steepness of its ascent diminishes and above Karuppuswami kovil there is a broad valley traversed by the stream. Vaithamalai estate is situated at the top of these mountains and it is almost a plain area mainly with plantations of Cardamom.

The mountain ranges towards the east of Courtallum proper are comparatively low in their altitude and less complicated in their topography when compared to those towards the west. Apart from few peaks like Vairadu mottai (1235 metres) and Kottal malai (1048 metres) most of the area covered by this portion of the Courtallum Reserve forests is the valleys of those hills. Old Courtallum (Palayakuttalam) is a spot of topographic importance here and is known for the Old Courtallum falls formed by the final descent of the Palayakuttalam Aruvi which continues as the Aludakannir Aruvi in the plains. The forest between Tigerfalls

and Old Courtallam falls is traversed by a forest path along its outskirts, which, below the peak Vairadu mottai takes an upward course culminating in the hill top. The forests here is traversed by several tributaries of Palayakuttalam Aruvi and they dry up during summer. The vegetation along the outskirts of the forests here is typically of the south Indian dry deciduous type and towards Old Courtallum and beyond that it changes into the thorny type characteristic of dry rocky areas. In the valleys of Vairadu mottai and Kottal malai are dense patches of evergreen vegetation apart from the wet or dry deciduous types common for the area. Beyond Old Courtallam falls, in the rocky area the vegetation is scanty and the forest descends in height to about 200 metres when it reaches the boundary of Papanasam and extension reserve forests. In this region there is a small streamlet called the Pondugal Aruvi forming a tributary of Jumbu Nadi which has its origin in the Papanasam reserve forests.

PHYTOGEOGRAPHY

In his classification of 1904, J. D. Hooker recognised nine 'botanical provinces' and the humid belt of the hilly or mountainous country extending from the mouth of the river Tapti to Cape Comerin he called the 'Malabar province' and in this phytogeographical division comes Courtallum. During this period C. B. Clarke (1898) also attempted a classification of the floristic regions of India on a more statistical basis and the phytogeographic subarea 'Malabarica' is recognised by him along with 'Coromandelia' to cover the Peninsular Indian region. On the basis of the comparative humidity or dryness of the area, Prain (1903) classified the 'malabar province' of J. D. Hooker and C. B. Clarke into the region 'India Aquosa' which covers the wet forest tracts along the western ghats from Gujrat to Kerala, receiving the full force of South-West monsoon. After the study of the endemic species of Dicotyledons in India, D. Chatterjee (1939) proposed a revised phytogeographical classification to Hooker's. In this classification also the 'Malabar region' as recognised by J. D. Hooker is accepted without any change. Thus it is evident that the different phytogeographers of the past agree in placing this part of western ghats in the 'Malabar province' of J. D. Hooker and 'India Aquosa' of Prain wherein Courtallum is situated.

In their assessment of the vegetation and phytogeography of Western ghats, Subramanyam and Nayar (1974) divided the region into four parts namely 1. The Western Ghats from river Tapti to Goa, 2. The Western Ghats from river Kalinadi to Coorg, 3. The Nilgiri and 4. The Annamalai, Palni and Cardamom Hills. Eventhough Tirunelveli Hills are not specifically mentioned by them in their sub-divisions, being a continua-

tion of Cardamom Hill with almost similar floristic composition and climatic conditions, it can also be included in the fourth region. Spate (1957) who illustrated the topography of these hills noted it as a remarkable group of mountains more complex than the Nilgiri and Anamudi of Peninsular India.

GEOLOGY AND SOIL

The geological basis of the area in general is a continuation of the gneiss rock considered to be of the archean age of which the mountains of the Western Ghats consists; in the plains it is largely covered by recent formations with protruding isolated patches or rounded and often conical masses of the underlying rocks.

Gneiss is the most common of the Archean system (Wadia, 1961), in which the mineral composition vary from granite to gabbro, but possess a banded structure designated as the 'gneissic'. They include granite, granodiorites, gneissic granites and banded or composite gneiss, the granite constituent of which show distinct signs of intrusion.

The underlying rock of gneissic or granitoid series is overlaiden by soils of the red series showing variations according to local factors. Specific information on the nature of the soil in Courtallum is rather meagre and it can be broadly classified into the black and the red series and about 92% of the area belongs to the later type. The red soil is derived from micaceous granite and gneiss are acidic and in reaction. They are deficient in nitrogen, phosphorous and lime and are often mixed with other soil types. In the foothills it is the red sandy loam called the 'Semman' and the less loamy type called the 'Sevval'. Here and there small pockets of medium black soil is also seen in the area.

Along the Ghats, laterite formations of varying depths are common. They are poor in their quality of water retentivity, exchange capacity and acidic in reaction. Other common soil constituents in the mountainous portion are undifferentiated hill soils, red gravelly soils and mixed red and black soils.

The outer fringes of the forest where rainfall is comparatively less and consequently weathering is a slow process, the soil is often shallow and is poor in humus content and this fact is often manifested in the poor type of vegetation found there. In contrast with this, in the forests, where too the soil is shallow with numerous rocky and bouldry outgrowths, due to the varied adverse factors acting on the soil layer, often a rich collection

of humus is seen. In the undulating and gentle slopes of the mountains the soil is often deeper and richer supporting the most luxuriant and valuable monsoon forests.

Along the river banks of Courtallum are found small alluvial deposits. The composition of this formation varies, and in general, are poor in nitrogen content though rich in many other plant nutrients. Alluvial soils are of not much importance as regards the evergreen monsoon forests, but it is in this soil that several of the aquatic and semiaquatic species grow.

The composition of the soil in the Old Courtallum area as recorded by Dabahoo and Subramanyam (1961) is as follows : 18.1% gravel; dark brown sandy loam ; 19.5% silt ; 5.5% clay; 75% sand ; water holding capacity 58.8%; pH 6.1 ; total soluble salt content 0.003% ; medium potash, low phosphate ; organic carbon 2.2% ; litter mixed, moderate, replaced annually.

CLIMATE

In general, the climate of Courtallum can be described as the 'tropical montane type'. It is characterised by light rainfall, an equable temperature and a remarkable dryness of the air even during the rainy weather. This peculiar dry weather compounded with light rainfall is due to the location of the area, being situated near the junction of the wet humid western side of the Western Ghats and it is proximal to the dry arid climate of the Tirunelveli plains.

Rainfall

In general Courtallum gets the full benefit of both South-West and North-East monsoons with a short gap in between forming the so called cold season which is scarcely distinct. The rainy season here commences by the onset of South-West monsoon in June-July and during this period the westerly winds blowing in through the Aryankavu pass of the Western Ghats from west coast bring with them dense clouds, with frequent showers covering the mountain tops with thick mist. With the onset of this season there is a considerable reduction in the atmospheric temperature, often 5-8°C below that of the adjoining plains. The eastern face of the ghats here enjoy the full benefit of this monsoon and the rivers and streams originating from the amphitheatre of the hills descent in great force during this season. It is in July and September that the downpour becomes heavy and an average of 20 to 25 cm of rain precipitates during this period. The cold season

commences here from November and continues up to January and during this period the temperature sometimes reaches 22°C marking the lowest minimum for the period. During cold season there are frequent showers from North-East monsoon.

North-East monsoon is less characteristic in Courtallum when compared to the South-West and is similar to any other part of the country it receives. It is precipitated mostly during the months of November to January averaging 1.5 to 14 cm in each month. This season passes on to summer and during the months of March to May, the thermometer reading exceeds 28° C in the plains and outskirts of the forests which becomes dry. But towards the interior of the ghats and in higher altitudes, humid conditions of the monsoon period are still retained by the thick shading there. The occasional 'Kodai' showers in summer season helps the sprouting of cattle grass in the plains as well as in the open forest areas. In June-July when other parts of the country is dry, Courtallum presents a green vegetation due to the prevalence of early monsoon. The monthly average rainfall during 1966-75 (10 years) is given in Table 1.

Table 1

Monthly average rainfall in cms.
from 1966-75 (10 years)

Month	Average Rain Fall	Remarks
January	1.52	
February	1.24	Month with the lowest average rainfall.
March	4.93	
April	4.61	
May	2.91	
June	20.62	
July	23.99	Month with the highest average rainfall.
August	17.91	
September	12.87	
October	20.32	
November	18.60	
December	14.18	

Temperature

In the mountainous environment of Courtallum, hottest months of the year are April and May when temperature exceeds 38°C on some of the hot sunny days. But when compared to the plains, the ghats are more cool due to thick shading. During those hot months of the year the temperature never goes below 19°C . But early in June as the South-West monsoon winds sets in, precipitation starts along the hill tops and the temperature there as well in the plains diminishes. In June-July a temperature ranging between $19-34^{\circ}\text{C}$, results in the 'salubrious climate' of Courtallum which continues up to the month of October. During this months of December and January the temperature sometimes comes down to 17°C marking the lowest minimum for the area. As rains cease by January-February except for a few occasional showers, the temperature gradually rises. This is hardly checked by the 'Kodai' rains whose effect on atmospheric temperature is rather negligible. The drought of summer is severe in the exposed areas and outskirts of the forest.

Winds

Strong westerly winds are frequent by the onset of South-West monsoon in May-June. This in turn carry with them monsoon clouds which are blown through the open outskirts and interior of the ghats. Sand, soil and debris which are often carried away by such winds are deposited in the plains. Sand-storms are also quite frequent during this period. In the remaining part of the year winds are moderate and during North-East monsoon it is slow-blowing. It is the peaks which are often exposed to strong winds sweeping over them.

Relative humidity

Dryness of the air even during the rainy season is a remarkable feature of the area. In June-July the mountain tops are often covered with mist formed by the slow and incomplete precipitation of dense monsoon clouds. This makes the adjoining areas of the forest highly humid and due to the thick shading and high precipitation the mountain tops harbouring the tropical wet evergreen forests are more humid when compared to the outskirts and other lower altitudes. In the rainless period of the year from January to April, there is some precipitation of mist in early morning which make the atmosphere humid.

VEGETATION

The manifold differences manifested in the habitats of the area had given rise to a correspondingly diverse vegetation which falls under three distinct categories, namely, the hydrophytic, rheophytic and mesic plants. The mesic plants which form the major part of the flora grow as

distinct formations designated as the Monsoon forests based on the prevailing climatic, soil and other habitat factors. The various ecological formations within the vegetation are discussed here under the following heads: Monsoon forests, Hydrophytes and Rheophytes

Monsoon forests

The monsoon forests of Courtallum with the strongly tropical floristic composition is essentially an outcome of the climatic factors and topographical position of the area. In general the vegetation of Western Ghats is influenced more by the abundance and distribution of seasonal rainfall than the atmospheric temperature (Subramanyam & Nayar, 1974) and this fact is clearly shown in the distribution of the different forest types in the area. The highest altitudes of the mountain ranges which get the full benefit of both the monsoons, southwest and northeast, is always in a humid state and it is in these wet humid parts of the ghat that the evergreen shola forests develop. The canopy is very dense in such areas which make the forest atmosphere cool and wet. For this reason, temperature has less influence on the vegetation in such areas. Contrary to this, in the outskirts and plains of the area soaked only by the northeast monsoon showers (as the southwest monsoon never descends to the plains of the rainshadow regions of Courtallum) the forest is dry in the greater part of the year. The vegetation between these two zones covering the slopes and valleys of the hills is in partial benefit of the southwest monsoon. Naturally, it is a mixture of wet deciduous and dry deciduous forests with the elements of the both the upper and lower bordering forest-types that flourish in such areas. Earlier, Nair and Nayar (1982) had briefly discussed the floristic composition and general distribution pattern of the monsoon forests of the area.

In the forest type classification of Champion and Seth (1968) monsoon forests of Courtallum comes under four distinct types, namely the southern tropical wet evergreen type, the southern moist deciduous type, the southern dry deciduous type and the southern thorn forest. Sankaranarayan (1960) who analysed the forest-types of Tirunelveli district did not record southern dry deciduous forest and southern thorn forest from Courtallum even though he recorded those types from the borders of Tenkasi taluk like Kottaimalai and Vasudevanallur reserve forests.

Southern tropical wet evergreen forests

The forest type under consideration has been differently named by various botanists. A. F. W. Schimper (1903) while defining it as 'evergreen, hydrophilous in character, at least 30 metres high, but usually much taller, rich in thick stemmed lianas and in woody as well as

herbaceous epiphytes' designated it as the 'tropical rain forest'. R. S. Troup (1921) and J. Burtt Davy (1938) proposed to call it the 'tropical evergreen rain forest' and to Kadambi (1941) it is the 'evergreen ghat rain forest' as the type exhibits certain peculiarities resulted from the ecological conditions which reign at the crest of the ghat where it occurs.

The type 'low level evergreen forest' as recognised within the Southern wet evergreen forest type by Burtt Davy (1938) and Champion and Seth (1968) is not recorded in Courtallum as the lower altitudes of the mountains here abode a different forest type due to less rainfall and several other ecological factors.

The forest type is characterised by the multiplicity of vegetational forms and an overall preponderance of greencover. Hence it is often described as a 'forest piled upon forest'. Their crown are crowded and sunlight hardly penetrates it even on the sunniest days except where some fallen or cut stem had made a temporary opening. The reduction in the size of the leaves as one proceed from the lower to the upper limits of the shola is also observed in the forest type. Epiphytes belonging to mosses, ferns, aroids, and balsams are common along the branches of shola trees. Woody climbers are rather common in the forest type reaching large dimensions. Ground flora is scarce in these areas and are formed of quite a few species of *Nilgirianthus*, *Begonia* and ferns along with some of those fleshy amaryllids, ground orchids and balsams. Grasses are almost absent in the sholas of Courtallum except for few tufts growing in the open areas there. Buttressing and cauliflory are characteristic of certain shola trees.

Top layer or emergent layer

The tier is otherwise called the ecodominant layer' and is composed of a variety of tree species, most of which are 20 to 30 metres in height. They are characterised by clean, smooth boles and dark green crown. The bark of the trees in some cases show characteristic peeling, furrowing, etc. Resins of characteristic pigmentation which appear on wounding the boles is another phenomenon in some members of the tier. Buttressing is common in trees like *Hydnocarpus pentandrus*, *H. alpina*, *Fagraea ceilanica* and *Knema attenuata* growing in this layer. Cauliflory is also exhibited by certain members of the tier. Trees like *Canarium strictum*, *Diospyros ebenum* and *Schleichera oleosa* change the colour of their leaves and this one can observe from a distance in the top layer of the shola here. Some of the more characteristic trees forming this tier are *Canarium strictum*, *Diospyros ebenum*, *Mesua nagassarum* var. *coromandelina*, *Knema attenuata*, *Schleichera oleosa*, *Neolitsea zeylanica*, *Symplocos macrocarpa*, *Pterocarpus marsupium* and species of *Terminalia*. Ecologically the trees of the top canopy are quite significant as it profoundly influence the undergrowth there.

Epiphytes and woody climbers are common in the tier. Orchids with water storing leaves or velamen-covered roots are found commonly on the shola trees. Typical examples of such species found in Courtallum shola are *Vanda tessellata* and *Dendrobium macrostachyum* in the humus or deteriorating bark of trees forming the crown canopy. Epiphytic ferns like *Drynaria quercifolia* and *Pyrrosia adnascens* are more frequent than the orchids and they are hygrophilous or xerophilous on these tree trunks. Mosses frequently growing on the tall trees of this tier serve as the water retaining substratum giving abode to epiphytes like *Aeschynanthes perrottetii* with fleshy leaves and solitary, large flowers. Certain epiphytes of the tier descend to the wet forest floor and grow along the sides of the rocks and on buttressed roots of trees. *Impatiens auriculata* is typical of the type recorded in the sholas of Courtallum.

Climbers like *Entada pursaetha*, *Salacia oblonga*, and species of *Cissus* grow along the sides of the ravines reaching the top of the emergent layer, whereas those plants like *Thunbergia fragrans*, *Breynia* sp., *Dioscorea* sp., *Leea indica*, *Mussaenda glabrata*, *M. laxa*, species of *Jasminum*, etc., are much stunted reaching lesser dimensions. Most of these small climbers grow in places where there are openings in the upper canopy. Parasitic species are almost completely absent in the top layer.

Subcanopy or lower storey

The layer is exclusively formed of stunted trees and large shrubs which adapt themselves to shady situations. Their general appearance is not with a rounded top as in the case of the top layer, but are often candle-shaped with a dark green foliage. The trees here have slender stems with branches often bent variously seeking sunlight. Long cleanboled plants are not found in this layer and those branches of the trees here are much slender. Woody shrubs reaching fair dimensions are more common in the subcanopy, so also epiphytic mosses, ferns and orchids. Species like *Pterospermum xylocarpum*, *Symplocos rosea*, *Ervatamia heyneana*, *Cinnamomum verum*, *C. macrocarpum*, *Neolitsea cassia*, *Meliosma simplicifolia*, *Chionanthus leprocarpa* var. *courtallensis*, *Vitex altissima*, *V. negundo*, *Sarcococca pruniformis*, *Xanthophyllum flavescens*, *Goniothalamus wightii* and *Gomphandra tetrandra* with graceful spreading branches are common in the subcanopy of the sholas of Vaithamalai and Tekkumalai. Some of the large shrubs adding to the formation of the storey are species of *Psychotria*, *Lasianthus blumeanus*, *Glycosmis angustifolia*, *Canthium parviflorum*, *Ixora lanceolaria*, *Alstonia venenata*, *Thunbergia erecta* and the very characteristic *Agrostistachys indica* and *A. meeboldii* with the large deep green, coriaceous leaves. In Tekkumalai and occasionally on the way to Vaithamalai, species of *Calamus* are found in the shola where shading is maximum. In certain places, less characteristic species occupying an intermediate position between the subcanopy and the ground flora are quite

common and species of *Lobelia*, *Psychotria*, *Glycosmis*, *Solanum*, *Ecbolium*, *Nilgiranthus*, etc., all contribute to the formation of such a layer. Species as mentioned above are more common where there are small openings in the top canopy or along the sides of the streams traversing the forest type. They possess deep green foliage and often carry remnants of decaying leaves on their branches and foliage, fallen from the top canopy. It is on these plants that climbers like *Rubia cordifolia*, *Thunbergia fragrans*, etc., find support. Apart from this, along the sides of the streams and ravines are found several stragglers and climbers like *Heptapleurum venulosum*, *Salacia oblonga*, species of *Anamirta*, *Tiliacora*, *Hiptage*, *Ampelocissus*, *Cissus* and *Securinega*, some of which reach the upper growth layer in favourable situation.

In the subcanopy layer where direct sunlight seldom penetrates, several epiphytic mosses, ferns, etc., grow. Few flowering plants may be seen on trees trunks, ie. *Luisia teretifolia*, *Aeschynanthes perrottetii* and *Impatiens auriculata* which even though rare are curious humid loving plants on the subcanopy trees of Tekkumalai shola. *Heptapleurum venulosum* which is terrestrial along the sides of the streams in the lower altitudes of Tekkumalai is epiphytic in the subcanopy layer of the shola at higher elevations, an interesting feature of coexistence and adaptation in a typical humid tropic forest of different tiers.

Undergrowth or ground flora

In true wet evergreen rain forests ground flora is comparatively poor and Courtallum is not an exception to it. Only some of those more shade-loving species and ground orchids are the only characteristic plants of the tier, but often several of the balsams, aroids, amaryllids and ferns, some of which possess a bulbous or fleshy stem also find their suitable habitat here. Quite a few culms of grasses grow in some of the depressions or ridges of the forest floor here and there like those formed by *Cenotheca latifolia* and *Brachiaria ramosa*, but they never form an extended grass-land in any part of the shola. Curious ground orchids like *Habenaria crinifera*, *Disperis zeylanica* and *Zeuxine longilabris* is rarely found in the shady, more humid situations of the sholas of Tekkumalai. During monsoon a variety of balsams sprout from the wet soil namely *Impatiens flaccida*, *I. grandis*, *I. acaulis* and *I. dasysperma*. Other more common herbs in the forest floor of the shola are *Begonia malabarica*, *Ophiorrhiza mungos*, *Dorstenia indica*, *Elatostemma lineolatum*, *Pellionia heyneana*, *Laportea interrupta*, *Crinum latifolium*, *Lepanthes umbellata* etc. most of which possess a fleshy stem. Wherever small streams or brooklets are formed during monsoon, species like *Oxalis corymbosa*, *O. corniculata*, *Hydrocotyle javanica*, etc. grow in the marshy soil along the borders of it. *Apama siliquosa*, *Pouzolzia wightii*, *Canna orientalis*, *Elettaria cardamomum*, *Alpinia malaccense* and *Costus speciosus* are also

seen in the shola forest floor. Several ferns flourish in the humus soil along the sides of the stream and damp forest floor in both Tekkumalai and Vaithamalai sholas like *Arachnoides aristata*, *Asplenium formosum*, *A. aethiopicum*, *Dryopteris concolor*, etc., some of which acquire enormous sizes. Except for those species mentioned above and those which are less characteristic for the area, the forest floor here is covered with fallen leaves and twigs from the canopies above.

The tropical wet evergreen forests are accepted as the climax type of vegetation in humid tropics where annual rainfall exceeds 250 cm and the dry season is not much prolonged. Truly the climax type of vegetation is a representative of the climatic features of the region. Abundant water supply due to the prevalence of two distinct monsoons, high temperature with little variations, a short dry season and practically no cold season characterise the montane climate of Courtallum which has given rise to this luxuriant type of vegetation. Apart from this, biotic interferences, soil factors and the general physiographic nature of the area all contribute to the formation of shola and its distribution.

As to the changes induced in the shola forests by monsoon, there is nothing much characteristic except for the sprouting of ground annuals like species of *Impatiens*, *Habenaria*, *Zeuxine*, *Disperis*, *Alpinia*, etc. In general the upper canopy remains more or less the same, excepting the epiphytes on tree trunks. Due to the prevalence of high relative humidity and excess of moisture, the fallen leaves accumulated in the forest floor become decomposed in which rich fungal growth and several other microflora and microfauna abound during this season.

Southern moist deciduous forests

This is a more or less closed type of forest, about 20 metres high in which the dominant species are deciduous at least in the some part of the year. In Courtallum the forest type is best developed in areas roughly falling within a height of 500 to 900 metres with an annual rainfall ranging from 240 to 350 cm. Temperature is almost the same as in the case of shola areas and the soil type varies from loamy to laterite type or metamorphic rocks like schists, gneiss or granite. The damp valleys and mountainous tracts coming within the range of altitude and rainfall around Shembagadevi and the mountain slopes on the way to Five falls and Old Courtallum have this forest type. A dry season of 4 to 5 months in almost every year is a rule in such areas and the dominant species remain leafless during this period. In areas where soil moisture is high evergreen elements of the higher altitudes may descend to this zone and several species of the lower bordering vegetation are also found in this region.

Most of the species constituting the forest type are pronounced light-demanders. Trees here possess a rounded crown. Buttressing is not

prevalent except in a few trees. Climbers are fairly common, so also epiphytes wherever shady moist situations prevail. Undergrowth is thick and evergreen. The different growth-tiers are less defined than that of the evergreen forest type as there is a regular competition in growth among the various plants forming the forest type.

Ecodominant layer or top layer

The trees which constitute this stratum are 10 to 25 metres in height. They have their crowns overlapping in dense areas, but not so close as in the case of the crown canopy in the wet evergreen forest type. The trees are less branched here and buttressing is very rare. Those common trees forming the layer are *Tectona grandis*, *Dalbergia lanceolaria*, *Sterculia guttata*, *Dalbergia sissoides*, *Pterocarpus marsupium*, *Anogeissus latifolia*, *Careya arborea*, *Terminalia bellerica*, *Mitragyna parviflora*, *Pterospermum personatum*, *Cassia fistula*, *Pongamia pinnata*, *Schleichera oleosa*, *Gardenia resinifera*, *Chionanthus linocieroides*, *Grewia tiliacifolia* and *Lepisanthes deficiens*, most of which are economically important timber trees. Several of these trees grow in the lower altitudes and form a part of the vegetation there where they have stunted growth. Another striking species in the forest type is *Bambusa arundinacea* in several pockets on the way to Tekkumalai. Thus Bamboo-mixed type of wet deciduous forests are seen in Courtallum.

Understorey or subcanopy

Those evergreen shrubs and small trees constituting the tier form a major part of the vegetation in moist deciduous forests. Often it attains a height of 4 to 6 metres and on these trees are found several climbers and stragglers. Occasional openings are found in this layer due to forest clearing or because of the presence of rocky substratum in the forest floor where practically mesophytes are quite few. The floristic composition of the layer is highly complex and small trees like *Erythroxylum monogynum*, *Grewia tiliacifolia*, *Ziziphus xylopyrus*, *Mallotus philippensis*, *Bauhinia racemosa*, *Cipadessa baccifera*, *Ixora arborea*, *I. nigricans*, *Polyalthia cerasoides*, *Clausena dentata*, *Nothaphodytes foetida*, *Phyllanthus emblica*, *Murraya paniculata*, *Aglaia elaeagnoides* var. *courtallensis*, *Microcos paniculata* and species of *Capparis* are common in this tier. Added to this are several shrubs like *Ixora lanceolaria*, *Pavetta indica*, *Randia malabarica*, *Helicteres isora*, *Blachia calycina*, *Tarenna asiatica*, *Memecylon umbellatum*, *Capparis zeylanica*, *Cassia hirsuta*, *Canthium parviflorum*, *Canthium angustifolium*, and several species of *Psychotria*. Often along the water courses here are found several isolated groups of *Pandanus fascicularis* Lamk. Wherever there are temporary openings due to felling or uncontrolled hacking, thicket formations of a secondary type are also common.

Climbers and stragglers are rather numerous in the moist deciduous forests of Courtallum. Leaving the outskirts, this is the major type of vegetation that supports climbing plants. Along the sides of the ravines bordering the stream are climbers like *Acacia torta*, which becomes often gregarious affecting the natural growth of several of the shrubs and trees. Other climbers and scandents include *Gouania microcarpa*, *Bridelia stipularis*, *Pisonia aciculata*, *Olax scandens*, *Hugonia mystax*, *Salacia oblonga*, *Pithecellobium dulce*, *Derris scandens*, *Ichnocarpus frutescens*, *Cansjeera rheedii*, *Ziziphus oenoplia*, *Combretum ovalifolium*, *Erythrophalum populifolium*, *Anamirta cocculus*, etc., most of which are woody in nature. Less gregarious and more herbaceous in nature are species like *Ampelocissus arnottiana*, *Cayratia pedata*, *Cyclea peltata*, *Cissampelos pareira*, *Trichosanthes nervifolia*, *Passiflora foetida*, *Pachygone ovata*, several species of *Jasminum*, *Dioscorea*, *Ceropegia*, *Tylophora*, *Wattakaka*, *Desmodium*, etc. which spread on the bushes in the exposed areas. The suberect forms of *Nilgiranthus* and *Opelia amentacea* are other plants commonly found along the side of the ravines within the forest type.

Ground layer

Those plants constituting ground layer in the moist deciduous forests of Courtallum are mostly confined to the damp pockets and shady tracts there. As the area covered by the forest type is traversed by several small rivulets and streams, most of these species are confined to their banks, often showing a tendency to become hydrophytic and such plants are grouped under a different head. Plants like *Chlorophytum heynei*, *Elytraria acaulis* and *Curculigo orchoides* sprouting from the forest floor in more drier and loamy areas with underground stem and cauline leaves are common. Other common plants in the forest floor here are *Elephantopus scaber*, *Emilia sonchifolia*, *Didymocarpus innominatus*, *Begonia malabarica*, *Ophiorrhiza mungos*, *Gynura lycopersaeifolia*, *G. nitida*, *Crassocephalum crepidioides*, *Polygala javana*, *Abelmoschus monschatus*, *Hibiscus lobatus*, *Pavonia odorata*, *Acalypha paniculata*, *Psilotrichum calceolatum*, species of *Vernonia*, *Cleome*, *Sida*, *Phyllanthus*, etc. Scattered in the rocky localities are large culms of *Aristida funiculata*, *Cymbopogon coloratus*, *C. gidarba*, *Themeda triandra*, *Eragrostis gangetica*, and *Chloris dolichostachya* forming tufts in the crevices of rocks in open areas. In more moist situations *Piper trioticum* is gregarious on rocks completely covering it. *Peperomia dindigulensis* and *Didymocarpus innominatus* also find their foothold in the humus accumulated in the crevices of wet rocks of wet deciduous forest floor.

Southern dry deciduous forests

The forest type occurs in the outer slopes of Courtallum hills where rainfall is much less when compared to the moist deciduous forest areas. Often the precipitation in these areas vary from 100 to 130 cm per annum.

Mallotus stenanthus, *Grewia bracteata*, *Erythroxylum monogynum*, *Blachia calycina*, *Tarenna asiatica*, *Capparis grandis*, *Murraya paniculata*, *Canthium parviflorum*, *Xeromphis spinosa*, *Helicteres isora*, *Gmelina asiatica*, *Stachytarpheta indica*, *Vitex negundo*, *Flacourtia indica*, *Carmona microphylla* and *Cadaba trifoliata* are some of the more characteristic plants forming the layer. Many of these species found in the layer are armed. Following climbers or stragglers with tendrils, hooks or spines are also abundant in the tier. *Maerua arenaria*, *Hugonia myrtax*, *Celastrus paniculata*, *Maytenus wallichii*, *Toddalia asiatica*, *Ziziphus rugosa*, *Reissantia indica*, *Cissus quadrangularis*, *Cayratia pedata*, *Canavalia gladiata*, *Plumbago zeylanica*, *Abrus precatorius*, *Derris scandens*, *Scutia circumscissa*, *Tylophora subramanii*, *Bridelia stipularis*, *B. scandens*, *Asparagus racemosus*, *Smilax zeylanica*, *Gymnema sylvestre* and *Securinega leucopyrus*, most of which are woody lianas. More herbaceous and rather rare in their distribution are *Clitoria ternatea*, *Ceropegia elegans*, etc., which dry out in summer.

Undergrowth

Undergrowth in dry deciduous forests consists of few erect or suberect herbs and undershrubs, capable of surviving in dry soil there. Plants like *Cadaba trifoliata*, *Vernonia cinerea*, *V. setigera*, *Blepharisperмум petiolare*, *Eupatorium adenophorum*, *Tridax procumbens*, *Dodonaea viscosa*, *Spermacoce articularis*, *Rostellularia diffusa*, *Anisochilus carnosus*, *Anisomeles malabarica*, *Endostemon viscosus*, species of *Sida*, *Urena*, *Tephrosia*, *Orthosiphon*, *Abutilon*, etc. are common in the rocky forest floor of the dry deciduous areas of Courtallum. Grasses like *Cymbopogon glomeratus*, *Themeda triandra*, *Chloris dolichostachya*, *Aristida funiculata*, *Brachiaria ramosa*, *Cymbopogon caesius*, *Eragrostiella bifaria*, *Iseilema laxum*, and *Heteropogon contortus*, form tufts in the open forest floor and along the sides of rocks within the forest type.

As the forest type is seen in the outskirts of the reserve forests of Courtallum, several exotic species are found there. They include weeds like *Gomphrena celosoides*, *Conyza leucantha*, *Hyptis suaveolens*, *Euphorbia geniculata*, *Acanthospermum hispidum*. Species of *Spermacoce*, *Cleome*, *Digitaria*, *Croton*, *Eupatorium*, *Jatropha*, *Pupalia*, etc., are found in places where human interference on the vegetation is more.

Southern thorn forests

This forest type occupies the dry rocky areas in the inclines of hills and undulating borders of the forest where rainfall is much less. The only little precipitation for the area is received during the South-West monsoon. During rest of the year the area remains practically dry. Added to this, lack of a thick vegetational cover and presence of rocky soil substratum make the situation unsuitable for normal plant growth.

The soil varies from rocky to sandy and laterite types characteristic of the low undulating dry hills. Drainage is quick and within a few days after the ceasing of rainfall the soil becomes dry. During dry season there is practically no precipitation in these areas. Rocky outcrops are very common with the characteristic xerophytic species around them.

In the outskirts of the forests between Main falls and Tiger falls and along the hill slopes on the way to Old Courtallum this forest type is seen. These areas are practically in the rain-shadow portions of Courtallum Ghats. As the forest type mostly occurs in the foot hills where South west monsoon is not available, most of the precipitation is during October to January, leaving the remaining part of the year practically dry. The trees are stunted in growth due to poor soil, rocky substratum, lack of soil moisture and scorching heat. Bordering the moist deciduous area along the upper portion of the dry deciduous forest, there are tufts of lemon grasses of which *Cymbopogon coloratus* is a more common one. Trees are scattered in these areas and they gradually merge with those of the moist deciduous type above. Wherever there are moist situations, evergreen species like *Santalum album*, *Mallotus philippensis*, etc. are seen.

The vegetation of the area covered by the forest type is rather scattered. Few dominant tree species seldom reaching 8 to 12 metres in height with a shrubby interspace is a common sight here. *Borassus flabellifer* which is a common palm in the plains of Courtallum is often seen along these outskirts. Thorny plants are abundant, so also climbers and semi-parasitic species like *Viscum* sp., *Dendrophthoe falcata*, *Macrosolen parasitica*, *Helixanthera hookeriana*, etc. Roughly following tiers are recognised in the general stand of the forest type in Courtallum.

Crown canopy

The tall trees found in this forest type hardly attain a height of 10 to 12 metres in general. The plants forming the tier are somewhat scattered in the area and hence there is no overlapping of crowns. Most of these trees are deciduous. Some of the common species forming the tier are *Tectona grandis*, *Pterocarpus marsupium*, *Anogeissus latifolia*, *Cassia fistula*, *Grewia tiliaefolia*, *Terminalia paniculata*, *T. gella*, *Careya arborea*, *Dalbergia lanceolaria*, *D. sissooides*, *Albizia lebbek*, *Buchanania lanzan*, *Dolichandrone atrovirens*, *Strychnos potatorum*, *Ziziphus xylopyrus*, *Lannea coromandeliana*, *Anacardium occidentale*, *Phyllanthus emblica*, *Celtis cinnamomea* and *Gardenia resinifera*. Along the sides of the streamlets traversing this forest type there are stands of *Syzygium cumini* almost evergreen throughout the year.

Subcanopy

The plants forming the tier are shrubs, stragglers and climbers. Species like *Capparis divaricata*, *Grewia orientalis*, *Memecylon umbellata*,

Dichotomous keys are provided to the families, genera and species mainly based on exomorphic characters to facilitate easy identification of plants reported in this work. Genera within families and species within genera follow alphabetical sequence in their arrangement.

In the nomenclature of plants, what has been considered as the correct name as per the '*International Code of Botanical Nomenclature*' (1983) is given first ; this is followed by the basionym, if any, and some of the common synonyms pertaining to *Flora of British India*, *Flora of the Presidency of Madras*, representative *Icones*, *monographs* and *revisions*. The short descriptions of species and infraspecific taxa that follows are primarily based on materials of the present collections and those made by earlier workers from Courtallum. Field notes, flowering and fruiting period and local names in Malayalam and Tamil languages are also provided with taxonomic notes wherever essential.

The following abbreviations are used to indicate the herbaria from which specimens are cited in the Flora.

CAL Central National Herbarium, Botanical Survey of India, Indian Botanic Garden, Howrah-711103, India.

MH Herbarium of the Southern Circle, Botanical Survey of India, Coimbatore-641002, India.

PCM Herbarium, Department of Botany, Presidency College, Madras-600005, India.

LE - Herbarium of the Komarov Botanical Institute, Academy of Sciences of the U.S.S.R., Leningrad.

The rocky outskirts of the reserve forests beyond Old Courtallum and the Rockhill area above Tiger falls possess a thorny open forest classifiable into this type. The general stand is scattered and most of the species are woody and armed. The trees are much stunted and hardly reaches 4 to 5 metres in height. *Capparis divaricata*, *Ficus hispida*, *F. retusa*, *Randia cochinchinensis*, *Dichrostachys cinerea*, *Prosopis cineraria*, *Acacia ferruginea*, *Gardenia resinifera*, *Euphorbia nivulia*, *Erythroxylum monogynum*, *Dodonea viscosa* and *Gmelina arborea* are some of the more common plants of the area. Few stands of *Borassus flabellifer* is common in the forest type at Old Courtallum, but it is totally absent from the Rockhill area where several species of *Ficus* is seen along with *Euphorbia antiquorum* along the sides of rocks. There are groups of *Calotropis gigantea* plants grow in the patches of the soil in between rocks on the way to Old Courtallum. Rarely, climbers like *Sarcostemma acidum*, *Wattakoka volubilis* and *Secamone emetica* are seen on *Euphorbia antiquorum* plants. At Old Courtallum, grasses like *Aristida funiculata*, *A. setosa*, *Heteropogon contortus*, *Perotis indica* and species of *Eragrostis* and *Cymbopogon* grow in the soil around rocks. Typically *Polycarpaea corymbosa*, *Drymaria cordata*, *Indigofera linnaei*, *I. aspalathoides*, *Euphorbia rosea* and species of *Crotalaria* are seen in the rocky soil of the forest type above Tiger Falls. During monsoon the soil here becomes wet when species like *Osbeckia truncata* grow abundantly.

Hydrophytes

Hydrophytes at Courtallum are seasonal and are distributed along the banks of mountain rivers, their tributaries, marshes, ditches, ponds and similar other wet localities like the wet surroundings of waterfalls and cascades. They flourish during monsoon, and a statistical analysis of the flowering periods of various hydrophytic species of the area showed that a maximum number of them flower and fruit during November. However, in April it is the minimum. Nair (1980) had given a detailed account of the habitats, relative distribution and phenology of this group of plants at Courtallum.

Habitat and distribution

Streams and their banks

Hydrophytes confined to this habitat are mostly those species growing along the banks of those mountain streams traversing the area. Towards the centre of the streams, as there is constant water current, practically no hydrophyte can flourish except for those free-floating algae, and species like *Polypleurum stylosum* which has its roots in the underlying or bordering rock.

In Tekkumalai, along the banks of the river Chittar, few aquatic and semiaquatic plants grow. This reduction in the hydrophytic flora is due to the fact that the edge of the streams here is steep leaving little base for foot-hold for the plants. Swampy or marshy conditions do not exist. Rarely sandbanks are formed here and there but with a poor vegetation, that too mainly mesophytic. It is in the course of the stream here that *Polypleurum stylosum* grows with its thalloid body attached to the underlying rocks by means of hairs or 'heptera' thus preventing it from being washed away in the current. Along the sides of the stream there are species like *Commelina ensifolia*, *C. paludosa*, *Bergia ammanoides*, few algae and bryophytes. During monsoon, in several of the canals and marshy spots formed in Tekkumalai, plants like *Oxalis corymbosa*, *Blrophytum intermedium*, *Hydrocotyle javanica*, *Eragrostis gangetica*, *Paspalum conjugatum*, etc. which are otherwise truly mesophytic grow in semi-hydrophytic conditions.

Along the banks of the river Chittar from Shembagadevi at about 2 kilometres from the foot hills to the Main falls in the vicinity of Courtallum township, a luxuriant growth of aquatic plants occur, as the stream here is shallow and slow-flowing and the banks possess several marshes, puddles and stagnant patches. During monsoon when the stream is full, most of the wet-land species disappear, but as the water level descends, the wet banks and marshes left behind form the natural abode for such plants. Some of the species rather confined to this region are *Drosera burmanii*, *Xyris pauciflora*, *Cardamine hirsuta*, *Anellema montanum*, *Murdannia loriformis*, *Ludwigia petennis*, *Eriocaulon* sp., *Echinochloa colonum*, *Lindernia ciliata*, *Utricularia graminifolia*, *Didymocarpus innominatus*, etc. of which the last mentioned plant is truly mesophytic in its natural habitat. In the stagnated pockets of the stream occur floating plants like *Ludwigia perennis* with floating roots and *Utricularia* sp. with filiform stem and roots and upright scapes bearing rose coloured flowers. Above Main falls, as the stream slows down, a marsh or puddle system is formed during the summer, where species like *Canscora heteroclita*, *Hoppea fastigiata*, *Xyris pauciflora*, *Elatine triandra*, *Amischophacelus axillaris*, *Murdannia dimorpha*, *Bacopa monnieri*, *Lindernia crustacea*, *Torenia travancorica*, *Alternanthera sessilis*, etc. grow. The most characteristic species of this community is *Canscora heteroclita*, forming elegant stands with green, winged stems and pink flowers. Emergent amphibian hydrophytes like *Limnophila heterophylla* exhibiting heterophylly is common. Several sedges and grasses form the borderline species to those truly aquatic plants here. Below the falls along the sides of the pond in front of Courtallum temple, grow a few aquatics like *Lindernia pusilla*, in summer when it is dry. Species like *Hydrolea zeylanica*, *Sporobolus diander*, *Mariscus compactus*,

M. paniceus, etc. occupy the sides of the stream on wet ground along with a more characteristic species *Ipomoea pescaprae*.

During monsoon when the soil between the rocks above Chittaruvi become marshy, *Sopubia delphinifolia* with its characteristic green fleshy stem, filiform leaves and prominent rose coloured flowers become gregarious. Unlike several other aquatic species, the plants are erect rooting only at the base. Fleshy plants with spreading branches and rooting at the lower nodes like *Commelina ensifolia*, *Cyanotis cristata* *Bacopa monnieri*, *Lindernia antipoda*, & *Lindernia crustacea*, form a community in this area during rainy season, but in the remaining part of the year they are mesophytic. Except for the few species mentioned, Chittaruvi area is poor in hydrophytes as also is the Tiger falls area about 200 metres east of Courtallum township, where, in the course of the stream temporary sand beds are formed bordering few semi-aquatic plants like *Polygonum glabrum* and *Utricularia polygonoides* along the banks of the stream. During summer the stream dries, leaving practically no trace of the more hydrophilous plants excepting *Polygonum glabrum*.

At New falls the aquatic vegetation is more characteristic. As the streamlets descend in several steps on the face of the rock with pockets of marshy soil deposited here and there, several aquatic plants like *Eriocaulon quinquangulare* and *Utricularia graminifolia* grow. *Utricularia striatula* grow abundantly carpeting the wet faces of the rock in large patches. Below the falls, in the stagnant water and marshy soil between rocks *Ludwigia octovalvis* subsp. *sessiliflora* form large clumps with a highly spreading root system. *Cyperus tenuispica* is yet another common wet-land species of the area. The stream is perennial and the aquatic vegetation here flourish in the post monsoon period also.

In the stagnant areas below the reserve forest boundary on the way to Old Courtallum, species like *Polygonum glabrum* grow in truly aquatic conditions with the vegetative portions almost completely immersed in water, that is an anchored submerged hydrophyte, with the inflorescence emerging above the water level. In the forests around Old Courtallum with several rivulets of the Palayakutalam Aruvi there are plants like *Pouzolzia pentandra*, *Bergia ammanoides* and *Cyperus pilosus*, in semi-aquatic conditions. Aquatic vegetation of this region is quite scanty when compared to that found in other parts of Courtallum.

Along the banks of the river Aindalai Aruvi at Five falls and above it, and especially around Swamiar falls in Udayathan estate above, several hydrophytes grow. Eventhough the stream here is almost perennial, its flow is considerably reduced during summer. The most characteristic

growth of this locality is found at Swamiar falls, where the cascading water moistens the surrounding area. A very characteristic species found here is *Epithema carnosum* which grows only in the ecological niches around mountain streams where such humid conditions exist. The plant is quite curious for its mostly singular large leaves and bluish inflorescence and grows along both sides of the mouth of the falls in the humus soil accumulated in the crevices of the rocks, moistened by the spray from the falls. Surrounding the falls, in the wet soil are plants like *Anellema montanum*, *Commelina benghalensis*, *Murdannia zeylanica* var. *longicapsa*, *Cyperus castaneus*, *C. iria*, *Fimbristylis ovata*, *Paspalidium flavidum*, *Lindernia ciliata*, *L. antipoda*, *L. crustacea* and *Eragrostis tenella* which grows as a tufted semiaquatic plant at Swamiar falls is purely mesophytic in dry habitats on the way to Tekkumalai. Similar is the case of *Paspalidium flavidum* which is also found here. The rocks bordering Swamiar falls are carpeted by thalloid bryophytes which grow throughout the course of the stream on exposed wet rock surfaces. Below Swamiar falls along the sandbanks formed by the stream here and there, grows *Isachne dispar*, *Fimbristylis bisumbellata* and *Eragrostis gangetica* which are adapted to semiaquatic conditions though they are mesophytic in several other parts of Courtallum.

Ponds

Many ponds in Courtallum mostly dry up during summer.

Thippakkulam, the pond in front of Chitrasabhai in the close vicinity of Courtallum temple has been abandoned at present but was once well-maintained and considered to be of religious significance and has a 'gopuram' in its centre surrounded by water. The pond is being reclaimed by dumping wastes and crumbling of side walls and in summer it is almost dry with a marshy bottom. *Pistia stratiotes* which is a stoloniferous floating herb when the pond is full, gradually descend to the bottom as it dries up and grow gregariously in the marshy soil there. Here and there, groups of *Polygonum glabrum* plants are also common in the marshy bottom of the pond. Other more frequent aquatics here are *Bacopa monnieri*, *Ammania baccifera*, *Boerhavia diffusa* and the heterophyllous, amphibious, hydrophyte *Limnophylla heterophylla*.

In the outskirts of the forests on the way to Five falls is the pond 'Thamarakulam' which dries up in summer leaving only a marshy bed. The gently sloping marginal zone of this pond remains wet in summer bears wet-land species like *Commelina ensifolia*, *Fimbristylis bisumbellata*, *Pycreus globosus*, *Dactyloctenium aegyptium*, *Eriochloa procera*, *Dopatrium junceum*, *Lindernia antipoda*. The shallow middle zone of the pond which is filled with water during the rainy season forms the habitat for plants

like *Nymphaea pubescens* which are anchored in the bottom of the pond with floating leaves and long pedicelled flowers slightly raised above the water level. Floating or rooted aquatics like *Myriophyllum oliganthum* with submerged leaves, *Hydrilla verticillata* with stoloniferous floating plant body and *Aponogeton natans* with floating leaves and stoloniferous rootstock become gregarious when the pond is filled. As the water descend, these plants gradually become exposed in the marshy soil where species like *Aeschynomene indica*, *Pycnus globosus* also spread.

Ditches, puddles, canals, etc.

The wet-soil plants growing in several of the moist habitats in the area are grouped under this head and it includes most of the amphibian and less characteristic species of the group. There are a number of shallow bodies of water distributed mostly towards the western part of the area along the outskirts of the forests on the way to Five falls which include small canals, gutters, damp fields, small ditches, etc. In such habitats herbs like *Pedaliu murex*, *Amischophacelus axillaris*, *Commelina ensifolia*, *Cyperus tenuispica*, *Fimbristylis bisumbellata*, *Dactyloctenium aegyptium*, *Eriochloa procera*, *Setaria palmifolia*, *Dopatrium junceum*, *Lindernia ciliata*, etc. grow. In the wet soil around the water tank above Courtallum township *Ipomoea pescaprae* is a rather common species.

Although not strictly hydrophytic, the flora surrounding cascades and waterfalls as included in this group deserves special mention. The name 'water mountain plants' is proposed for the group by van Steenis (1965) and such plants find their natural habitat near waterfalls which has got a 'cool micro-climate' around it. The swiftly drifting flow usually keeps away from the rock surface for about 0.5 to 2 metres when it reaches the bottom, and the gap thus formed is peculiarly conditioned to lodge certain plants like *Utricularia striatula*, *Epithema carnosum*, species of *Impatiens*. Due to the continuous spray of water from the falls, the rock surface is always wet and thus the vegetation on its face is distinctly zoned according to the availability of water. The species which grow in such habitats, complete their life-cycle within a month or two after the second monsoon, as the climate here gradually becomes more drier.

Rheophytes

The plants belonging to this group are found in rocky, gravelly and sandy soil where overflow of water is frequent. Such plants termed as rheophytes by van Steenis (1965) are quite few in Courtallum and are confined to the banks of streams and rivulets in the ghat region. The gravelly stream banks which harbour this type of vegetation is less prevalent in Courtallum but for small deltas formed here and there where quite a few

rheophytes grow. Below Honey falls few such plants recorded are *Cleome monophylla*, *C. viscosa*, *Cardamine hirsuta*, *Polygala javana*, etc. But this habitat is not very typical of the type as it is very close to the flowing water, making it more hydrophytic or mesophytic than truly rheophytic. Similar is the case of those species found along the deltas and sandy soil below Shembagadevi falls, around Main falls and below Tiger falls which can hardly be grouped under the vegetational type. In the dry rocky soil below Tiger falls and Old Courtallum falls are found plants like *Dichrostachys cinerea* along the sides of the stream in truly rheophytic conditions and some of the grasses and sedges found in the area add to this.

In the Rockhill area, along the sides of the rivulet from Shembagadevi to Tiger falls are several rheophytes growing in the crevices of rocks and small patches of soil in between them. Species like *Polycarpaea corymbosa*, *Drymaria cordata*, *Atylosia albicans*, *Indigofera linnaei*, *Spermacoce articulata*, *S. ocymoides*, *Hedyotis nitida*, *H. umbellata*, *Acanthospermum hispidum* and species of *Rostellularia* are representative of the type of the vegetation here. Grasses like *Cymbopogon gidarba*, *Aristida setosa*, *Chloris dolichostachya*, *Digitaria adscendens*, *Heteropogon contortus*, *Perotis indica* and species of *Eragrostis* also add to the formation here.

At Honey falls and New falls are several rheophytic plants like *Phyllanthus urinaria* and *P. virgatus* rooted in the crevices of the bordering rocks and hanging into the mouth of the falls. In the rocky and gravelly open forest areas around Shembagadevi are found species like *Carex filicina*, *Curculigo archioides*, *Scleria lithosperma*, *Cyperus iria*, *Mariscus* sp., *Cyanotis villosa*, species of *Chlorophytum*, *Gomphrena*, *Amaranthus*, *Psilotrichum*, *Polygala*, *Ficus*, etc. sprouting and growing rheophytically.

On the way to Old Courtallum the open outskirts of the forests with several rivulets here and there, harbour few rheophytes. *Prosopis cineraria*, *Acacia ferruginea* and few grasses like *Heteropogon contortus*, *Perotis indica* and *Aristida funiculata* even though less characteristic for the vegetation are examples of the group in such localities. Beyond Old Courtallum along the banks of the dried stream plants like *Acacia ferruginea*, *Prosopis cineraria*, etc. grow.

Along the sides of the stream in Tekkumalai and above Five falls are few species of grasses, sedges and ferns like *Pyrrosia adnascens*, *Asplenium falcatum*, etc. grow in the crevices of rocks and sandy soil deposited on it. A common grass of this type is *Centotheca latifolia* forming large tufts here and there on rock where sandy soil is deposited.

STATISTICAL SYNOPSIS

During the present study a total of 745 taxa of flowering plants, both indigenous and naturalized were recorded from Courtallum. This when compared to the total 4, 516 and 2,105 species for the former Madras Presidency and Tirunelveli district respectively (Mudaliar and Sunderaraj, 1954) is a good number. Of this 616 taxa are dicotyledones belonging to 372 genera and 107 families. The remaining 129 species are monocotyledones coming under 82 genera and 24 families. Within the dicotyledones 260 taxa belongs to Polypetalae, 237 to Gamopetalae and 119 to Apetalae. The total number of varieties recorded in the flora is 19, ie., 17 dicotyledones and 2 monocotyledones. The data are tabulated in Table I.

Table I

Group	No. of families	No. of genera	No. of species	No. of varieties
Polypetalae	58	167	251	9
Gamopetalae	30	146	229	8
Apetalae	19	69	119	0
Monocotyledones	24	82	127	2

As mentioned earlier, the total of 745 taxa recorded from Courtallum belong to 131 families. But out of the 131 families recorded from Courtallum, 48 contain only one genus each and another 28 not more than two. Within the families comprising of single genus, the following are represented by a single species each. *Ranunculaceae*, *Nymphaeaceae*, *Cruciferae*, *Portulacaceae*, *Theaceae*, *Ancistrocladaceae*, *Linaceae*, *Erythroxylaceae*, *Leeaceae*, *Sabiaceae*, *Crassulaceae*, *Droseraceae*, *Haloragaceae*, *Myrtaceae*, *Lecythidaceae*, *Molluginaceae*, *Alangiaceae*, *Plumbagineaceae*, *Myrsinaceae*, *Chloranthaceae*, *Myristicaceae*, *Santalaceae*, *Bischofiaceae*, *Stilaginaceae*, *Buxaceae*, *Hydrocharitaceae*, *Costaceae*, *Marantaceae*, *Cannaceae*, *Amaryllidaceae*, *Trichopodaceae*, *Asparagaceae*, *Smilacaceae*, *Hypoxidaceae*, *Xyridaceae*, *Pandanaceae*, *Aponogetonaceae* and *Bambusaceae*.

Those 10 dominant families in the flora with regard to the number of species under each are *Gramineae*, *Papilionaceae*, *Euphorbiaceae*, *Rubiaceae*, *Acanthaceae*, *Compositae*, *Cyperaceae*, *Convolvulaceae*, *Labiatae* and *Scrophulariaceae*. Table II gives the number of taxa under each and their percentage in the total number of species in the flora.

Table II

Family	No. of taxa	Percentage of the total
<i>Gramineae</i>	54	7.25
<i>Papilionaceae</i>	47	6.30
<i>Euphorbiaceae</i>	47	6.30
<i>Rubiaceae</i>	45	6.04
<i>Acanthaceae</i>	36	4.82
<i>Compositae</i>	30	4.02
<i>Cyperaceae</i>	25	3.36
<i>Convolvulaceae</i>	16	2.14
<i>Labiatae</i>	15	2.01
<i>Scrophulariaceae</i>	14	1.89

Further, species belonging to the first 13 families, namely *Gramineae*, *Papilionaceae*, *Euphorbiaceae*, *Rubiaceae*, *Acanthaceae*, *Compositae*, *Cyperaceae*, *Convolvulaceae*, *Labiatae*, *Scrophulariaceae*, *Malvaceae*, *Rutaceae* and *Mimosaceae* cover 50% of the total number of taxa in the flora.

The proportion of families in the flora of Courtallum to genera is 1 : 3.5. An analysis of the different families in the flora with regard to the number of genera under each shows that the following families contain more than 10 genera each (number of genera given in parenthesis). *Gramineae* (34), *Papilionaceae* (26), *Euphorbiaceae* (24), *Compositae* (22), *Acanthaceae* (21), *Rubiaceae* (19), *Labiatae* (12) and *Cyperaceae* (10).

The proportion of genera to species in the flora of Courtallum is 1 : 1.7. Thus, in general, the various genera are very poor in their species representation in the area. However the following genera are more or less well represented in the flora (number of species under each given in brackets). *Hedyotis* (10), *Solanum* (9), *Cassia* (8), *Ficus* (8), *Capparis* (7), *Impatiens* (7), *Crotalaria* (7), *Psychotria* (7), *Jasminum* (7), and *Ipomoea* (7). Table III gives the percentage of families, genera, species and varieties in the flora grouped into dicotyledones and monocotyledones.

Table III

Group	Dicots	Percentage of total	Monocots	Percentage of total
No. of families	107	74.04	24	25.96
No. of genera	382	82.32	82	18.78
No. of species	599	82.50	127	17.50
No. of varieties	17	89.59	2	10.41

When compared to annuals and biennials, the flora is dominated by perennial species. Roughly 75% of the total number of species are perennials and of these a majority are woody plants. The phanerogamic water plants in the flora comprises of about 76 taxa. As such the group is very plastic and includes several of the marshy and wet land species.

Climbers are not dominant in the flora and are represented by hardly about 16.5% of the total number of species. Similarly epiphytes are also rare, numbering to about 10 species belonging to the families *Balsaminaceae* and *Orchidaceae*. Among parasites, about 15 species are found growing on tree trunks and another 4 species are root parasites. A few species of insectivorous plants also flourish in Courtallum forests and 4 species of 'eel-trap' bearing *Utricularia* and a single species of *Drosera* represent that group in the flora.

PHYTOGEOGRAPHICAL ANALYSIS

By virtue of its geographical position, Courtallum abode species characteristic of both the adjoining botanical areas, namely the West Coast and Deccan plateau of Peninsular India. Earlier, based on the occurrence of the different taxa in the flora, Nair (1982) had derived its affinities with that of Sri Lanka, Malesia and also eastern India. The following categories of floristic elements are recorded in the Flora.

Species of limited distribution (i.e. in India and adjoining areas)

Pluri-regional species or 'wides'

Weeds

Exotics and escapes from cultivation.

Among the four categories, the first group of plants comprises about 52% of the total floristic elements recorded from the area and they are classified as : Species confined to Peninsular India, Species of Peninsular India and Sri Lanka, Species of other parts of India, Species of Indo-Malayan region and Species of Africa. The remaining 48% of plants in the flora are 'wides', weeds or exotic species with cosmopolitan distribution.

Species of limited distribution

Plants endemic to Tirunelveli hills and adjoining parts of Peninsular India

Mainly those plants endemic to Tirunelveli and adjoining parts of Peninsular India recorded from Courtallum are species confined to the southern portion of the Western Ghats. In fact out of the 2, 545 endemic

species of Peninsular India (Chatterjee, 1939), about 1,500 species are restricted to Western Ghats in their distribution and this shows that about 60% of the total endemic flora of Peninsular India is confined to Western Ghats. This high endemism noted for Western Ghats is often compared to that of Oceanic Islands (Subramanyam & Nayar, 1974).

In the flora of Courtallum there are about 35 taxa confined to Tirunelveli hills and adjoining parts of Peninsular India. Plants like *Aglaia leprocarpa* var. *bourdillonii*, *Chionanthus linocieroides*, *Eriococcus ovalifolia*, *Hedyotis eulata*, *Impatiens auriculata*, *Ischaemum rangacharianum*, *Lasi-anthus blumeanus*, *Lobelia courtallensis*, *Ophiorrhiza eriantha*, *Ophiorrhiza. uniflora*, *Pavetta blanda*, *Pavetta eriantha*, *Psychotria connata*, *Pterospermum obtusifolium*, *Symplocos macrocarpa*, *Tylophora subramanii*, etc. are some such species endemic to this part of Western Ghats. Roughly this group of plants represent approximately 4.60% of the total number of species in the flora.

Plants endemic to Peninsular India

About 90 taxa in the flora of Courtallum are plants endemic to Peninsular India. This group of plants represents about 3.75% of the 2,545 taxa endemic for the whole of Peninsular India (Chatterjee, 1939). Among the different members of Peninsular Indian endemics in the flora, plants belonging to following families are well represented (the number given against each family denotes the number of taxa). *Annonaceae* (4), *Capparaceae* (2), *Flacourtiaceae* (3), *Rutaceae* (3), *Anacardiaceae* (2), *Fabaceae* (4), *Melastomataceae* (5), *Rubiaceae* (10), *Asteraceae* (3), *Oleaceae* (6), *Apocynaceae* (2), *Gesneriaceae* (2), *Acanthaceae* (11), *Loranthaceae* (2), *Euphorbiaceae* (7), *Commelinaceae* (2) and *Poaceae* (2). Those families with only one species each within this range are those represented by *Polygala raoii*, *Mesua nagassarum* var. *coromandeliana*, *Pterospermum xylocarpum*, *Grewia oppositifolia*, *Erythralium papulifolium*, *Ampelocissus arnottiana*, *Acacia ferruginea*, *Terminalia paniculata*, *Begonia albococcinea*, *Ceropegia intermedia*, *Cryptolepis grandiflora*, *Solanum vagum*, *Torenia bicolor*, *Ocimum adscendens*, *Knema attenuata*, *Cinnamomum macrocarpum* and *Pouzolzia wightii*. About 11.70% of the total number of species in the flora is represented by this group.

Plants distributed in Peninsular India and Sri Lanka

Those species distributed only in Peninsular India and Sri Lanka are a notable group of plants in the flora of Courtallum. There are 117 species representing about 10.05% of the total number of floristic elements recorded. Among the different members of the group, species

belonging to the families *Annonaceae* (2), *Menispermaceae* (2), *Tiliaceae* (2), *Balsaminaceae* (3), *Fabaceae* (7), *Asteraceae* (4), *Rubiaceae* (6), *Oleaceae* (3), *Asclepiadaceae* (3), *Gentianaceae* (2), *Gesneriaceae* (2), *Acanthaceae* (7), *Verbenaceae* (3), *Amaranthaceae* (2), *Loranthaceae* (3), *Euphorbiaceae* (8), *Moraceae* (2), *Urticaceae* (3), *Orchidaceae* (2), *Commelinaceae* (4) and *Poaceae* (4) are well represented (the approximate number of species under each family is given in parenthesis). Those families with only one species each within this range are represented by *Capparis divaricata*, *Garcinia cambogia*, *Hugonia mystax*, *Biophyium intermedium*, *Olax scandens*, *Memecylon angustifolium*, *Adenia hondala*, *Trichosanthes nervifolia*, *Begonia malabarica*, *Pimpinella heyneana*, *Schefflera stellata*, *Polypleurum stylosum*, *Apama siliquosa*, *Sarcandra chloranthoides*, *Pleiospermium alatum*, *Schumannianthus virgatus*, *Calamus pseudo-tenuis*, *Maesa perrottetiana*, *Madhuca longifolia* var. *longifolia*, *Solanum giganteum*, *Viscum ramosissimum*, etc. The well represented genera are *Impatiens* (3), *Osbeckia* (3), *Grewia* (2), *Jasminum* (2), *Ceropegia* (2), *Taxillus* (2), *Cyanotis* (2) and *Murdannia* (2); the number of species under each given in parenthesis. This is a significant group of plants in the flora of Courtallum which shows the affinity of the flora to that of Sri Lanka.

Plants of Indian region excluding Peninsular Indian endemics

There are about 20 taxa representing this group in the flora. Most of them are plants confined to Peninsular India, Assam or the foot of Himalayas. Plants like *Naravelia zeylanica*, *Maerua oblongifolia*, *Leptonychia moacurroides*, *Maytenus wallichii*, *Buchnanania lanzan*, *Dalbergia lanceolaria*, *Rostellularia procumbens* var. *simplex*, *Utricularia polygonoides* and *Canarium strictum* are few examples of some such species in the flora.

Indo-Malayan plants

About 75 taxa in the flora are Indo-Malayan in their distribution. Plants like *Tiliacora acuminata*, *Capparis zeylanica*, *Schleichera oleosa*, *Trichopus zeylanicus*, *Smilax zeylanica*, *Commelina paludosa*, *Ixora nigricans*, *Leea indica*, *Ficus retusa*, *Canna orientalis* and *Costus speciosus* are some such Indo-Malayan elements in the flora of Courtallum. Apart from Sri Lanka, Indo-Malayan elements are well represented.

West Asian elements

Species like *Centratherum anthelminticum*, *Prosopis cineraria*, *Euphorbia rosea*, etc. found in Courtallum also occur in West Asian countries like Arabia, Afghanistan or Persia and plants like *Hibiscus micranthus*, *Ecbolium viride*, *Canavalia virosa*, *Aristida funiculata*, *Brachiaria eru-*

ciformis extend up to the northern parts of Africa. Similarly *Cocculus hirsutus* distributed in Arabia, Pakistan, Burma, South China and Africa also extends to this part of India and Sri Lanka. However, West Asian elements are comparatively rare in the flora.

African plants

Excluding those north African plants mentioned above, there are about 15 species in the flora characteristic of tropical Africa. Plants like *Gymnema sylvestre*, *Secamone emetica*, *Strychnos potatorum*, *Thunbergia erecta*, *Pedallium murex*, *Evolvulus alsinoides*, *Peristrophe bicalyculata*, etc. are examples of such plants found in Courtallum.

Pluri-regional species or wides

Most of the plants belonging to this group are those characterised by pantropical or cosmopolitan distribution. Such plants, often designated as 'wides' are recorded in the following families (the number given in brackets against each family gives the approximate number of species under each) *Menispermaceae* (1), *Cleomaceae* (1), *Caryophyllaceae* (1), *Malvaceae* (7), *Sterculiaceae* (2), *Tiliaceae* (1), *Oxalidaceae* (2), *Sapindaceae* (2), *Fabaceae* (6), *Caesalpinjiaceae* (3), *Mimosaceae* (4), *Anacardiaceae* (1), *Elatinaceae* (1), *Apiaceae* (1), *Asteraceae* (9), *Apocynaceae* (1), *Boraginaceae* (1), *Convolvulaceae* (6), *Solanaceae* (3), *Scrophulariaceae* (2), *Acanthaceae* (2), *Polygonaceae* (1), *Plumbaginaceae* (1), *Hydrophyllaceae* (1), *Verbenaceae* (1), *Labiatae* (2), *Nyctaginaceae* (2), *Onagraceae* (1), *Amaranthaceae* (5), *Euphorbiaceae* (4), *Urticaceae* (1) *Hydrocharitaceae* (1), *Araceae* (1), *Cyperaceae* (18) and *Poaceae* (17).

Other wides in the flora of Courtallum are those species distributed in the continents of Asia, Africa and Australia and comprises of about 135 taxa in the flora. Among them, plants like *Cardamine hirsuta*, *Hybanthus enneaspermus*, *Opilia amentacea*, *Indigofera trita*, *Ludwigia perennis*, *Crassocephalum crepidioides*, *Calophyllum inophyllum*, *Viscum articulatum*, *Amischophacelus axillaris* and *Atylosia scarabaeoides* are species ranging from Africa through Asia to Australia whereas plants like *Microcos paniculata*, *Reissantia indica*, *Cissus quadrangularis*, *Justicia betonica* and *Cyanotis cristata* are rather restricted to Indo-Malayan and African range. Yet another 18 taxa classified as pluri-regional species are Asian and Australian plants and species like *Crataeva nurvala*, *Epithema carnosum*, *Tylophora indica*, *Blumea mollis*, etc. are Indo-Malayan in their distribution.

Weeds

According to Merrill (1946) the chief centres of origin of tropical weeds are Mexico and some parts of South America, especially Brazil in the New World and parts of India and Africa in the Old World. Based on

their origin or distribution, weeds in the flora of Courtallum may be classified as follows.

Tropical American

Tridax procumbens, *Synedrella nodiflora*, *Corchorus aestuans*, *Ruellia tuberosa*, etc.

Mexican

Erigeron karvinskianus, *Eupatorium adenophorum*, etc.

South American

Acanthospermum hispidum, *Gomphrena celosoides*, *Croton bonplandianum*, *Ludwigia octovalvis* subsp. *sessiliflora*, *Pedilanthus tithymaloides*, etc.

Paleotropical

Cleoma viscosa, *Ludwigia perennis*, *Spermacoce hispida*, *Canscora heteroclita*, *Achyranthes aspera*, etc.

Pantropical

Poylcarpaea corymbosa, *Sida cordifolia*, *Sida rhombifolia*, *Urena lobata*, *Melochia corchorifolia*, *Cardiospermum helicacabum*, *Clitoria ternatea*, *Vernonia cineria*, *Bidens bipinnata*, *Scoparia dulcis*, *Pistia stratiotes* and several species of sedges and grasses.

Exotic species and escapes from cultivation

Exotic species growing in Courtallum as weeds, escapes from cultivation or as plantation crops are fairly large in number. Species like *Lantana camara* var. *aculeata*, *Jatropha gossypifolia*, *Pedilanthus tithymaloides*, *Anacardium occidentale*, *Camellia sinensis*, *Catharanthus roseus*, *Pithecellobium dulce*, *Labiab purpureus*, *Garcinia mangostana*, *Myristica fragrans*, *Syzygium jambos*, *Amherstia nobilis* and *Tithonia rotundifolia* are fully naturalized.

GENERAL FORMAT

In general, the circumscription and arrangement of the families in the Flora is as in Arthur Cronquist (1968) with present day delimitation of certain families.

KEY TO FAMILIES

- 1a. Seeds with two cotyledons ; leaves often net-veined ; flowers generally tetra or pentamerous
 - 2a. Petals all or at least some free at the base or petals absent
 - 3a. Flowers with two or more free carpels GROUP I
 - 3b. Flowers with a single carpel or a syncarpus gynoeceum (if sub-apocarpus, then carpels united at their base or by a common style)
 - 4a. Perianth of 2 whorls, distinct as calyx and corolla
 - 5a. Stamens more than twice the number of petals GROUP II
 - 5b. Stamens twice the number of petals or fewer than that
 - 6a. Stamens and perianth perigynous or ovary fully or partly inferior GROUP IV
 - 6b. At least one whorl of the perianth hypogynous or stamens hypogynous or inserted on a hypogynous disc GROUP III
 - 4b. Perianth of one whorl, sometimes petaloid or absent (if the perianth is of two whorls then the segments of each whorl almost indistinguishable into calyx or corolla)
 - 7a. Stamens borne on the perianth GROUP VI
 - 7b. Stamens not borne on the perianth GROUP V
 - 2b. Petals all united at the base, sometimes the corolla tube very short
 - 8a. Flowers with superior ovary
 - 9a. Flowers actinomorphic GROUP VII
 - 9b. Flowers zygomorphic GROUP VIII
 - 8b. Flowers with partly or fully inferior ovary GROUP IX
- 1b. Seeds with only one cotyledon ; leaves often parallel veined ; flowers generally trimerous GROUP X

GROUP I

- 1a. Aquatic plants with peltate leaves NYMPHAEACEAE 7
- 1b. Terrestrial plants without peltate leaves

- 2a. Herbs or succulent shrubs or if climbers then with bisexual flowers and opposite leaves
 - 3a. Leaves succulent ; stamens in one or two whorls ; torus flat or concave ; carpels few CRASSULACEAE 42
 - 3b. Leaves not succulent ; stamens arranged spirally ; torus elongated or cone-like ; carpels numerous RANUNCULACEAE 8
- 2b. Shrubs or trees or if climbers then with unisexual flowers and alternate leaves
 - 4a. Leaves simple, not pellucid-dotted
 - 5a. Ovary apocarpus ; flowers bisexual ; anthers with a protruded broad truncate connective ANNONACEAE 1
 - 5b. Ovary syncarpus ; flowers dioecious ; anthers with a narrow connective, not protruded MENISPERMACEAE 9
 - 4b. Leaves often compound, pellucid-dotted RUTACEAE 73

GROUP II

- 1a. Perianth and stamens hypogynous
 - 2a. Placentation axile or free central
 - 3a. Placentation free central ; sepals 2 PORTULACACEAE 17
 - 3b. Placentation axile ; sepals 5 or 3
 - 4a. Ovules solitary or many, pendulous
 - 5a. Scandent shrubs ; leaves dispersed throughout the branches ALANGIACEAE 53
 - 5b. Trees ; leaves confined to the apex of twiggy terminal branches LECYTHIDACEAE 27
 - 4b. Ovules not as above
 - 6a. Leaves alternate
 - 7a. Perianth with the inner whorl tubular or bifid, nectariferous ; fruit a group of follicles RANUNCULACEAE 8
 - 7b. Not as above
 - 8a. Stipules absent ; leaves evergreen THEACEAE 21
 - 8b. Stipules present ; leaves usually deciduous
 - 9a. Stamens free ; anthers 2-loculed TILIACEAE 24
 - 9b. Stamens united into a tube around the style ; anthers 1-loculed MALVACEAE 26
 - 6b. Leaves opposite GUTTIFERAE 23

- 2b. Placentation parietal or marginal
 - 10a. Carpel only one ; fruit a legume
 - 11a. Corolla papilionaceous ; leaves simple, digitate or simply pinnate or unifoliate PAPILIONACEAE 43
 - 11b. Corolla not papilionaceous ; leaves often pinnate or bipinnate
 - 12a. Flowers actinomorphic ; stamens 4-many MIMOSACEAE 45
 - 12b. Flowers zygomorphic ; stamens 10-5 CAESALPINIACEAE 44
 - 10b. Carpels 2 or more ; fruit not a legume
 - 13a. Leaves opposite GUTTIFERAE 23
 - 13b. Leaves alternate
 - 14a. Plants glandular-hairy ; fruits dehiscent ; herbs CLEOMACEAE 36
 - 14b. Plants not glandular-hairy ; fruits not dehiscent ; shrubs or trees CAPPARACEAE 35
- 1b. Perianth and stamens perigynous or epigynous
 - 15a. Flowers unisexual ; leaf-base oblique BEGONIACEAE 33
 - 15b. Flowers bisexual ; leaf base not oblique
 - 16a. Placentation free central ; ovary partly inferior PORTULACACEAE 17
 - 16b. Placentation not free central ; ovary mostly superior or fully inferior
 - 17a. Aquatic plants ; with floating leaves not gland-dotted NYMPHAEACEAE 7
 - 17b. Terrestrial plants ; leaves gland-dotted MYRTACEAE 49

GROUP III

- 1a. Ovary with free-central placentation
 - 2a. Flowers with 4-5 sepals CARYOPHYLLACEAE 16
 - 2b. Flowers with 2 sepals PORTULACACEAE 17
- 1b. Ovary with axile, parietal, basal or marginal placentation
 - 3a. Resinous trees or shrubs ; leaves simple or pinnate, alternate ; flowers with a hypogynous disc ; stamens 5 or 10 ; fruit drupe-like, one seeded ANACARDIACEAE 72
 - 3b. Not as above
 - 4a. Placentation axile or almost apical
 - 5a. Anthers opening by terminal pores ; stamens not antipetalous POLYGONACEAE 19

- 5b. Anthers opening by longitudinal pores or slits ; stamens antipetalous
- 6a. Herbs
- 7a. Petals and stamens numerous ; plants with succulent leaves MOLLUGINACEAE 15
- 7b. Petals 4-5, stamens 4-10 ; leaves not succulent
- 8a. Aquatic or semiaquatic annuals ELATINACEAE 22
- 8b. Not as above
- 9a. Leaves aromatic, glandular-punctate ; ovary often borne on a gynophore RUTACEAE 73
- 9b. Leaves neither aromatic nor glandular - punctate ; gynophore often absent
- 10a. Fruits more or less 10-locular ; leaves always simple LINACEAE 78
- 10b. Fruits 2-5 locular ; leaves simple or trifoliate, entire
- 11a. Perianth actinomorphic ; leaves compound ; styles 5 OXALIDACEAE 75
- 11b. Perianth strongly zygomorphic, spurred ; leaves simple ; style one or obsolete BALSAMINACEAE 76
- 6b. Trees, shrubs or climbers
- 12a. Plants with hooked branches and dimorphic leaves ANCISTROCLADACEAE 32
- 12b. Plants without hooked branches or dimorphic leaves
- 13a. Flowers with a well defined hypogynous disc below and around the ovary
- 14a. Stamens antipetalous
- 15a. Climbers usually with tendrils ; inflorescence often leaf-opposed VITACEAE 69

- 15b. Trees or shrubs (not climbers) without tendrils ; inflorescence not leaf opposed
 - 16a. Petals valvate LEEACEAE 68
 - 16b. Petals imbricate SABIACEAE 10
- 14b. Stamens not antipetalous
 - 17a. Leaves with pellucid aromatic glands RUTACEAE 73
 - 17b. Leaves without pellucid aromatic glands
 - 18a. Leaves simple, entire or toothed ; stamens 4-5 CELASTRACEAE 61
 - 18b. Leaves palmately-lobed or compound ; stamens 5-10
 - 19a. Stamens united into a tube around the style MELIACEAE 74
 - 19b. Stamens free
 - 20a. Resinous trees ; style one ; fruit 1-5 seeded berry ; ovules usually 2 in each loculus of the ovary BURSERACEAE 71
 - 20b. Not as above SAPINDACEAE 70
- 13b. Flowers without a hypogynous disc
 - 21a. Petals long-clawed, often fringed or toothed ; some or all the sepals with a pair of conspicuous glands at their base outside MALPIGHIACEAE 79
 - 21b. Not as above
 - 22a. Filaments united below ; free above
 - 23a. Stipules persistent, interpetiolar ; petals appendaged ERYTHROXYLACEAE 77
 - 23b. Stipules caducous, not interpetiolar ; petals not appendaged STERCULIACEAE 25
 - 22b. Filaments free throughout their length OLEACEAE 97
- 4b. Placentation parietal, basal or marginal
 - 24a. Flowers zygomorphic (except *Mimosaceae*)
 - 25a. Ovary of one carpel with marginal placentation ; fruit a legume, sometimes indehiscent and lomented
 - 26a. Corolla zygomorphic
 - 27a. Corolla papilionaceous ; adaxial petal exterior PAPILIONACEAE 43
 - 27b. Corolla not papilionaceous ; adaxial petal interior CAELSALPINIACEAE 44
 - 26b. Corolla actinomorphic MIMOSACEAE 45

- 25b. Ovary of 2 or more carpels or if of one carpel then with basal placentation ; fruit not a legume
- 28a. Stamens and petals 5 each ; leaves stipulate VIOLACEAE 30
- 28b. Stamens and petals 4 or 6 each ; leaves exstipulate
- 29a. Plants glandular-hairy ; fruits dehiscent ; herbs CLEOMACEAE 36
- 29b. Plants not glandular-hairy ; fruits not dehiscent ; shrubs or trees CAPPARACEAE 35
- 24b. Flowers actinomorphic
- 30a. Petals and stamens numerous ; leaves succulent MOLLUGINACEAE 15
- 30b. Petals and stamens definite, usually less than 7 ; leaves not succulent
- 31a. Plants insectivorous ; glandular hairs present on the leaves DROSERACEAE 28
- 31b. Plants not insectivorous ; glandular hairs absent from the leaves
- 32a. Climbers with tendrils ; ovary and stamens borne on an androgynophore ; corona present PASSIFLORACEAE 31
- 32b. Not as above
- 33a. Stamens 6, the 4 inner longer ; carpels apparently two ; ovary divided by a false septum CRUCIFERAE 37
- 33b. Stamens 5, similar ; carpels 2-5 ; ovary not divided by any false septum VIOLACEAE 30

GROUP IV

- 1a. Petals and stamens indefinite ; plants succulent MOLLUGINACEAE 15
- 1b. Petals and stamens definite, usually less than 10 ; plants not succulent

- 2a. Anthers opening by pores or short pore-like slits ;
stamens often geniculate MELASTOMATACEAE 51
- 2b. Anthers opening by length-wise slits ; stamens not
geniculate
 - 3a. Carpel one ; placentation marginal (or ovules
suspended from the apex of the ovary
in *Combretaceae*)
 - 4a. Fruit a legume or a lomentum ; carpels
with ovules on a marginal placenta
 - 5a. Corolla actinomorphic ; petals
valvate MIMOSACEAE 45
 - 5b. Corolla zygomorphic ; petals imbri-
cate
 - 6a. Corolla papilionaceous PAPILIONACEAE 43
 - 6b. Corolla not papilionaceous CARSALPINIACEAE 44
 - 4b. Fruit not a legume or lomentum
(often two winged) ; carpels with
ovules hanging from the apex of the
ovary COMBRETACEAE 52
 - 3b. Carpels more than one (syncarpus) ; placenta-
tion not marginal
 - 7a. Placentation parietal
 - 8a. Climbing herbs or shrubs with
tendrils ; flowers unisexual CUCURBITACEAE 34
 - 8b. Erect herbs without tendrils ; flowers
bisexual CRUCIFERAE 37
 - 7b. Placentation axile, basal, apical or free-
central
 - 9a. Sepals 2 ; placentation free-central PORTULACACEAE 17
 - 9b. Sepals more than 2 ; placentation
axile, basal or apical
 - 10a. Stamens antipetalous
 - 11a. Leaves stipulate RHAMNACEAE 67
 - 11b. Leaves exstipulate
 - 12a. Ovary sometimes
immersed in the
disc making it
perigynous ; ovules
in the whole ovary
more than one OLACACEAE 54
 - 12b. Ovary not immer-
sed in the disc,
i.e. hypogynous ;
ovule in the whole
ovary one OPILIACEAE 56
 - 10b. Stamens antisepalous

- 13a. Flowers in umbels or sometimes condensed into heads ; leaves usually compound
 - 14a. Fruit a schizocarp of two mericarps ; flowers bisexual ; ovary 2-locular UMBELLIFERAE 82
 - 14b. Fruit a berry ; flowers often unisexual ; ovary 3-4 locular ARALIACEAE 81
- 13b. Flowers not in umbels or condensed heads ; leaves usually simple
 - 15a. Leaves glandular punctate, aromatic ; ovary borne on a gynophore RUTACEAE 73
 - 15b. Leaves not glandular-punctate or aromatic ; ovary sessile
 - 16a. Ovary superior
 - 17a. Trees, shrubs or climbers
 - 18a. Flowers with a disc
 - 19a. Petals imbricate CELASTRACEAE 61
 - 19b. Petals valvate
 - 20a. Ovary 3-locular ; calyx not enlarged in fruit HIPPOCRATEACEAE 60
 - 20b. Ovary 1-locular ; calyx enlarged in fruits, enclosing it ERYTHROPALACEAE 55
 - 18b. Flowers without any disc ICACINACEAE 62
 - 17b. Herbs (often prostrate) LYTHRACEAE 48
 - 16b. Ovary inferior
 - 21a. Sap milky ; petals 5 CAMPANULACEAE 105
 - 21b. Sap watery ; petals 2 to 4 ONAGRACEAE 50

GROUP V

- 1a. Flowers unisexual
 - 2a. Ovary 3-locular ; styles 3
 - 3a. Fruit not a loculicidal capsule ; sap often milky if present

- 4a. Leaves pinnately trifoliate BISCHOFIACEAE 65
- 4b. Leaves simple or digitately compound EUPHORBIACEAE 64
- 3b. Fruit a loculicidal capsule ; sap not milky BUXACEAE 63
- 2b. Ovary 1, 2 or 4 locular ; styles 1 or 2
 - 5a. Resinous trees or shrubs ; flowers with disc ANACARDIACEAE 72
 - 5b. Not as above
 - 6a. Stamens 2 ; anther locules back to back OLEACEAE 97
 - 6b. Stamens more than 2 ; anther locules not back to back
 - 7a. Placentation parietal ; stamens numerous ; fruit a berry or capsule FLACOURTIACEAE 29
 - 7b. Not as above
 - 8a. Mostly trees or shrubs, very rarely herbs ; sap milky MORACEAE 12
 - 8b. Mostly herbs
 - 9a. Seeds with straight embryo ; plants with stinging hairs or rough bark ; cystoliths often present on the leaves URTICACEAE 13
 - 9b. Seeds with curved embryo ; plants without stinging hairs ; cystoliths absent from the leaves
 - 10a. Perianth not scarious, either greenish or absent ; stamens free
 - 11a. Fruits with faveo-late-reticulate often flattened endocarps STILAGINACEAE 66
 - 11b. Fruits not as above EUPHORBIACEAE 64
 - 10b. Perianth scarious ; stamens often connate below AMARANTHACEAE 18
 - 1b. Flowers bisexual.
 - 12a. Trees or shrubs (except *Corchorus*)
 - 13a. Stamens numerous ; ovary with 5 or more locules TILIACEAE 24

- 13b. Stamens 12 or fewer ; ovary with less than 5 locules.
- 14a. Leaves with pellucid aromatic glands ; anthers valvular or longitudinally splitting
- 15a. Stamens free among themselves LAURACEAE 3
- 15b. Stamens connate into a column MYRISTICACEAE 2
- 14b. Leaves without pellucid aromatic glands ; anthers opening by slits
- 16a. Stamens 2 ; leaf base not oblique OLEACEAE 97
- 16b. Stamens 4-8 ; leaf base oblique ULMACEAE 11
- 12b. Herbs, climbers or succulent herbs
- 17a. Perianth absent ; flowers borne on spikes PIPERACEAE 5
- 17b. Perianth present ; flowers not borne on spikes
- 18a. Submerged aquatics with a thalloid plant body PODOSTEMACEAE 46
- 18b. Not as above
- 19a. Leaves stipulate, stipules ochraceous ; fruit often a 3-seeded nut POLYGONACEAE 16
- 19b. Leaves exstipulate ; fruit not a 3-seeded nut
- 20a. Ovary 1-carpelled, 1-seeded ; perianth usually petaloid ; bracts sometimes calyx-like NYCTAGINACEAE 14
- 20b. Ovary of two or more carpels, 1-many seeded ; perianth not petaloid
- 21a. Ovules solitary on a basal placenta ; leaves often alternate AMARANTHACEAE 18
- 21b. Ovules numerous on a freecentral placenta ; leaves opposite. CARYOPHYLLACEAE 16

GROUP VI

- 1a. Submerged aquatics or marsh herbs with cordate leaves HALORAGACEAE 47
- 1b. Not as above
 - 2a. Trees, shrubs or woody climbers (not parasites)
 - 3a. Ovary inferior
 - 4a. Stamens alternating with the sepals RHAMNACEAE 67
 - 4b. Stamens opposite or more numerous than the sepals
 - 5a. Stamens 4-5 SANTALACEAE 57
 - 5b. Stamens 1-3 CHLORANTHACEAE 4
 - 3b. Ovary superior LAURACEAE 3
 - 2b. Herbs, slender climbers or branch parasites
 - 6a. Branch parasites
 - 7a. Flowers bisexual LORANTHACEAE 58
 - 7b. Flowers unisexual VISCACEAE 59
 - 6b. Free living terrestrial plants
 - 8a. Leaf-base oblique ; ovary fully inferior, 3-locular BEGONIACEAE 33
 - 8b. Not as above
 - 9a. Ovary superior LYTHRACEAE 48
 - 9b. Ovary partly inferior
 - 10a. Ovules 1-5 in an ovary ; seed one
 - 11a. Ovary 6-locular ; perianth 3-lobed or tubular and zygomorphic ARISTOLOCHIACEAE 6
 - 11b. Not as above
 - 12a. Stamens 4-5 SANTALACEAE 57
 - 12b. Stamens 1-3 CHLORANTHACEAE 4
 - 10b. Ovules and seeds numerous ONAGRACEAE 50

GROUP VII

- 1a. Stamens 2, anther locules back to back ; plants woody OLEACEAE 97
- 1b. Not as above
 - 2a. Ovary apocarpus ; plants succulent CRASSULACEAE 42
 - 2b. Ovary syncarpus or at least the styles united or rarely one carpellate, when fruit a legume ; plants not succulent
 - 3a. Trees or shrubs with milky latex ; leaves alternate SAPOTACEAE 38
 - 3b. Not as above
 - 4a. Stamens antipetalous ; placentation axile, free-central or basal
 - 5a. Leaves pinnately compound ; placentation axile
 - 6a. Plants with tendrils ; ovary 2 loculed VITACEAE 69
 - 6b. Plants without tendrils ; ovary 3-6 loculed LEEACEAE 68
 - 5b. Leaves mostly simple ; placentation free central or basal
 - 7a. Placentation free-central ; ovules usually numerous, though fruit is often one seeded
 - 8a. Trees or shrubs ; fruit a berry or drupe MYRSINACEAE 41
 - 8b. Herbs ; fruit a capsule PORTULACACEAE 17
 - 7b. Placentation basal ; ovule one, pendulous ; fruit one seeded PLUMBAGINACEAE 20
 - 4b. Stamens antiseptalous or more numerous than the corolla lobes ; placentation never free-central
 - 9a. Fruit a legume or lomentum
 - 10a. Corolla papilionaceous ; stamens monadelphous or diadelphous PAPILIONACEAE 43
 - 10b. Corolla not papilionaceous ; stamens free or shortly connate at base
 - 11a. Flowers actinomorphic MIMOSACEAE 45
 - 11b. Flowers zygomorphic CAESALPINIACEAE 44
 - 9b. Fruit not a legume or lomentum
 - 12a. Anthers porocidal

- 13a. Leaves alternate SOLANACEAE 89
- 13b. Leaves opposite GENTIANACEAE 85
- 12b. Anthers opening by longitudinal slits
 - 14a. Stamens twice the number of petals
 - 15a. Plants with pellucid aromatic gland-dotted leaves ; calyx cupular (not toothed) RUTACEAE 73
 - 15b. Plants without pellucid aromatic gland-dotted leaves ; calyx toothed
 - 16a. Flowers unisexual ; fruits fleshy EBENACEAE 39
 - 16b. Flowers bisexual ; fruits not fleshy THEACEAE 21
 - 14b. Stamens as many as the petal lobes
 - 17a. Leaves alternate or basal
 - 18a. Stamens not epipetalous but hypogynous ; herbs or shrubs with milky latex CAMPANULACEAE 105
 - 18b. Stamens epipetalous ; herbs or shrubs without milky sap
 - 19a. Flowers in scorpioid cymes or calyx with appended sinuses ; style gynobasic or terminal
 - 20a. Style terminal ; fruits many seeded capsules ; plants aquatic HYDROPHYLLACEAE 91
 - 20b. Style gynobasic ; fruit of four nutlets BORAGINACEAE 92
 - 19b. Flowers neither in scorpioid cymes nor the calyx appendaged ; style always terminal
 - 21a. Placentation parietal GESNERIACEAE 99
 - 21b. Placentation axile
 - 22a. Ovules one or two in each loculus of the ovary
 - 23a. Sepals free ; corolla lobes contorted and infolded ; twining herbs or shrubs CONVOLVULACEAE 90

- 23b. Sepals connate ; corolla lobes not contorted or infolded ; erect shrubs EHRETIACEAE 93
- 22b. Ovules numerous in each loculus of the ovary
 - 24a. Corolla lobes usually folded, contorted or valvate ; septum of the ovary oblique ; internal phloem present SOLANACEAE 89
 - 24b. corolla lobes imbricate ; septum of the ovary horizontal ; internal phloem absent SCROPHULARIACEAE 98
- 17b. Leaves opposite
 - 25a. Plants with milky latex ; fruit of two follicles ; seeds with silky appendages
 - 26a. Pollen granular, not agglutinated into wax-like masses, transferred directly from the anthers ; corona absent ; corolla lobes contorted in bud APOCYNACEAE 86
 - 26b. Pollen agglutinated into wax-like masses called pollinia transferred by specialized transillators ; corona usually present ; corolla lobes contorted or valvate
 - 27a. Filaments of the stamens free ; anthers without horny wings PERIPLOCACEAE 88
 - 27b. Filaments of the stamens united ; anthers with horny wings ASCLEPIADACEAE 87
 - 25b. Plants without milky latex ; fruit a capsule or berry ; seeds without silky appendages
 - 28a. Flowers in scorpioid cymes ; plants aquatic HYDROPHYLLACEAE 91
 - 28b. Flowers not in scorpioid cymes ; plants not aquatic
 - 29a. Placentation axile

- 30a. Plants without lepidote or glandular-stellate indumentum ; intraxylary phloem present
 - 31a. Corolla contorted ; fruit berry-like (saccate) POTALIACEAE 84
 - 31b. Corolla valvate ; fruit a drupe or berry LOGANIACEAE 83
- 30b. Plants with lepidote or glandular-stellate indumentum ; intraxylary phloem absent BUDDLEIACEAE 96
- 29b. Placentation parietal GENTIANACEAE 85

GROUP VIII

- 1a. Stamens more numerous than the corolla lobes or anthers porecidal
 - 2a. Anthers porecidal ; leaves undivided ; ovary of many carpels syncarpus POLYGALACEAE 80
 - 2b. Anthers opening by slits ; leaves variously divided or compound ; ovary of one carpel
 - 3a. Leaves pinnate or trifoliate ; perianth not spurred
 - 4a. Flowers actinomorphic MIMOSACEAE 45
 - 4b. Flowers zygomorphic
 - 5a. Corolla papilionaceous ; stamens monadelphous PAPILIONACEAE 43
 - 5b. Corolla not papilionaceous ; stamens free CAESALPINIACEAE 44
 - 3b. Leaves lacinate ; perianth spurred RANUNCULACEAE 8
- 1b. Stamens as many as the corolla lobes or fewer ; anthers not porecidal
 - 6a. Stamens as many as the corolla lobes ; zygomorphy of the flower weak
 - 7a. Flowers in scorpid cymes ; fruit of 4, one-seeded nutlets BORAGINACEAE 92
 - 7b. Flowers not in scorpioid cymes ; fruit a many-seeded capsule SCROPHULARIACEAE 98
 - 6b. Stamens fewer than the corolla lobes, i.e. 4 or 2 ; zygomorphy of the flower pronounced
 - 8a. Placentation axile ; ovules 4 to many
 - 9a. Ovules numerous but not superposed
 - 10a. Seeds winged ; mainly trees ; leaves pinnate or digitate BIGNONIACEAE 100
 - 10b. Seeds wingless ; herbs or shrubs ; leaves simple

- 11a. Corolla lobes variously imbricate in bud, septum of the ovary horizontal SCROPHULARIACEAE 98
- 11b. Corolla lobes duplicate or contorted-plicate in bud ; septum of the ovary oblique SOLANACEAE 89
- 9b. Ovules 4 or more, superposed
 - 12a. Fruit a capsule
 - 13a. Leaves opposite or verticillate, often with cystoliths ; pedicels without swollen glands at their base ACANTHACEAE 101
 - 13b. Leaves alternate or the upper opposite, without cystoliths ; pedicels with swollen glands at their base PEDALIACEAE 103
 - 12b. Fruit not a capsule
 - 14a. Styles gynobasic, ovary deeply and vertically 4-lobed ; fruit of 4 nutlets LABIATAE 95
 - 14b. Style terminal, ovary not vertically lobed ; fruit a drupe or berry VERBENACEAE 94
- 8b. Placentation free-central or parietal ; ovules many or one or two
 - 15a. Placentation free central ; corolla spurred LENTIBULARIACEAE 104
 - 15b. Placentation parietal ; corolla not spurred (rarely saccate)
 - 16a. Seeds winged BIGNONIACEAE 100
 - 16b. Seeds not winged GESNERIACEAE 99

GROUP IX

- 1a. Inflorescence a capitulum COMPOSITAE 107
- 1b. Inflorescence not a capitulum
 - 2a. Leaves alternate or all basal
 - 3a. Unisexual climbers with tendrils ; stamens 1-5 ; placentation parietal ; fruit a pepo (berry-like) CUCURBITACEAE 34
 - 3b. Not as above

- 4a. Stamens 10-many ; trees
 - 5a. Leaves gland-dotted ; corolla cauducous MYRTACEAE 49
 - 5b. Leaves gland-dotted ; corolla persistent SYMPLOCACEAE 40
- 4b. Stamens 2, 4 or 5 ; herbs or shrubs
 - 6a. Stamens epipetalous, 2 or 4 ; milky sap absent in the plant body GESNERIACEAE 99
 - 6b. Stamens not epipetalous but hypogynous, 5 ; milky sap present in the plant body CAMPANULACEAE 105
- 2b. Leaves opposite RUBIACEAE 106,

GROUP X

- 1a. Trees or prickly scramblers with pinnately veined leaves ; flowers 3-merous PALMAE 120
- 1b. Not as above
 - 2a. Ovary superior or naked if perianth absent
 - 3a. Flowers borne in heads, often subtended by involucrel bracts ; at least the outer perianth whorl membranous
 - 4a. Flowers unisexual, monoecious ; outer perianth segments monomorphic ERIOCAULACEAE 112
 - 4b. Flowers bisexual ; outer perianth segments dimorphic XYRIDACEAE 110
 - 3b. Flowers not borne in heads nor the inflorescence subtended by involucrel bracts
 - 5a. Dioecious trees or shrubswith stiff leathery leaves ; plants often supported by stilt-roots ; perianth rudimentary PANDANACEAE 121
 - 5b. Not as above
 - 6a. Leaves with reticulate venation ; inflorescence a simple spadix ARACEAE 122
 - 6b. Not as above
 - 7a. Perianth well developed, never scarious throughout, sometimes reduced to small bract-like segments

- 8a. Carpels many, free or if the ovary is solitary then totally submerged aquatics ; plants mostly aquatic APONOGETONACEAE 109
- 8b. Carpels solitary or united ; plants terrestrial, erect or climbing
- 9a. Perianth 1-seriate or the inner and outer similar, often petaloid or united into a tube below
- 10a. Stem woody and erect or climbing ; root-stock never a bulb or corm
- 11a. Stems ending in a crown of leaves, fleshy or thin, spinescent or not ; fruit often a capsule AGAVACEAE 127
- 11b. Stem not ending in a crown of leaves but with scattered leaves or cladodes and spines, (plants always climbing) ; fruit a berry
- 12a. Leaves transformed into spinescent scales bearing in their axils, tufts of falcate cladodes ; plants without tendrils ASPARAGACEAE 126
- 12b. Leaves not as above (simple) ; plants with tendrils SMILACACEAE 128
- 10b. Stem usually herbaceous, not climbing ; root-stock usually a rhizome, corm or bulb LILIACEAE 123
- 9b. Perianth 2-seriate with the outer whorl dissimilar from the inner petaloid whorl and calyx like, the inner whorl often united or free below COMMELINACEAE 111
- 7b. Perianth typically scarious or reduced to bristles
- 13a. Leaves distichous ; anthers versatile ; stigma feathery
- 14a. Plants arboreous BAMBUSACEAE 115
- 14b. Plants herbaceous GRAMINEAE 114
- 13b. Leaves tristichous ; anthers basifixed ; stigma not feathery CYPERACEAE 113
- 2b. Ovary partly or fully inferior
- 15a. Flowers actinomorphic ; stamens 6, 4 or 3 or if the plants aquatic 3-many
- 16a. Unisexual climbers often with cordate leaves DIOSCOREACEAE 129
- 16b. Not as above (leaves sometimes cordate in *Trichopodaceae*)

- 17a. Plants aquatic ; stamens 3-many **HYDROCHARITACEAE 108**
- 17b. Plants terrestrial ; stamens 3 or 6
 - 18a. Plants with cordate or subcor-
date leaves ; ovules 2, super-
posed **TRICHOPODACEAE 130**
 - 18b. Plants without cordate or sub-
cordate leaves ; ovules many,
2-seriate
 - 19a. Inflorescence umbellate **AMARYLLIDACEAE 124**
 - 19b. Inflorescence spicate or
racemose **HYPOXIDACEAE 125**
- 15b. Flowers zygomorphic ; stamens 5, 2 or 1
 - 20a. Median petal modified into a lip ; stamens 2
or 1, united with a stigma bearing column ;
pollen in pollinia **ORCHIDACEAE 131**
 - 20b. Not as above
 - 21a. Sepals united into a tube ; anthers 2-
locular ; style often supported in the
groove of the stamen
 - 22a. Aerial plant parts aromatic **ZINGIBERACEAE 116**
 - 22b. Aerial plant parts not aromatic **COSTACEAE 117**
 - 21b. Sepals free or at most connivent ;
anthers 1-locular ; style free from the
stamen
 - 23a. Ovary 3-locular with numerous
ovules in each locus ; petiole
not banded at the junction with
the blade **CANNACEAE 118**
 - 23b. Ovary with one fertile locus
and a single ovule in it ; petiole
banded at the junction with the
blade **MARANTACEAE 119**

DICOTYLEDONES

1. ANNONACEAE

- 1a. Petals connivent and arching over the stamens and pistils forming a dome or mitriform cup
 - 2a. Flowers extra-axillary or leaf-opposed
 - 3a. Outer petals shorter than the inner ; stamens few OROPHEA 5
 - 3b. Outer petals longer than the inner ; stamens numerous MITREPHORA 4
 - 2b. Flowers axillary GONIOTHALAMUS 1
- 1b. Petals free or less often tending to adhere to some extent by their margins, not arching over the stamens and pistils forming a dome or mitriform
 - 4a. Petals both sets similar or subsimilar cup ; stamens many, connectives flat-topped or concave, rarely apiculate, the anther loculus concealed by connectives
 - 5a. Carpels hard, 5-7 mm thick-walled, sessile or subsessile ; stigmas disc-shaped ; seeds 8-10 MEIOGYNE 2
 - 5b. Carpels not hard, thin walled (about 1 mm thick only), mostly stalked ; stigmas globose, rectangular or irregularly shaped ; seeds 1-5 POLYALTHIA 6
 - 4b. Petals both sets dissimilar, the inner saccate to broad at base, the outer small and sepal like ; stamens few, anther locules not concealed by the flat-topped, rounded or pointed connective MILNIA 3

1. GONIOTHALAMUS (Bl.) Hook.f. et Thoms.

Goniothalamus wightii Hook. f. et Thoms., Fl. Ind. 1 : 106. 1855 & in Hook. f., Fl. Brit. Ind. 1 : 76. 1872 ; Bedd., Ic. Pl. Ind. Or. t. 73. 1870 ; King, Ann. R. Bot. Gard. Calcutta 4 : 92, t. 122B. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 18. 1915 ; D. Das, Bull. Bot. Surv. India 5 : 44. 1963.

Trees, 6-8 m high ; branches glabrous. Leaves 5-12.5 x 1.3-3.5 cm, linear-lanceate to oblong-lanceate, thin, glabrous, shortly acuminate at

apex ; petioles up to 0.5 cm long. Flowers axillary, solitary with thick pedicels.

Fl. : February.

Courtallum (*Robert Wight s. n.*, CAL).

2. MEIOGYNE Miq.

Meiogyne pannosa (Dalz.) Sinclair, Sarawak Mus. J. 5 : 604. 1951. *Unona pannosa* Dalz., Kew J. Bot. 3 : 207. 1851 ; Bedd., Fl. Sylvat. t. 52. 1869 & Ic. Pl. Ind. Or. t. 52. 1870 ; Hook. f. *et* Thoms. in Hook f., Fl. Brit. Ind. 1 : 58. 1872 ; King, Ann. R. Bot. Gard. Calcutta 4 : 55, t. 72. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 14. 1915. *Desmos pannosus* (Dalz.) Stafford, Bull. Torrey Bot. Club 39 : 506. 1912 ; D. Das, Bull. Bot. Surv. India 5 : 41. 1963.

Erect shrubs or small trees ; twigs puberulous, pale-straw coloured. Leaves 1.5-7.5 x 1.5-4.5 cm, lanceate or oblong-lanceate, thin, glabrous above, puberulous beneath, acuminate at apex, cuneate at base. Flowers solitary, sessile or subsessile, axillary or terminal ; petals densely tomentose ; carpels sessile or subsessile, ovoid, velvety when ripe.

Fl. & Fr. : July.

Courtallum (*Robert Wight s. n.*, CAL).

3. MILIUSA Lesch. ex DC.

- | | |
|---|-----------------------|
| 1a. Pedicels of the flowers more than 2 cm long | <i>M. wightiana</i> 2 |
| 1b. Pedicels of the flowers less than 1.5 cm long | <i>M. eriocarpa</i> 1 |

1. **Milium eriocarpa** Dunn in Gamble, Fl. Presid. Madras 1 (1) : 21. 1915 & in Kew Bull. 1916 : 58. 1916 ; D. Das, Bull. Bot. Surv. India 5 : 45. 1963. *M. indica* var. *tomentosa* Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 86. 1872.

Profusely branched trees, 4-5 m high ; branchlets strigose or yellowish-tomentose. Leaves 4.5-7.5 x 1-2.5 cm, ovate-oblong or oblong-lan-

ceate, glabrous above, tomentose beneath, obtuse, subacute or emarginate at apex, rounded at base. Flowers greenish-pink, solitary, axillary. Carpels pubescent.

Fl. & Fr. : July-January.

Rare at Shembagadevi and Chittaruvi in the shrubby forest.

2. *Milinsa wightiana* Hook. f. et Thoms., Fl. Ind. 1 : 149. 1855 & in Hook. f., Fl. Brit. Ind. 1 : 87. 1872 ; Bedd., Ic. Pl. Ind. Or. 86. 1870 ; King, Ann. R. Bot. Gard. Calcutta 4 : 156, t. 202B. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 21. 1915 ; Fries in Engl. & Prantl, Pflanzenfam. (ed. 2) 17a (2) : 99. 1959.

Trees ; branches glabrous or puberulous. Leaves 3-10 x 1-2.5 cm, oblong-lanceate, glabrous, somewhat pubescent along the nerves beneath, obtusely acuminate at apex, rounded or obtuse at base ; petioles 0.2-0.3 cm long or often obscure. Flowers solitary, axillary ; peduncles long, slender. Fruits a ring of globose or oblong, glabrous carpels.

Fl. & Fr. : August.

Courtallum (*Robert Wight s. n.*, CAL).

4. MITREPHORA (Bl.) Hook. f. et Thoms.

Mitrephora heyneana (Hook. f. et Thoms.) Thw., Enum. Pl. Zeyl. 8. 1858 ; Bedd., Ic. Pl. Ind. Or. 77. 1870 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 77. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 19. 1915 ; D. Das, Bull. Bot. Surv. India 5 : 44. 1963. *Orophea heyneana* Hook. f. et Thoms., Fl. Ind. 1 : 110. 1855.

Trees, 6-8 m high ; branches glabrous. Leaves 2.5-6.5 x 1.2-3 cm, ovate-lanceate, coriaceous, glabrous and shiny above, dull beneath, obtusely acuminate at apex, rounded at base ; petioles 0.5-0.8 cm long, stout. Flowers pinkish-yellow, fragrant, solitary, extra-axillary or leaf-opposed. Carpels 0.3-0.7 cm long, globose or subglobose, tomentose.

Fl. & Fr. : April-December.

Beautiful trees, fairly common in the valleys around Shembagadevi and in Tekkumalai.

5. OROPHEA Bl.

Orophea uniflora Hook. f. *et* Thoms., Fl. Ind. 1 : 110. 1855 ; Bedd., Ic. Pl. Ind. Or. t. 69 : 1870 ; Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 90. 1872 ; King, Ann. R. Bot. Gard. Calcutta 4 : 102, t. 144A. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 24. 1915.

Small trees ; branches slender, glabrous. Leaves 3.5-8 x 1.3-2.8 cm, ovate, elliptic-oblong or lanceate, thin, coriaceous, glabrous on both sides, acuminate at apex, acute at base ; petioles \pm 0.3 cm long, slender. Flowers solitary, extra-axillary.

Fl. : August.

Courtallum (Robert Wight s. n. & 37, CAL).

6. POLYALTHIA Bl.

- | | |
|---|------------------------|
| 1a. Leaves elliptic or oblong, slightly puberulous along the nerves beneath | |
| 2a. Young branches glabrous, white dotted ; leaves rounded or very obtuse at apex ; flowers in axillary or extra - axillary simple umbels | <i>P. suberosa</i> 3 |
| 2b. Young branches subpilose, dots absent ; leaves acuminate at apex ; flowers solitary, axillary | <i>P. korintj</i> 2 |
| 1b. Leaves lanceate or oblong - lanceate, pubescent beneath | <i>P. cerasoides</i> 1 |

1. **Polyalthia cerasoides** (Roxb.) Bedd., Fl. Sylvat. t. 1. 1869 ; Sant. *et* Wagh, Bull. Bot. Surv. India 5 : 107. 1963. *Uvaria cerasoides* Roxb., Pl. Corom. 1 : t. 38. 1795. *Polyalthia cerasoides* Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 63. 1872 ; King, Ann. R. Bot. Gard. Calcutta 4 : 65, t. 86B. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 17. 1915 ; D. Das, Bull. Bot. Surv. India 5 : 42. 1963. *Guatteria cerasoides* (Roxb.) Dun., Mon. Anon. 127. 1817 ; Wt. *et* Arn., Prodr. 10. 1834. *Kodigilai*, *Nagutalaili* (Tamil).

Trees, 3-6 m high ; young branches tomentose. Leaves 6.5-12.5 x 2-2.6 cm, lanceate or oblong-lanceate, glabrous above, pubescent beneath, acuminate at apex, obtuse at base ; petioles up to 0.5 cm long, pubescent. Flowers greenish in axillary 1-3 flowered pubescent peduncles. Carpels \pm 0.7 cm in diameter, globose, smooth, dark-red when ripe.

Fl. & Fr. : March-December.

Graceful trees in the valleys below Shembagadevi.

2. *Polyalthia korinti* (Dun.) Thw., Enum. Pl. Zeyl. 398. 1864 ; Sant. et Wagh, Bull. Bot. Surv. India 5 : 108. 1963. *Guatteria korinti* Dun., Mon. Anon. 133. 1817 ; Wt. et Arn., Prodr. 10. 1834 ; Wt., Ic. t. 398. 1840. *Polyalthia korinti* Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 64. 1872 ; King, Ann. R. Bot. Gard. Calcutta 4 : 79. t. 110A. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 16. 1915 ; D. Das, Bull. Bot. Surv. India 5 : 42. 1963. *Uluvendam* (Tamil).

Spreading shrubs, 1.5-2.5 m high ; branches subpilose. Leaves 4.5-9 x 2-4 cm, elliptic, coriaceous, glabrous above, slightly pilose on the midrib beneath, acuminate at apex, acute at base, boldly reticulately veined ; petioles up to 0.5 cm long, thick. Flowers greenish, solitary, axillary. Carpels \pm 0.5 cm long, ovoid.

Fl. & Fr. : March—February.

Rare in the outskirts of the reserve forests on the way to Five falls.

3. *Polyalthia suberosa* (Roxb.) Thw., Enum. Pl. Zeyl. 398. 1864 ; Bedd., Ic. Pl. Ind. Or. t. 56. 1870 ; Sinclair, Gard. Bull. Singapore 14 : 298. 1955 ; Sant. et Wagh, Bull. Bot. Surv. India 5 : 108. 1963. *Uvaria suberosa* Roxb., Pl. Corom. 1 : t. 34. 1795 & Fl. Ind. 2 : 567. 1832. *Polyalthia suberosa* Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 65. 1872 ; King Ann. R. Bot. Gard. Calcutta 4 : 64, t. 77B. 1893 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 16. 1915 ; D. Das, Bull. Bot. Surv. India 5 : 43. 1963. *Guatteria suberosa* DC., Prodr. 1 : 93. 1824 ; Wt. et Arn., Prodr. 10. 1834.

Shrubs or small trees, 3-5 m high ; young branches glabrous, often white-spotted. Leaves 2.5-8 x 1.8-4 cm, oblong, glabrous above, puberulous beneath, rounded or obtuse at apex, obtuse at base ; side nerves spreading ; petioles 0.3-0.4 cm long, glabrous. Flowers yellowish-green, fragrant in axillary or extra-axillary simple umbels. Carpels upto 0.7 cm long, subglobose, slightly pubescent, reddish when ripe.

Fl. & Fr. : March—January.

Fairly common around Main falls and along the outskirts of the forests on the way to Five falls.

2. MYRISTICACEAE

KNEMA Lour.

Knema attenuata (Hook. f. et Thoms.) Warb., Mon. Myrist. 590, 1897 (incl. var. *latifrons* Warb. loc. cit.); Gamble, Fl. Presid. Madras 2 (7) : 1215, 1925; Sinclair, Gard. Bull. Singapore 18 : 166, f. 2, 1961. *Myristica attenuata* Hook. f. et Thoms., Fl. Ind. 157, 1855 & Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 110, 1886; King, Ann. R. Bot. Gard. Calcutta 3 : 316, pl. 152, 1891. *M. corticosa* (Lour.) Hook. f. et Thoms. *sensu* Bedd Fl. Sylvat. 2 : 271, pl. 271, 1872.

Medium sized trees with flaking bark; young branches rusty-furfuraceous-tomentose. Leaves up to 22.5 x 8.5 cm, elliptic-lanceate or elliptic-oblong, entire, glabrous above, glaucous beneath, acuminate at apex, acute or rounded at base; petioles 1-1.5 cm long, thick, tomentose. Male flowers in umbels at the ends of short (0.4 cm) woody peduncle, subcampanulate or ovoid, 0.4-0.5 cm long, rusty-lanose outside with dendroid-like hairs.

Fl. : January.

Courtallum (Robert Wight 873, 1075, CAL).

3. LAURACEAE

- 1a. Flowers hermaphrodite in cymes or panicles; perfect stamens 9, anthers extrorse; bark aromatic

Cinnamomum 1

- 1b. Flowers dioecious in umbellules arranged in clusters or racemes; perfect stamens 6, anthers introrse; bark not aromatic

Neolitsea 2

1. CINNAMOMUM SCHAEFF. *nom. gen. cons.*

- 1a. Inflorescence of 2-4 flowers, peduncles feebly branched or unbranched, stout; perianth lobes obtuse or obscure and feebly lobed

C. verum 2

- 1b. Inflorescence of many flowers, peduncles much branched, filiform; perianth lobes lanceate, narrow

C. macrocarpum 1

1. *Cinnamomum macrocarpum* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 133, 1886; Gamble, Fl. Presid. Madras 2 (7) : 1225, 1925. *C. iners* auct.

non. Bl. (1826) ; Wt., Ic. t. 122, 130, 1839 ; Gamble Fl. Presid. Madras 2 (7) : 1224, 1925. *Illavangam*, *Karuva*, *Tamala* (Malayalam). *Cirunagappu*, *Periya lavangapatai* (Tamil).

Evergreen trees, 3-8 m high ; branches straight, slender, glabrous ; bark aromatic. Leaves 10-15 x 4-7 cm, elliptic-ovate or ovate-lanceate, coriaceous, glabrous, obtusely acuminate at apex, acute and 3-ribbed from or little above the base ; petioles 3-5.5 cm long. Flowers in subterminal panicles shorter than the leaves. Berries \pm 2 cm long, oblong, fleshy, seated on the thickened cup of the pedicel.

Fl. & Fr. January--November.

Rare at the highest altitudes of Tekkumalai along the sides of the stream and also along the slopes of Kailasa mottai facing Tekkumalai valley.

2. *Cinnamomum verum* J. S. Persl, Rostl. 2 : 36, 1825 ; Kosterm., Reinwardtia 7 : 141, 1965. *C. zeylanicum* Bl. Bijdr. 568, 1825 ; Wt., Ic. t. 123, 1839 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 131, 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1224, 1925 ; Gomerloher, Bull. Jard. Bot. Buitenz. 3, 7 : 458, 1925. *Cheriyalavangam*, *Erikkolam*, *Illavangam*, *Karuva* (Malayalam). *Canalavangapattai*, *Illavangam*, *Lavanga*, *Karuva* (Tamil).

Trees, 5-8 m high ; bark aromatic. Leaves 3.5-9 x 1.5-4.5 cm, ovate, elliptic-ovate, or ovate-lanceate, coriaceous, shiny above, pale beneath, obtuse or obtusely acuminate at apex, obtuse or rounded at base. Flowers greenish-white fragrant, in axillary or terminal few flowered cymose panicles. Berries \pm 1.5 x 0.8 cm, oblong, dark-purple, seated on the persistent perianth.

Fl. : April--July.

The 'cinnamon' tree, very rare at Five falls in the dry reddish soil.

2. NEOLITSEA (Benth.) Merr. *nom. gen. cons.*

Neolitsea cassia (Linn.) Kosterm., J. Sci. Res. Indonesia 1 : 85, 1952. *Laurus cassia* Linn., Sp. Pl. 369, 1753. *Neolitsea zeylanica* (Nees) Merr., Philipp. J. Sci. Bot. Suppl. 1 (1) : 57, 1906 ; Gamble, Fl. Presid. Madras 2 (7) : 1230, 1925 ; Allen, Ann. Mo. Bot. Gard. 25 : 427, 1938. *Litsea*

zeylanica Nees, Amoen. Bot. Bonn. Fasc. 1 : 58, t. 5. 1823 ; Wt., Ic. t. 132. 1839 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 178. 1886 (*pro parte*). *Varan-gam* (Malayalam). *Cenpakapalai*, *Pancattai* (Tamil).

Large trees, 6-15 m high ; branches glabrous. Leaves 4-8.5 x 2-4.2 cm, elliptic or elliptic-lanceate, subcoriaceous, glabrous above, glaucous beneath, obtuse or shortly obtuse-acuminate at apex, narrowed at base. Flowers greenish-white in 3-7 flowered umbellules in the axils of upper leaves. Berries 0.7-0.9 cm across, oblong, seated on the perianth-lobes.

Fl. & Fr. : March—September.

Evergreen trees along the sides of the river Chittar in Tekkumalai.

4. CHLORANTHACEAE

SARCANDRA Gardner

Sarcandra chloranthoides Gardner, Calcutta J. Nat. Hist. 6 : 348. 1846 ; Wt., Ic. t. 1946. 1853 ; Verdcourt, Kew Bull. 39 : 66. 1985. *Chloranthus grandifolius* Miq. Fl. Ind. Bat. 1 (1) : 802. 1856 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 100. 1886. *C. brachystachys sensu* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 100. 1886 (*pro parte*) ; Gamble, Fl. Presid. Madras. 2 (7) : 1211. 1925 (*non* Bl. 1829). *S. irvinbaileyi* Swamy, Proc. Natn. Sci. India B, 19 : 303. 1953. *S. grandifolia* (Miq.) Subr. et Henry, Bull. Bot. Surv. India 12 : 5. 1970.

Shrubs ; stem articulate at nodes, glabrous. Leaves 8-19 x 3.5-8.5 cm, elliptic-ovate or oblanceate, coarsely spinous-serrate, glabrous or nearly so, acuminate at apex, cuneate at base. Flowers in terminal glabrous panicle spikes. Drupes 0.3-0.4 cm across, subglobose.

Fl. : August.

Courtallum (*Robert Wight* 878, CAL).

5. PIPERACEAE

1a. Climbing shrubs ; spikes solitary

Piper 3

1b. Erect or decumbent herbs, spikes solitary, panicled or umbellate

- | | |
|--|---------------------|
| 2a. Leaves 1 - 2.5 cm long, elliptic ; spikes solitary or panicle | <i>Peperomia</i> 2 |
| 2b. Leaves 12 - 40 cm long, orbicular - cordate ; spikes 3 - 7 in umbels | <i>Lepianthes</i> 1 |

1. LEPIANTHES Raf.

Lepianthes umbellata (Linn.) Raf., Sylva Tellur. 84. 1838. *Piper umbellatum* Linn., Sp. Pl. 30. 1753. *P. subpeltatum* Willd., Sp. Pl. 1 : 166. 1797 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 95. 1886. *Heckeria subpeltata* (Willd.) Kunth, Linnaea 13 : 571. 1839 ; Gamble, Fl. Presid. Madras 2 (7) : 1208. 1925. *Pothomorphe subpeltata* (Willd.) Miq., Comment. Phytogr. 37. 1840 & Syst. Piper. 213. 1843 ; Wt., Ic. t. 1925. 1853 ; Henry et Bela Roy, Bull. Bot. Surv. India 10 : 275. 1968.

Perennial erect herbs, 1 - 1.5 m high ; branches jointed, succulent. Leaves 10 - 40 cm in diameter, orbicular, softly acuminate at apex, deeply cordate with a narrow sinus at base ; petioles 10 - 20 cm long, striated. Flowers greenish white in axillary, subumbellate, slender, cylindric spikes (3 - 7 together).

Fl. & Fr. : July - March.

Rare in the deeply shaded areas of Tekkumalai along the sides of the stream.

2. PEPEROMIA Ruiz et Pav.

Peperomia dindigulensis Miq., Syst. Piper. 122. 1843 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 98. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1210. 1925. *P. heyneana sensu* Wt., Ic. t. 1922 (1). 1853 (*non* Miq. 1843).

Erect or decumbent herbs, 10 - 15 cm high ; stem rooting at lower nodes. Leaves 1.5 - 2.5 x 0.5 - 1.5 cm, elliptic, elliptic ovate or slightly obovate, subfleshy, entire, glabrous above, slightly pubescent and pale beneath, rounded or obtuse at apex, acute or cuneate at base ; petioles 0.5 - 1 cm long. Spikes greenish, slender, solitary or in paniculate groups towards the apex of branches, up to 6.5 cm long. Nutlets globose, punctate.

Fl. & Fr. : July - November.

Fairly common in Tekkumalai, as epiphytic on rocks.

3. PIPER Linn.

Piper trioicum Roxb., Fl. Ind. 1 : 151. 1820 ; Wt., Ic. tt. 1935, 1936. 1853 ; Subr. et Henry, Bull. Bot. Surv. India 12 : 14. 1972. *P. attenuatum* Buch. Ham. ex Miq., Syst. Piper. 306. 1843 ; Wt., Ic. t. 1933. 1853 ; Hook. f. in Hook. f., Fl. Brit Ind. 5 : 92. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1207. 1925. *Kattukurumulaku* (Malayalam). *Kattumilagu* (Tamil).

Climbing shrubs ; branches green, glabrous, often zig zag. Leaves 6 10.5 x 3 6.5 cm, elliptic - lanceate or orbicular ovate, membranous, acuminate at apex, rounded or oblique at base ; petioles 1 1.5 cm long. Flowers greenish yellow in solitary spikes up to 12 cm long. Berries \pm 0.3 cm in diameter, globose, green when young.

Fl. & Fr. : July - October.

Common in Udayathan estate, around Swamiar falls and in Tekkumalai.

6. ARISTOLOCHIACEAE

- | | |
|---|-----------------------|
| 1a. Erect shrubs ; perianth regular, equally 3 - lobed | <i>Apama</i> 1 |
| 1b. Trailing or climbing herbs or shrubs ; perianth inflated at base, lower limb 2 - lipped | <i>Aristolochia</i> 2 |

1. APAMA Lamk.

Apama siliguosa Lamk., Enc. Meth. Bot. 1 : 91. 1783 ; Gamble, Fl. Presid. Madras 2 (7) : 1200. 1925 ; Schmidt, in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b : 234. 1935. *Bragantia wallichii* R. Br. ex Wt. et Arn., Edinb. New Phil. J. : 181. 1833 ; Wt., Ic. t. 520. 1842 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 73. 1886.

Erect shrubs, up to 1 m high, stems angled, jointed, glabrous. Leaves 6.5—22.5 x 1.5—4.5 cm, oblong lanceate, glabrous above, minutely pubescent beneath, long acuminate at apex, acute at base ; petioles 0.5—1 cm long. Flowers yellowish green, axillary, solitary or in small irregular cymes ; pedicels 1—1.2 cm long, slender, hairy. Capsules 0.4—1 cm long, 4—gonous, straight, minutely pubescent.

Fl. & Fr. : July - December.

Rare in the highest altitudes of Tekkumalai towards the side of Kailasaparvatham.

2. ARISTOLOCHIA Linn.

- | | |
|--|-------------------------|
| 1a. Slender prostrate herbs ; leaves reniform | <i>A. bracteolata</i> 1 |
| 1b. Climbing shrubs or undershrubs ; leaves ovate, oblong or oblong - lanceate | |
| 2a. Leaves truncate or subcordate at base | <i>A. indica</i> 2 |
| 2b. Leaves deeply cordate at base | <i>A. tagala</i> 3 |

1. *Aristolochia bracteolata* Lamk., Enc. Meth. Bot. 1 : 258. 1783 ; Sant. et Wagh, Bull. Bot. Surv. India 5 : 105. 1963. *A. bracteata* Retz., Obs. Bot. 5 : 29. 1789 ; Hook. f. in Hook. f., Fl. Ind. 5 : 75. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1201. 1925 ; Schmidt. in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b : 240. 1935 ; Bor & Raizada, J. Bombay Nat. Hist. Soc. 41 : 218. 1939.

Slender, prostrate herbs, 30—45 cm long ; stem grooved, glabrous. Leaves 3.5—4 cm long, reniform or broadly ovate, glabrous above, glaucous beneath, rounded at apex, cordate at base with a shallow sinus ; petioles 1—2.5 cm long. Flowers greenish with a purple lip, solitary, axillary, 3—3.5 cm long. Capsules \pm 2 cm long, ellipsoid, 12 ribbed.

Fl. & Fr. : September - December.

Courtallum (Robert Wight 886, CAL).

2. *Aristolochia indica* Linn., Sp. Pl. 960. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 75. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1202. 1925 ; Schmidt. in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b : 241. 1835. *Katalivegam*, *Perumarunnu* (Malayalam). *Adagam*, *Carcugadi*, *Kodi* (Tamil).

Twining glabrous herbs or undershrubs ; stem faintly grooved, greenish. Leaves 5—8.5 \times 1.5—5 cm, variable in shape from lanceate to oblong - lanceate, membranous, truncate to subcordate at base, acuminate at apex ; petioles 1—1.5 cm long, straight. Flowers greenish - yellow, 2—4.5 cm long, in axillary, slender racemes. Capsules 3—3.5 cm long, globose oblong, ribbed, glabrous.

Fl. & Fr. : September - March.

Fairly common in the outskirts of the forests on the way to Five falls.

3. *Aristolochia tagala* Cham., *Linnaea* 7 : 207, t. 5, f. 3. 1832 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1201. 1925 ; Schmidt. in Engl. & Prantl, *Pflanzenfam.* (ed. 2) 16b : 241. 1935. *A. acuminata* Roxb., *Fl. Ind.* 3 : 489. 1832 (*non* Lamk.) ; Wt., *Ic. t.* 771. 1844. *A. roxburghiana* Klotzsch, *Monatsb. Berl. Akad.* 696. 1859 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 75. 1886.

Glabrous twining shrubs ; stem grooved. Leaves 10—20 × 3.5—10.5 cm, ovate or ovate oblong, entire or irregular on the margins, acute or acuminate at apex, cordate at base with a narrow sinus ; upper leaves sagittately lanceate ; petioles 2—5 cm long, twining. Flowers greenish yellow in lax, axillary puberulous racemes ; (most of the flowers abortive, only one fertile) ; perianth tube curved. Capsules 2—3.5 cm long, globose, pyriform or oblong - ellipsoid, glabrous ; seeds winged.

Fl. & Fr. : September - March.

Rather common, along with hedge plants in the drier areas of Courtallum i.e. Tekkumalai, Five falls and Chittaruvi area.

7. NYMPHAEACEAE

NYMPHAEA Linn. *emend.* J. E. Smith. *nom. gen. cons.*

Nymphaea pubescens Willd., *Sp. Pl.* 2 : 1154. 1797 ; Wt. *et* Arn., *Prodr.* 17. 1834 ; Dunn in Gamble, *Fl. Presid. Madras* 1 (1) : 34. 1915 ; van Royen, *Nova Guinea (Bot.)* 10 (8) : 107. 1962. *N. lotus* auct. (*non* Linn.) Roxb., (*Hort. Beng.* 14. 1814 *nom. nud.*) *Fl. Ind.* 2 : 577. 1832. *N. lotus* Linn. var. *pubescens* (Willd.) Hook. f. *et* Thoms., *Fl. Ind.* 1 : 241. 1855 & in Hook. f., *Fl. Brit. Ind.* 1 : 114. 1872. *N. nouchali* auct. (*non* Burm. f.) Merr., *Philip. J. Sci.* 19 : 350. 1921 ; Subr., *Aquat. Angio.* 6. 1962.

Aquatic, floating herbs with rhizomes, $\pm 3 \times 2$ cm, ovoid. Leaves peltate or subpeltate, 15 — 20 × 15 — 25 cm, ovate, elliptic or suborbicular, glabrous or finely punctate above, tomentose below, coarsely dentate along the margins, subacute or obtuse or rounded at apex, sagitate or cordate at base ; main veins 5 — 8 pairs ; petioles terete, 0.2 — 0.7 cm across, pubescent. Flowers rose coloured to creamy white, extra-axillary, solitary on long scapes. Berries ± 3 cm across, globose, fleshy with remnants of stamens and stigmas.

Fl. : Almost throughout the year.

Common in the still ponds on the way to Five falls.

8. RANUNCULACEAE

NARAVELIA Adans. *nom. gen. cons.*

Naravelia zeylanica (Linn.) A. DC., Syst. 1 : 167. 1817 ; Wt. et Arn. Prodr. 2. 1834 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 7. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 3. 1915. *Astragen zeylanica* Linn., Sp. Pl. 542. 1753 ; Roxb., Pl. Corom. 2 : t. 188. 1805. *Clematis zeylanica* (Linn.) Poir. in Lamk., Enc. Meth. Bot. 2 : 296. 1819 ; Prantl in Engl. & Prantl, Pflanzenfam. (ed. 1) 3, 2 : 64. 1891.

Tendrils climbing shrubs, 3 — 4 m high. Leaves trifoliate, the terminal leaflet often transformed into branched tendrils ; leaflets 6.5 — 11.5 × 2.5 — 7.5 cm, ovate, entire, glabrous above, prominently reticulated and pubescent along the nerves beneath, acute or shortly acuminate at apex, rounded at base. Flowers light yellow in axillary or terminal pubescent panicles ; sepals 4 — 5, ovate lanceate, downy. Achenes 0.8 — 1.2 cm long, linear, stalked with a long pilose tail formed by the persistent style.

Fl. & Fr. : October — February.

Rare, in the outskirts of the dry forests on the way to Five falls.

9. MENISPERMACEAE

- | | |
|---|----------------------|
| 1a. Stamens united into a peltate synandrium | |
| 2a. Carpels solitary ; slender climbers | |
| 3a. Male inflorescence of one or more axillary subcorymbose cymes ; female inflorescence bearing large orbicular bracts | <i>Cissampelos</i> 2 |
| 3b. Male and female inflorescence of panicles or pseudoracemes ; bracts of the female inflorescence minute | <i>Cyclea</i> 4 |
| 2b. Carpels three ; large woody climbers | <i>Anamirta</i> 1 |
| 1b. Stamens with filaments free or connate but anthers always free | |
| 4a. Flowers in cymose fascicles along the main axis of the inflorescence | <i>Pachygone</i> 5 |
| 4b. Flowers in axillary pedunculate panicles | |
| 5a. Slender hirsute plants ; stamens 6 - 9 | <i>Cocculus</i> 3 |
| 5b. Woody glabrous plants ; stamens 3 | <i>Tiliacora</i> 6 |

1. ANAMIRTA Colebr.

Anamirta cocculus (Linn.) Wt. et Arn., Prodr. 446. 1834. & Arn., Ann. Sci. Nat. 2 (ser. 2) : 65-69, t. 3. 1834 ; Hook. f. et Thoms., Fl. Ind. 1 : 185. 1855 & in Hook. f., Fl. Brit. Ind. 1 : 98. 1872 ; Diels in Engl., Pflanzenr. 46 : 108, f. 40. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 27. 1915. *Menispermum cocculus* Linn., Sp. Pl. 340. 1753. *Anamirta paniculata* Colebr., Trans. Linn. Soc. Lond. 13 : 52. 1822. *Cocculus suberosus* DC., Prodr. 1 : 97. 1824 ; Wt. et Arn., loc. cit. p. 11. *C. cordifolius* DC., Prodr. 1 : 97. 1824 ; Wt. et Arn., loc. cit. p. 11. *Minispermum heteroclitum* Roxb., Fl. Ind. 3 : 817. 1832.

Large, woody, climbing shrubs, 20-30 cm high. Leaves 13-15.5 x 12.5-14.5 cm, broadly-ovate, entire, glabrous above, tufted hairy along the principal nerve axis beneath, acute or shortly acuminate at apex, cordate or subcordate at base ; petioles 9.5-13 cm long, striated, enlarged at both ends. Flowers yellowish in drooping panicles from old stems. Drupes \pm 1 cm in diameter, globose.

Fl. & Fr. : September — February.

Rare in the Five falls area with their main stem lodged on rocks.

2. CISSAMPELOS Linn.

Cissampelos pareira Linn., Sp. Pl. 1031. 1753 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 103. 1872 ; Diels in Engl., Pflanzenr. 46. 286. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 30. 1915 ; Forman, Kew Bull. 22 : 356. 1968. *C. convolvulacea* Willd., Sp. Pl. 4 : 833. 1805 ; Wt. et Arn., Prodr. 14. 1834. *Kattuvalli*, *Pattuvalli* (Malayalam). *Appata*, *Cina*, *Ponmaititta* (Tamil).

Slender, twining undershrubs, 2-3 m high ; stems wiry, pubescent, striated. Leaves 2.5-5 x 2-5 cm, entire, pubescent (more on the lower surface) on both sides, rounded, obtuse or acuminate at apex, cordate at base ; petioles 3-5.5 cm long, pubescent. Flowers pale white or greenish yellow, dioecious ; male flowers in axillary subcorymbose cymes ; female flowers in racemes with greenish, foliaceous, orbicular bracts. Drupes 0.3-0.4 cm long, ovoid, scarlet when ripe.

Fl. & Fr. : July — September.

Common above Five falls, Tekkumalai and above Chittaruvi.

3. COCCULUS DC.

Cocculus hirsutus (Linn.) Diels in Engl., Pflanzenr. 46 : 236. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 29. 1915. *Menispermum hirsutum* Linn., Sp. Pl. 341. 1753 ; Roxb., Fl. Ind. 3 : 814. 1832. *Cocculus villosus* (Lamk.) DC., Syst. 1 : 525. 1818 & Prodr. 1 : 98. 1824 ; Wt. et Arn., Prodr. 13. 1834 ; Hook. f. et Thoms., Fl. Ind. 1 : 193. 1855 & in Hook. f., Fl. Brit. Ind. 1 : 101. 1872. *Menispermum villosum* Lamk., Dict. 4 : 97. 1797.

Climbing undershrubs ; stem and branches hirsute. Leaves 2.5 x 0.8-2.5 cm, ovate or oblanceate, entire, softly pubescent or villous on both sides, obtuse and mucronate at apex, truncate or subcordate at base ; petioles up to 1 cm long, pubescent. Flowers in villous axillary pedunculate panicles, towards the apex of branches.

Fl. : April.

Courtallum (Collector ? s.n. Acc. No. 971, MH)

4. CYCLEA Arn. et Wt.

Cyclea peltata (Lamk.) Hook. f. et Thoms., Fl. Ind. 1 : 201. 1855 (*quod basionym*) ; Diels in Engl., Pflanzenr. 46 : 312. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 31. 1915 ; Sant. et Janardhanan, Bull. Bot. Surv. India 10 : 368. 1968. *Menispermum peltatum* Lamk., Enc. Meth. Bot. 4 : 96. 1797. *Cyclea burmanni* (DC.) Hook. f., et Thoms., Fl. Ind. 1 : 201. 1855 & in Hook. f., Fl. Brit. Ind. 1 : 104. 1872 ; Miers, Contrib. Bot. 3 : 239, pl. 121. 1871. *Cocculus burmanni* DC., Syst. 1 : 517. 1818 & Prodr. 1 : 96. 1824.

Twining undershrubs, 2-5 m high ; stems glabrous. Leaves peltate, 6.5-12.5 x 4-9 cm, almost triangular, entire, glabrous and shiny above, pubescent beneath, acuminate or shortly mucronate at apex, subcordate at base ; petioles 3-4.5 cm long, longitudinally striated, pubescent. Flowers dioecious in axillary pseudoracemes or panicles ; anthers 6-8 loculed. Drupes 0.3-0.4 cm in diameter, subglobose, wrinkled.

Fl & Fr. : September-December.

Rare, in the shola forest above Karuppuswamy kovil and on the way to Vaithamalai.

5. PACHYGONE Miers

Pachygone ovata (Poir.) Miers ex Hook. f. et Thoms., Fl. Ind. 1 : 203. 1855 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 105. 1872 ; Diels in Engl., Pflanzenr. 46 : 243. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 31. 1915 ; Forman, Kew Bull. 1957 : 357. 1957 *Cissampelos ovata* Poir. in Lamk., Enc. Meth. Bot. 5 : 10. 1804. *Pachygone plukenetii* DC., Syst. 1 : 520. 1818 & in Prodr. 1 : 97. 1824 ; Wt. et Arn., Prodr. 14. 1834 ; Wt., Ic. t. 824, 825. 1844.

Climbing shrubs, 2-3 m high ; branches slender, pubescent. Leaves 3.5-6.5 x 1.5-2.5 cm, ovate, coriaceous, glabrous above, hairy along the nerves beneath, obtuse at apex, acute at base ; petioles 1.5-2 cm long, slender, pubescent. Flowers greenish in cymose fascicles along the main axis of the inflorescence. Drupes ± 0.7 cm long, reniform with a sub-basal style-scar.

Fl. & Fr. : January—May.

Rare, in the outskirts of the forest on the way to old Courtallum.

6. TILIACORA Colebr.

Tiliacora acuminata (Lamk.) Miers, Tayl. Ann. (ser. 2) 6 : 39 1851 ; Diels in Engl., Pflanzenr. 46 : 60. 1910 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 26. 1915 ; Forman, Kew Bull. 30 : 90. 1975. *Menispermum acuminatum* Lamk., Enc. Meth. Bot. 4 : 101. 1797. *Tiliacora racemosa* Colebr., Trans. Linn. Soc. Lond. 5 : 13. 1821 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 99. 1872. *Menispermum polycarpon* Roxb., Fl. Ind. 3 : 816. 1832.

Large climbing shrubs, 3-6 m high. Leaves 5-14 x 2.5-7.5 cm, oblong-ovate, shiny above, paler beneath, wavy, acuminate at apex, rounded or ovate at base ; petioles 1.2-1.8 cm long. Flowers yellow, dioecious or polygamous in lax axillary panicles ; male flowers 2-7 at the apex of the inflorescence ; female flowers solitary. Drupes 1—1.5 cm long, oblong.

Fl. & Fr. : June—September.

Courtallum (C. A. Barber 3266, 3247, CAL).

10. SABIACEAE

MELIOSMA BL.

Meliosma simplicifolia (Roxb.) Walp., Rep. 1 : 423. 1842 ; Hook. f. in Hook. f., Fl. Brit. Ind. 2 : 5. 1876 ; Warb. in Engl. & Prantl, Pflanzenfam. (ed. 1) 3, 4 : 373. 1897 ; Gamble, Fl. Presid. Madras 1 (2) : 256. 1918 ; How, Acta Phytotax. Sin. 3 : 428. 1955 ; Beusekom, Blumea 19 : 462. 1971. *Millingtonia simplicifolia* Roxb., Pl. Corom. 3 : 50, t. 254. 1820 & in Fl. Ind. 1 : 103. 1820 ; Wt. et Arn., Prodr. 115. 1834. *Kallavi*, *Kuccavir* (Malayalam). *Cembaru*, *Kallavi* (Tamil).

Small trees, 4-6 m high ; branchlets pubescent. Leaves 15-28 x 5.5-11 cm, oblong-lanceate, membranous, entire, glabrous, lateral nerves incurved and confluent near the margins, shortly and obtusely acuminate at apex, much attenuated at base ; petioles 2-2.5 cm long, puberulous. Flowers brownish with a light smell, in terminal pubescent panicles. Drupes small, subglobose.

Fl. & Fr. : August—April.

Rare along the sides of the stream above Five falls.

11. ULMACEAE

1a. Flowers polygamous ; perianth lobes imbricate

Celtis 1

1b. Flowers dioecious ; perianth lobes induplicate valvate
or subimbricate

Trema 2

1. CELTIS Linn.

Celtis cinnamomea Lindl. ex Planch., Ann. Sci. Nat. (ser. 4) 10 : 303. 1848 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 482. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1349. 1928. *C. wightii* Planch., Ann. Sci. Nat. (ser. 4) 10 : 307. 1848 ; Wt., Ic. t. 1969. 1853 ; Hook. f., loc. cit. p. 483 ; Fischer loc. cit. ; Polhill, Kew Bull. 19 : 141. 1964. *Putan*, *Putanonmatu*, *Butha* (Malayalam). *Pinari*, *Kalluviri*, *Kodalimuriki* (Tamil).

Trees, 5-6 m high ; stem and branches glabrous. Leaves 3.5-8 x 1.8-3.5 cm, oblong-lanceate to elliptic-lanceate, chartaceous, entire, glabrous or minutely pubescent along the nerves, acuminate at apex, acute or cuneate and unequal at base. Flowers whitish in short axillary few flowered, grey pubescent cymes. Drupes ovoid, green.

Fl. & Fr. : April September.

Rare in the reserve forest between Shembagadevi and Tiger falls.

2. TREMA Lour.

Trema orientalis (Linn.) Bl., Mus. Bot. Lugd. Bat. 2 : 62. 1856 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 484. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1350. 1928 ; Polhill, Kew Bull. 19 : 141. 1964. *Celtis orientalis* Linn., Sp. Pl. 1044. 1753. *Malantotali*, *Ratthi*, *Arni*, *Amathali*, *Pottami* (Malayalam). *Ambaratti*, *Oman*, *Vendai*, *Kuripala*, *Mudalai* (Tamil).

Trees, 4-8 m high ; bark reddish grey, pubescent. Leaves 3.5 — 9 × 3 — 5.5 cm, ovate lanceate, serrate, hairy or pubescent on both sides, acuminate at apex, rounded at base ; petioles 1 — 1.5 cm long. Flowers greenish in axillary cymes. Drupes ovoid or subglobose, tipped by the style at apex.

Fl. & Fr. : August May.

Common around old Courtallum falls and along the forest path sides to Kulirati.

12. MORACEAE

- | | |
|---|--------------------|
| 1a. Herbs ; inflorescence discoid with marginal tentacles | <i>Dorstenia</i> 1 |
| 1b. Shrubs or trees ; inflorescence not discoid | |
| 2a. Flowers in syconia ; plants unarmed | <i>Ficus</i> 2 |
| 2b. Flowers exposed (not in syconia) ; plants often armed | <i>Streblus</i> 3 |

1. DORSTENIA Linn.

Dorstenia indica Wt., Ic. t. 1964. 1853 ; Bureau in DC., Prodr. 17 : 272. 1873 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 494. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1370. 1928.

Succulent herbs, 30-60 cm high ; stem creeping and rooting at base, mostly unbranched with young parts shortly white hairy. Leaves 3.5 — 8 × 2 — 3.5 cm, elliptic or sub lanceate, membranous, entire, dentate or sinuate, subacute at apex, cuneate at base ; petioles 1.5 — 3 cm long,

slender. Flowers monoecious in solitary, axillary, simple or lobed receptacles; male flowers numerous, very small; female flowers immersed in the disc, opening before the male. Achenes minute.

Fl. : June August.

Courtallum (*Robert Wight 851, CAL*).

2. *FICUS* Linn.

- 1a. Receptacles sessile or shortly (0.2 - 0.5 cm) peduncled
 - 2a. Pillar roots absent from the branches
 - 3a. Plants with white or ferruginous innovations *F. mollis* 5
 - 3b. Plants fully glabrous
 - 4a. Petioles more than 3.5 cm long; leaves abruptly or caudately acuminate at apex
 - 5a. Leaves cordate at base; lateral nerves 5 - 7 pairs *F. arnottiana* 1
 - 5b. Leaves obtuse or rounded at base; lateral nerves 8 - 14 pairs *F. tsjakela* 8
 - 4b. Petioles less than 2 cm long; leaves obtuse, sub - acuminate or apiculate at apex
 - 6a. Veins of the leaves with intercostals; leaves obovate or broadly-ovate, not 3 - ribbed at base *F. retusa* 7
 - 6b. Veins of the leaves without intercostals or with 1 or 2 vague ones; leaves ovate rhomboid or elliptic, 3 - ribbed at base *F. benamina* 3
 - 2b. Pillar roots developing from the branches *F. benghalensis* 2
- 1b. Receptacles long peduncled
 - 7a. Leaves smooth, glabrous; receptacles white tomentose *F. racemosa* 6
 - 7b. Leaves very rough, hairy on both sides; receptacles with stiff grey hairs *F. hispida* 4

1. *Ficus arnottiana* Miq., Ann. Mus. Lugd. Bat. 3 : 287. 1867; King, Ann. R. Bot. Gard. Calcutta 1 : 56. pl. 68. 1887; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 513. 1888; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1363. 1928; Corner, Gard. Bull. Singapore 21 (1) : 11. 1965. *Urostigma*

arnottianum Miq. in Hook., J. Bot. 6 : 564. 1847. *U. courtallense* Miq., ibid. 6 : 564. 1847. *Ficus arnottiana* Miq. var. *courtallensis* (Miq.) Miq., Ann. Mus. Lugd. Bat. 3 : 287. 1867 ; King, loc. cit. pl. 68 B. *Amakannian*, *Kallarayal* (Malayalam). *Kagoli*, *Kodiyaraku*, *Kallaracu* (Tamil).

Shrubs or small trees, 2 — 6 m high ; bark grey brown ; serial roots absent. Leaves 6 — 14 × 4 — 9.5 cm, broadly ovate, subcoriaceous, acuminate at apex, deeply cordate at base ; petioles 3.5 — 10 cm long, slender. Receptacles green with reddish spots, solitary or in pairs, axillary, 0.2 — 0.5 cm long peduncled, 0.4 — 0.8 cm in diameter, depressed globose, glabrous. Figs purple dotted when ripe.

Fl. & Fr. : June — September.

Common in the open forest near Main falls and Tiger falls.

2. *Ficus benghalensis* Linn., Sp. Pl. 1059. 1753 ; King, Ann. R. Bot. Gard. Calcutta 1 : 18, pl. 13. 1887 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 499. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1361. 1928 ; Corner, Gard. Bull. Singapore 21 (1) : 14. 1965. *F. indica* Linn., Sp. Pl. 1060. 1753 (*non sensu* King). *Urostigma benghalensis* (Linn.) Gasp., Nov. Gen. f. 7. 1844 ; Wt., Ic. t. 1989. 1853. *Aal*, *Peral*, *Vatam* (Malayalam). *Al*, *Alam*, *Eguvaccan*, *Kaddam*, *Koli*, *Arala* (Tamil).

Large spreading trees, 15 — 20 m high ; branches hairy when young, horizontal or descending with aerial columnar roots. Leaves 1 — 25 × 6 — 13 cm, ovate or ovate oblong, coriaceous, glabrous above, hairy beneath, obtuse at apex, subcordate at base ; petioles 0.5 — 2 cm long, hairy. Receptacles in pairs, 1.5 — 2 cm in diameter, globose, puberulous. Figs orange red when ripe.

Fl. & Fr. : August — December.

The large banyan, grown as shade trees along road sides in Courtallum.

3. *Ficus benjamina* Linn., Mant. 129. 1767 ; King, Ann. R. Bot. Gard. Calcutta 1 : 43, pl. 52. 1887 ; Corner, Gard. Bull. Singapore 21 (1) : 21. 1965. *F. nitida* Thumb., Diss. Ficus 14. 1786 ; Wt., Ic. t. 642. 1840. *F. retusa* Linn. var. *nitida* (Thumb.) Miq., Ann. Mus. Lugd. Bat. 3 : 267. 1867 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 511. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1362. 1928. *Vellal* (Malayalam). *Malayathi* (Tamil).

Large shrubs or small trees, 3–6 m high; bark grey, smooth; aerial roots absent. Leaves 5–11.5 × 2–5.5 cm, ovate-rhomboid or elliptic, thinly coriaceous, apiculate at apex, narrowed towards base; nerves raised on both sides; petioles 0.3–0.8 cm long. Receptacles greenish in axillary pairs, 0.4–0.7 cm in diameter, pyriform, sessile. Figs smooth, yellowish when ripe.

Fl. & Fr. : February–May.

Common in the outskirts at Main falls and on the way to Five falls.

4. *Ficus hispida* Linn. f., Suppl. 442. 1781; King, Ann. R. Bot. Gard. Calcutta 2 : 116, pl. 154, 155. 1888; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 522. 1888; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1367. 1928; Corner, Gard. Bull. Singapore 21 (1) : 89. 1965. *F. oppositifolia* Roxb., Pl. Corom. 2 : 14, t. 124. 1798; Wt., Ic. t. 638. 1840. *F. daemonum* Koen. ex Vahl, Enum. 2 : 198. 1806. *Erumanakku*, *Parakam*, *Parom*, *Peyetti* (Malayalam). *Connatti*, *Peyatti*, *Chona atti*, *Polla parakam* (Tamil).

Trees, 5–12 m high; branches hollow, hairy; aerial roots absent. Leaves 12–25 × 2–14 cm, ovate-oblong, coriaceous, hispid on both sides, dentate, acute at apex, subcordate at base; petioles 3–5 cm long, hairy. Receptacles green in cauliflorous clusters, obovoid, 1–2.5 cm long, covered with stiff, grey hairs.

Fl. & Fr. : April–July.

Common stunted trees around Main falls.

5. *Ficus mollis* Vahl, Symb. Bot. 1 : 82. 1790; King, Ann. R. Bot. Gard. Calcutta 1 : 22, pl. 18. 1887; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 501. 1888; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1361. 1928. *Kallal* (Malayalam). *Kalatti*, *Karbadi*, *Ichachi*, *Kal - Ichachi* (Tamil).

Trees, 4–8 m high; branches with white or ferruginous innovations, often without aerial roots. Leaves 5.5–12.5 × 2.5–7 cm, ovate-elliptic or obovate, glabrous above, densely white to pale ferruginous-tomentose beneath, rounded or bluntly apiculate at apex, ovate or cordate at base; petioles 2–4 cm long, tomentose. Receptacles greenish, sessile, axillary, solitary or paired, 0.5–0.8 cm in diameter, subglobose, tomentose.

Fl. & Fr. : January July.

In the open rocky areas around Tiger falls, Chittaruvi and in the rock hill area above it the trees are common.

6. *Ficus racemosa* Linn., Sp. Pl. 922. 1753 ; Corner, Gard. Bull. Singapore 21 (1) : 34. 1965. *F. glomerata* Roxb., Pl. Corom. 2 : 13, t. 123. 1798 ; Wt., Ic. t. 667. 1843 ; King, Ann. R. Bot. Gard. Calcutta 2 : 173, t. 218, 219. 1888 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 535. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1364. 1928. *Athi*, *Athi - al* (Malayalam). *Athi* (Tamil).

Deciduous trees, 10 - 15 m high ; young branches thinly and appressedly white hairy. Leaves 8 - 20 × 3 - 8 cm, elliptic ovate or oblong - lanceate, glabrous, acute at apex, oblique at base ; petioles 2 - 3 cm long, hairy. Receptacles green, 2 - 3 cm in diameter, ovoid, white tomentose in cauliflorous clusters.

Fl. & Fr. : December March.

Rare in the Chittar valley of Tekkumalai.

7. *Ficus retusa* Linn., Mant. 129. 1767 ; King, Ann. R. Bot. Gard. Calcutta 1 : 50, t. 61. 1887 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 511. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1362. 1928 ; Corner, Gard. Bull. Singapore 21 (1) : 20. 1965. *Illiyal* (Malayalam). *Ponichichi*, *Kal - Ichchi*, *Kal - athi*, *Icci* (Tamil).

Spreading trees, 8 - 12 m high ; branches glabrous, devoid of aerial roots. Leaves compact on twiggy apical branches, 5 - 11 × 4 - 9 cm, broadly ovate or obovate, coriaceous, glabrous, obtuse to acuminate at apex, rounded at base ; petioles 1 - 1.5 cm long, stout, glabrous. Receptacles greenish, in axillary pairs, 0.4 - 0.8 cm in diameter, depressed globose, smooth. Figs brownish when ripe.

Fl. & Fr. : February August.

Rather common in the rocky soil above Chittaruvi and Five falls.

8. *Ficus tsjahela* Burm. f., Fl. Ind. 227. 1768 (*F. tjakela* auct.) ; Wt., Ic. t. 668. 1843 ; King, Ann. R. Bot. Gard. Calcutta 1 : 57, pl. 70. 1887 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 514. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1362. 1928 ; Corner, Gard. Bull. Singapore 21 (1) : 7. 1965. *Kar al*, *Cakkula*, *Cuvannal* (Malayalam). *Karibasari*, *Kattal*, *Karugatti*, *Kuragu* (Tamil).

Deciduous trees, 5—7 m high ; branches glabrous, devoid of aerial roots. Leaves 9—19.5 x 4.5—9.5 cm, ovate elliptic, coriaceous, entire, glossy above, shortly and abruptly acuminate at apex, rounded or obtuse and 3-nerved at base ; petioles 4.5—7.5 cm long, slender. Receptacles 2—6 in the axils of fallen leaves, sessile or subsessile, 0.4—0.6 cm in diameter, globose, glabrous. Figs yellow dotted when ripe.

Fl. & Fr. : June—September.

Common in the lower altitudes of Courtallum.

3. *STREBLUS* Lour.

1a. Plants armed ; leaves smooth

S. taxoides 2

1b. Plants unarmed ; leaves rough

S. asper 1

1. *Streblus asper* Lour., Fl. Cochinch. 615. 1790 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 489. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1353. 1928 ; Corner, Gard. Bull. Singapore 19 : 228. 1962. *Epicarpurus orientalis* Bl., Bijdr. 488. 1825 ; Wt., Ic. t. 1961. 1853. *Parava*, *Paenkeu*, *Timtan paruva* (Malayalam). *Pura*, *Pirasu*, *Kurippiray*, *Kuripilla* (Tamil).

Unarmed shrubs or small trees, 3—6 m high ; branchlets twiggy with short, white or brownish, spreading hairs. Leaves 2.5—8.5 x 1.5—2.8 cm, oblong, ovate scabrid on both sides, serrate, dentate or crenate, acute or subacute and mucronate at apex, narrowed and often slightly asymmetric at base ; petioles 0.5—1 cm long, hairy. Flowers dioecious, axillary ; male flowers in 5—15 flowered capitula, greenish white, fragrant ; female flowers green, solitary at the tip of the peduncle. Drupes 0.4—0.5 cm long, ovoid, exposed at maturity.

Fl. & Fr. : September—March.

Common in the dry outskirts of the forests on the way to Old Courtallum.

2. *Streblus taxoides* (Heyne ex Roth) Kurz, For. Fl. Burma 2 : 465. 1877 ; Corner, Gard. Bull. Singapore 19 : 225. 1962. *Trophis taxoides* Heyne ex Roth, Nov. Sp. Pl. Ind. Or. 368. 1821. *T. spinosa* Roxb., Fl. Ind. 3 : 762. 1832. *Epicarpurus spinosus* (Roxb.) Wt., Ic. t. 1962. 1853 (*partim*). *Phyllochlayms spinosa* (Roxb.) Bureau in DC., Prodr. 17 : 218. 1873 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 488. 1888 ; Fischer in

Gamble, Fl. Presid. Madras 3 (8) : 1452. 1928. *P. wallichii* King in Hook. f., Fl. Brit. Ind. 5 : 489. 1888.

Armed shrubs up to 4 m high ; branches twiggy with woody spines, glabrous or rarely the petioles and underside of the lamina hairy. Leaves $4.5 - 11.5 \times 1.5 - 5$ cm, ovate to obovate, often asymmetric, coarsely serrate, sometimes subentire, smooth, acute to acuminate or tridentate at apex, cuneate at base ; petioles up to 0.4 cm long. Flowers dioecious ; male flowers in axillary capitate clusters of 8-14, sessile except the central pedicellate ones ; female flowers solitary on 0.3-0.6 cm long, scabrid peduncles. Drupes 0.5-1 cm long, ellipsoid, very fleshy at the base.

Fl. & Fr. : August - November.

Scattered in the forest outskirts at Five falls.

13. URTICACEAE

1a. Herbs

- | | |
|---|---------------------|
| 2a. Plants with stinging hairs | <i>Laportea</i> 3 |
| 2b. Plants without stinging hairs | |
| 3a. Flowers in capitate receptacles | <i>Elatostema</i> 2 |
| 3b. Flowers not in capitate receptacles | |
| 4a. Flowers in cymose inflorescence ; cystoliths linear | |
| 5a. Leaves opposite, serrate | <i>Pilea</i> 6 |
| 5b. Leaves alternate, entire | <i>Pellionia</i> 5 |
| 4b. Flowers in sessile clusters ; cystoliths punctiform | <i>Pouzolzia</i> 7 |

1b. Large shrubs or small trees

- | | |
|---|--------------------|
| 6a. Inflorescence in clusters of longspikes ; stigma filiform | <i>Boehmeria</i> 1 |
| 6b. Inflorescence in short cymes or panicles ; stigma discoid | <i>Oreocnide</i> 4 |

1. BOEHMERIA Jacq.

Boehmeria malabarica Wedd., Arch. Mus. Hist. Nat. Paris 8 : 355. 1855-56 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 575. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1386. 1928. *B. travancorica* Bedd., For. Man. 225. 1872 & in Fl. Sylvat. t. 27, f. 2. 1869.

Shrubs, 2 — 3.5 m high ; branches pubescent. Leaves 5 — 20 × 2.5 — 9 cm, ovate, membranous, crenate serrate or rarely entire, pubescent beneath, acuminate at apex, acute or rounded at base ; petioles 2 — 6.5 m long. Flowers greenish white, in axillary clusters of spikes. Achenes ovoid, minute.

Fl. & Fr. : March June.

Rare in the humid Sholas of Vaithamalai and Tekkumalai.

2. ELATOSTEMA Forst. *et* Forst. f. *nom. gen. cons.*

Elatostema lineolatum Wt., Ic. t. 1984. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 565. 1838 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1376. 1928.

Erect herbs, 30 — 60 cm high ; branches pubescent, tomentose or setose hairy. Leaves subsessile, 5 — 12.5 × 1.5 — 3.5 cm, linear lanceate, oblong lanceate or obliquely lanceate, entire or coarsely serrate, acuminate or caudate acuminate at apex, acute or cuneate at base ; cystoliths conspicuous, crowded. Flowers greenish white in sessile capitate receptacles.

Fl. & Fr. : January June.

Common in the shola forest floor at the higher altitudes like Karuppuswamy Kovil on the way to Vaithamalai, and Tekkumalai.

3. LAPORTEA Gaud. *nom. gen. cons.*

Laportea interrupta (Linn.) Chew, Gard. Bull. Singapore 21 : 200. 1965. *Urtica interrupta* Linn., Sp. Pl. 985. 1753. *Fleurya interrupta* (Linn.) Gaud., Freyc. Voy. Bot. 497. 1830 ; Wt., Ic. t. 1975. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 548. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1372. 1928.

Much branched, erect herbs, 50 — 90 cm high ; stem and branches furrowed, with stinging hairs. Leaves 4 — 13.5 × 3 — 10 cm, ovate dentate, sparsely hairy on both sides, acuminate at apex, subcordate at base ; petioles 4 — 12 cm long. Flowers yellowish green in axillary long racemes. Achenes ovoid, compressed, keeled.

Fl. & Fr. : June September.

Rare along the sides of rocks in the humus soil at Five falls.

4. OREOCNIDE Miq.

Oreocnide integrifolia (Gaud.) Miq., Ann. Mus. Bot. Lugd. Bat. 34 : 306. 1869. *Villebrunea integrifolia* Gaud., Voy. Bonite t. 91. 1844 46 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 589. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1388. 1928.

Trees ; young branches pubescent. Leaves 6.5 — 25 × 2.2 — 7.5 cm, elliptic - oblong or oblanceate, entire, finely pubescent along the nerves beneath, acuminate or caudate acuminate at apex, narrowed at base ; petioles 0.5 — 3.5 cm long, pubescent. Flowers in small globose clusters of axillary dichotomous cymes.

Fl. : August.

Courtallum (Robert Wight 855, CAL).

5. PELLIONIA Gaud. *nom. gen. cons.*

Pellionia heyneana Wedd., Arch. Mus. Hist. Nat. Paris 9 : 287, t. 5. 1856 & in DC., Prodr. 16 (1) : 169. 1869 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 561. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1380. 1928.

Erect herbs, 15 — 30 cm high ; stem creeping and woody at base. Leaves 10 — 17 × 4.5 — 9 cm, unequilateral, falcately oblong or elliptic lanceate, entire with numerous linear cystoliths above, obtusely acuminate at apex, cordate and 3 - nerved at base ; petioles 0.4 — 0.7 cm long, stout, hirsute. Flowers pink in capituliform, peduncled axillary cymes. Achenes broadly ovate, more or less compressed.

Fl. & Fr. : March - September.

Fairly common in the Shola forests on the way to Vaithamalai.

6. PILEA Lindl. *nom. gen. cons.*

- | | |
|---|---------------------------|
| 1a. Erect, robust herbs ; leaves large, oblong lanceate | <i>P. melastomoides</i> 1 |
| 1b. Prostrate, fragile herbs ; leaves minute, elliptic or orbicular | <i>P. microphylla</i> 2 |

1. *Pilea melastomoides* (Poir.) Wedd., Ann. Sci. : Nat. ser. 4, 1 : 186. 1854 ; Henry *et* Bela Roy, Bull. Bot. Surv. India 10 : 276. 1968. *Urtica melastomoides* Poir. in Lamk., Enc. Meth. Bot. Suppl. 4 : 223. 1816. *Pilea trinervia* Wt., Ic. t. 1973. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 557. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1379. 1928.

Robust, succulent herbs ; stem glabrous with swollen nodes. Leaves 7.5 — 13.5 × 2.8 — 5.5 cm, oblong-lanceate or broadly-elliptic, deeply serrate, acuminate at apex, acute or cuneate and 3 nerved at base ; petioles 1 — 5.5 cm long. Flowers in axillary cymes.

Fl. : April.

Courtallum (Robert Wight 841, CAL).

2. *Pilea microphylla* (Linn.) Liebm., Vidensk. Selsk. Skr. ser. 5, 2 : 296. 1851 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1379. 1928. *Parietaria microphylla* Linn., Syst. ed. 10 : 1308. 1759. *Pilea muscosa* Lindl., Coll. Bot. t. 4. 1821 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 551. 1888.

Prostrate, slender herbs, up to 8 cm long. Leaves minute, elliptic or orbicular, entire, obtuse at apex, shortly petioled. Flowers green, minute in axillary cymes. Achenes minute, ovoid.

Fl. & Fr. : August — October.

A weed in the wet rocky soil at Main falls and on the way to Tekkumalai.

7. *POUZOLZIA* Gaud.

- 1a. Upper leaves not running out into bracteate spikes or reduced into bracts or smaller
 - 2a. Lateral ribs of the leaves forked *P. auriculata* 1
 - 2b. Lateral ribs of the leaves not forked
 - 3a. Lower leaves opposite, upper leaves alternate, primary nerves only one pair ; flowers in short axillary cymes *P. zeylanica* 5
 - 3b. Leaves opposite or ternate ; primary nerves 3 - 5 ; flowers in sessile axillary clusters *P. sponiaefolia* 3
- 1b. Upper leaves running out into bracteate spikes and reduced into bracts
 - 4a. Leaves truncate or narrowed at base ; flowers pinkish - white *P. wightii* 4
 - 4b. Leaves cordate at base ; flowers greenish *P. pentandra* 2

1. *Pouzolzia auriculata* Wt., Ic. t. 1950, f. 2. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 582. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1383. 1928.

Stout undershrubs, 60 - 90 cm high ; young branches terete, pubescent. Leaves 2.5 — 9.5 × 0.8 — 3 cm, ovate or ovate lanceate, thin, entire, pubescent on both sides, acute or acuminate at apex, narrowed or rounded at base ; petioles 0.5 — 2.5 cm long, slender, pubescent. Flowers greenish or white with yellow anthers, sessile or very shortly pedicelled in axillary clusters, hirsute with white hairs. Achenes winged or not, strigose.

Fl. & Fr. : November - March.

Common in the rocky soil around Main falls and in the shaded areas at Tiger falls.

2. *Pouzolzia pentandra* (Roxb.) Been., Pl. Jav. Rar. 64, t. 14. 1838 ; Wt., Ic. t. 2096, f. 20. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 583. 1888 ; Fischer in Gamble Fl. Presid. Madras 3 (8) : 1383. 1928. *Urtica pentandra* Roxb., Fl. Ind. 3 : 583. 1832.

Erect undershrubs, 1 — 1.5 m high ; branches glabrous, angular. Leaves sessile or shortly petioled, up to 15 × 3 cm, oblong - lanceate, entire, glabrous or pubescent, hispid along the nerves beneath, acute or acuminate at apex, cordate at base. Flowers greenish in terminal long spikes. Achenes winged.

Fl. & Fr. : December - April.

Common along the sides of the dried hill stream before Old Courtallum falls and in the humus soil at New falls and Tekkumalai.

3. *Pouzolzia sponiaefolia* Schlechter, Pl. Exsicc. Ind. Or. no. 1045. 1841. *P. bennettiana* Wt., Ic. t. 1978. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 585. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1384. 1928.

Erect undershrubs, 30 - 60 cm high ; stem feebly branched, tomentose or pubescent. Leaves up to 14.5 × 2.8 cm, lanceate, entire, pubescent on both sides, 3 - nerved from the base to the tip, acuminate at apex, rounded at base ; petioles ± 0.3 cm long, pubescent. Flowers in sessile axillary clusters. Achenes winged.

Fl. & Fr. : August - March.

Common on the way to Tekkumalai and at New falls.

4. *Pouzolzia wightii* Benn., Pl. Jav. Rar. 66. 1838 ; Wt., Ic. t. 2093, f. 10. 1953 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 584. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1383. 1928.

Erect robust herbs or undershrubs, up to 1 m high ; stem terete, glabrous. Leaves up to 14.5 × 4.5 cm, opposite or alternate, reduced towards apex, and merging with the floral bracts, elliptic or elliptic lanceate, almost glabrous, acuminate at apex, truncate or narrowed at base. Flowers pinkish white in sessile clusters in the axils of upper leaves and bracts forming spikes.

Fl. : December.

Common undergrowth in the forest floor at Tekkumalai.

5. *Pouzolzia zeylanica* (Linn.) Benn., Pl. Jav. Rar. 67. 1838 ; Merr., Trans. Amer. Philos. Soc. n. s. 24 (2) : 140. 1935. *Parietaria zeylanica* Linn., Sp. Pl. 1052. 1753. *Pouzolzia indica* (Linn.) Gaud., Freyc. Voy. Bot. 503. 1826 ; Wt., Ic. t. 1980, f. 1. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 581. 1888 ; Fischer in Gamble, Fl. Presid. Madras 3 (8) : 1382. 1928.

Erect herbs, 20 — 30 cm high ; branches glabrous. Leaves up to 8.5 × 3.5 cm, lower opposite, upper alternate, acute at both ends ; petioles 1 — 1.2 cm long slender, glabrous ; stipules free, ovate, ciliate. Flowers greenish in short axillary cymes. Achenes ovoid.

Fl. & Fr. : September - October.

Common in Tekkumalai and Shembagadevi.

14. NYCTAGINACEAE

- | | |
|---|--------------------|
| 1a. Unarmed herbs ; flowers perfect, stigma capitate | <i>Boerhavia</i> 1 |
| 1b. Armed straggling shrubs ; flowers usually imperfect, stigma penicillate | <i>Pisonia</i> 2 |

1. BOERHAVIA Linn.

Boerhavia diffusa Linn., Sp. Pl. 3. 1753 ; Gamble, Fl. Presid. Madras 2 (7) : 1162. 1925. *B. repens* Linn., Sp. Pl. 3. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 709. 1885. *B. procumbens* Roxb., Fl. Ind. 1 : 146. 1820 ; Wt., Ic. t. 874. 1844 - 45.

Diffuse, procumbent herbs, 60 - 90 cm long ; branches brownish red, swollen at nodes, erect at apex. Leaves 2 — 6 × 0.5 — 3 cm, variable in shape, broadly ovate, oblong or orbicular, entire glabrous above, slightly hairy beneath. Flowers pink or purple, minute in axillary corymbose umbels. Fruits small, clavate, ribbed, glandular.

Fl. & Fr. : September — May.

A common weed of the waste places in Courtallum.

2. *PISONIA* Linn.

Pisonia aculeata Linn., Sp. Pl. 1026. 1753 (based on Plumier, Nov. Gen. 7, t. 11. 1703) ; Wt., Ic. t. 1763, 1764. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 711. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1163. 1925 ; Stemmerik, Blumea 12 : 284. 1964. *P. mitis* Linn., Sp. Pl. 2 : 1026. 1753. *P. villosa* Poir. in Lamk., Enc. Meth. Bot. 5 : 347. 1804. *Karindu*, *Murukkalli*, *Muruvillicodi* (Tamil).

Armed, straggling shrubs, up to 12 m high ; branches pendulous ; spines solitary, axillary, recurved. Leaves 2.5 — 7 × 1 — 3.5 cm, ovate, oblong or elliptic, puberulous or glabrous, obtuse or obscurely acuminate at apex, acute at base ; petioles 1.5 - 3.5 cm long. Flowers greenish in axillary or terminal dense cymes. Fruits 1 — 1.5 cm long, almost linear, five ribbed, each rib bearing a biseriate row of prickles.

Fl. & Fr. : September — May.

A gregarious straggler around Tiger falls and below Chittaruvi.

15. MOLLUGINACEAE

MOLLUGO Linn.

Mollugo pentaphylla Linn., Sp. Pl. 89. 1753 ; Gamble, Fl. Presid. Madras 1 (3) : 553. 1919. *M. stricta* Linn., Sp. Pl. ed. 2 : 131. 1762 ; Wt. et Arn., Prodr. 44. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 663. 1878.

Erect herbs, 15 - 30 cm high ; branches thin, angular. Leaves rosulate, 1.2 — 3.8 × 0.2 — 0.6 cm, oblong ovate or spatulate, acute or obtuse at apex, much narrowed at base ; upper leaves mostly lanceate or linear from a narrowed base. Flowers greenish white in terminal cymes. Capsules broadly—ellipsoid, 3 lobed ; seeds numerous, dark brown.

Fl. & Fr. : June August.

A weed, common in the dry, rocky soil around Main falls.

16. CARYOPHYLLACEAE

- | | |
|--|----------------------|
| 1a. Stipules of several bristles ; petals 5, 2 - 6 fid ; leaves roundish ; plants procumbent or ascending | <i>Drymaria</i> 1 |
| 1b. Stipules scaly without any bristles ; petals 5, entire or toothed ; leaves subulate or linear ; plants erect | <i>Polycarpaea</i> 2 |

1. DRYMARIA Willd. ex Roem. et Schult.

Drymaria cordata (Linn.) Willd. ex Roem. et Schult., Syst. Veg. 5 : 406. 1819 ; Wt. et Arn., Prodr. 359. 1834 ; Edgew. et Hook. f. in Hook. f., Fl. Brit. Ind. 1 : 244. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 63. 1915 ; Mizushima, J. Jap. Bot. 32 : 78. 1957 ; Duke, Ann. Mo. Bot. Gard. 48 : 251. 1961 ; Malick et Majumdar, Bull Bot. Surv. India 16 : 151. 1974 (1977). *Holosteum cordatum* Linn., Sp. Pl. 88. 1753. *Drymaria cordata* ssp. *diandra* (Bl.) Duke, Ann. Mo. Bot. Gard. 48 : 253. 1961 ; Majumdar, Bull. Bot. Surv. India 10 : 294. 1968. *Drymaria diandra* Bl., Bijdr. 61. 1825. *D. villosa* subsp. *villosa* sensu Mizushima, loc. cit. ; Majumdar, Indian For. 94 : 645. 1968.

Prostrate or ascending herbs, 14 - 16 cm long ; branches rooting at lower nodes, filiform, glabrous. Leaves 0.8 — 1.8 × 0.6 — 1.4 cm, roundish, entire, glabrous, rounded at apex, narrowed into the petiole from a truncate base ; petioles 0.3 — 0.5 cm long, filiform ; stipules filiform, bristle like, often shorter than the petioles. Flowers in terminal cymes. Capsules ovoid, 0.2 — 0.3 cm long, trigonous.

Fl. & Fr. : November.

Common undergrowth in the coffee estates.

2. POLYCARPAEA Lamk.

Polycarpaea corymbosa (Linn.) Lamk., Enc. Meth. Bot. 2 : 129. 1797 ; Wt. et Arn., Prodr. 90. 1834 ; Wt., Ic. t. 712. 1840 ; Edgew. et Hook. f. in Hook. f., Fl. Brit. Ind. 1 : 245. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 64. 1915 ; Baker, Acta Bot. Neerl. 6 : 51. 1957. *Achyranthes corymbosa* Linn., Sp. Pl. 205. 1753. *Polycarpaea spadicea* Lamk. in DC., Prodr. 3 : 374. 1828 ; Wt. et Arn., loc. cit. p. 357.

Erect, pubescent herbs, 10 — 15 cm high ; base woody. Leaves up to 2.5 cm long, narrowly linear, entire, acute at apex, tapering at base ; stipules lanceate or subulate, fimbriate. Flowers pinkish - white or white in terminal cymes. Capsules small, oblong.

Fl. & Fr. : May August.

Fairly common in the rocky areas above Tiger falls and on the way to Tekkumalai.

17. PORTULACACEAE

PORTULACA Linn.

Portulaca pilosa Linn., Sp. Pl. 445. 1753 ; Geesink, Blumea 17 : 295. 1969. *P. tuberosa* Roxb., (Hort. Beng. 91. 1814 *nom. nud.*) Fl. Ind. 2 : 464. 1832 ; Wt. et Arn., Prodr. 356. 1834 ; Dyer in Hook. f., Fl. Brit. Ind. 1 : 246. 1874. *P. cristata* Wall., Cat. no. 6844 *nomen cf.* Wt. et Arn., Prodr. 356. 1834. *P. suffruticosa* Wall. ex Wt. et Arn., Prodr. 356. 1834 ; Dyer, *loc. cit.* p. 247 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 66. 1915.

Erect herbs, 15 — 25 cm high ; branches hairy, hairs up to 0.6 cm long. Leaves 0.5 — 1.5 cm long, elliptic to linear, terete or elliptic in section, acute at apex. Flowers yellow in terminal capitula ; bracteoles upto 0.2 cm long, hairy between them. Capsules 0.5 — 0.6 cm across, almost globose, shiny.

Fl. & Fr. : March December.

Very common weed in the forests above Chittaruvi, around Main falls and at Tiger falls.

18. AMARANTHACEAE

1a. Anthers 1-loculed

2a. Flowers in axillary dense spikes

Alternanthera 3

2b. Flowers in solitary terminal heads

Gomphrena 7

1b. Anthers 2-loculed

3a. Leaves alternate

4a. Plants armed

Amaranthus 4

- 4b. Plants unarmed
 - 5a. Stamens 5, staminodes absent *Celosia* 5
 - 5b. Stamens 4 - 5 with interposed linear staminodes *Aerva* 2
- 3b. Leaves opposite
 - 6a. Flowers all perfect in an inflorescence
 - 7a. Bracts and bracteoles spinescent *Achyranthes* 1
 - 7b. Bracts and bracteoles not spinescent *Psilotrichum* 8
 - 6b. Flowers 1 - 2 perfect, rest imperfect as bristles in an inflorescence
 - 8a. Staminodes absent *Pupalia* 9
 - 8b. Staminodes present, 2 - 3
fid or lacerate *Cyathula* 6

1. *ACHYRANTHES* Linn.

- 1a. Leaves linear or elliptic - lanceate, acuminate at apex *A. bidentata* 2
- 1b. Leaves broadly - elliptic or elliptic - lanceate, acute at apex *A. aspera* 1

1. *Achyranthes aspera* Linn., Sp. Pl. 204. 1753 ; Wt., Ic. t. 1777. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 730. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1176. 1925.

Erect herbs, 0.5 — 1 m high ; stem and branches terete, young parts hairy. Leaves 4 — 6.5 × 2.5 — 4.5 cm, broadly ovate or elliptic - lanceate, entire, hairy on both sides, acute at apex, rounded at base ; petioles up to 1 cm long, pubescent. Flowers greenish, deflexed, sessile in terminal and axillary long spikes. Urlicles ± 0.5 cm long, obovoid, becoming spiny and pointed later.

Fl. & Fr. : July January.

Common weed in the waste places around Main falls and on the way to Five falls.

2. *Achyranthes bidentata* Bl., Bijdr. 545. 1825 ; Wt., Ic. t. 1779. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 730. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1176. 1925.

Erect herbs, up to 1.5 m high ; branches slender, rambling, sparsely hairy. Leaves $4.5 - 17 \times 1.5 - 3.5$ cm, lanceate or linear lanceate, membranous, sparsely hairy on both surfaces, acuminate at apex, narrowed at base ; petioles 0.6 — 1.5 cm long, sparsely hairy. Flowers greenish with a red tinge, in axillary and terminal spikes with slender, hairy rhachis. Urlicles 0.2 — 0.3 cm long, smooth, straw coloured, enclosed in the perianth lobes.

Fl. & Fr. : August — February.

Fairly common in the shaded and moist forest areas around Honey falls.

2. AERVA Forssk. *nom. gen. cons.*

Aerva lantana (Linn.) Juss., Ann. Mus. Hist. Nat. Paris 2 : 131. 1803 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 728. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1178. 1925. *Achyranthes lantana* Linn., Sp. Pl. 204. 1753.

Prostrate herbs ; branches terete, pubescent, striated. Leaves $2 - 4 \times 0.8 - 2$ cm, obovate or orbicular, entire, pubescent, obtuse or acute at apex, tapering at base ; petioles up to 0.6 cm long. Flowers white in axillary spikes. Urlicles broadly ovoid, acute.

Fl. & Fr. : September - December.

A weed in the open areas and plains.

3. ALTERNANTHERA Forssk.

Alternanthera sessilis (Linn.) R. Br. ex DC., Cat. Hort. Monsp. 77. 1813 ; Wt., Ic. t. 727. 1843 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 731. 1885 ; Subr., Aquat. Angio. 41. 1962. *Gomphrena sessilis* Linn., Sp. Pl. 225. 1753. *A. triandra* Lamk., Enc. Meth. Bot. 1 : 95. 1783 ; Gamble, Fl. Presid. Madras 2 (7) : 1179. 1925.

Semiaquatic, often prostrate herbs, 15 — 50 cm long, rooting at lower nodes. Leaves $2 - 4 \times 1 - 2$ cm, linear oblong or lanceate, thin, glabrous, obtuse or subacute at apex, tapering at base. Flowers white in dense, axillary spikes. Urlicles up to 0.3 cm long, obcordate, compressed.

Fl. & Fr. : September — February.

A common weed in moist localities along the sides of ponds and small canals on the way to Five falls and at Main falls.

4. AMARANTHUS Linn.

Amaranthus spinosus Linn., Sp. Pl. 991. 1753 ; Wt., Ic. t. 513. 1841 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 718. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1170. 1925.

Erect, feebly branched armed herbs, 20–50 cm high ; stems swollen at the nodes, grooved, glabrous ; spines axillary, 1–1.5 cm long, straight, yellowish. Leaves 3–6.5 × 0.5–3.5 cm, ovate or oblong, entire, glabrous, obtuse or mucronate at apex, cuneate at base ; petioles 1–2.5 cm long. Flowers greenish in compact axillary and terminal spikes. Urlicles spheroid, rugose.

Fl. & Fr. : September–March.

A weed, common in the waste places on the way to Five falls.

5. CELOSIA Linn.

Celosia polygonoides Retz., Obs. Bot. 2 : 12. 1781 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 715. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1166. 1925.

Undershrubs, 15–50 cm high ; branches hairy. Leaves 1–2.5 × 1–2 cm, broadly-ovate, entire, glabrous above, pubescent along the nerves beneath, obtuse or subacute at apex, rounded or subcordate at base ; petioles up to 1.5 cm long. Flowers greenish-white in terminal spikes. Urlicles ± 0.2 cm long, flask-shaped.

Fl. & Fr. : September–March.

A weed, common in the shaded areas around Main falls.

6. CYATHULA Bl. *nom. gen. cons.*

Cyathula prostrata (Linn.) Bl., Bijdr. 549. 1825 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 723. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1172. 1925. *Achyranthes prostrata* Linn., Sp. Pl. ed. 2 : 296. 1762.

Slender herbs, rooting at lower nodes ; branches geniculately ascending. Leaves 1.5–5 × 0.5–2.5 cm, rhomboid or ovate, thin, often tinged purple beneath, sparsely hairy on both surfaces, subacute at apex, cuneate at base ; petioles up to 0.6 cm long, glabrous or sparsely hairy. Flowers greenish white in small drooping clusters of lax terminal racemes. Urlicles ± 0.3 cm long, ovoid, membranous.

Fl. & Fr. : Almost throughout the year.

Common in shaded localities of Tekkumalai and along road sides and forest outskirts.

7. GOMPHRENA Linn.

Gomphrena celosioides Mart. in Beitr. Amar. 93. 1825 & in Nov. Act. Nat. Cur. 13 : 301. 1826 ; Raizada, J. Bombay Nat. Hist. Soc. 48 : 675. 1949. *G. decumbens sensu* Gamble, Fl. Presid. Madras 2 (7) : 1179. 1925.

Diffuse trailing herbs ; branches quadrangular, hairy. Leaves 2 — 4.5 × 0.5 — 1 cm, elliptic oblong or obovate, glabrous on the upper side, hairy on the lower, subacute at apex, acute at base ; petioles ± 0.5 cm long. Flowers greenish white in terminal capitate spikes. Urlicles ovoid.

Fl. & Fr. : August — December.

Waste areas around Chittaruvu, along with grasses and other weeds.

8. PSILOTRICHUM Bl.

1a. Leaves petioled 0.5 - 0.7 cm long ; spikes towards the apex of branches, robust

P. nudum 2

1b. Leaves sessile ; spikes axillary, slender

P. elliotii 1

1. *Psilotrichum elliotii* Baker in Thiselton Dyer, Fl. Trop. Africa 6 (1) : 58. 1909 ; Townsend in Revis. Fl. Ceylon 1 : 45. 1980. *P. calceolatum* Moq., DC., Prodr. 13 (2) : 280. 1849 (*nom. nud.*) ex Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 725. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1174. 1925. *P. moquinianum* Abeywickrama, Ceylon J. Sci. 2 (1) : 83. 1959.

Scarious undershrubs, 30 - 45 cm high ; stems feebly branched, pubescent when young. Leaves sessile, 2 — 5 × 1 — 2.5 cm, ovate or elliptic ovate, entire, glabrous or slightly pubescent, acute with a short mucro at apex, ovate at base. Flowers greenish white in short axillary spikes in most of the axils of the leaves ; bracts ovate, minute, mucronate. Urlicles globose.

Fl. & Fr. : August — December.

Scarce, around Main falls in rocky soil.

2. *Psilotrichum nudum* (Heyne ex Wall.) Moq. in DC., Prodr. 13 : 280. 1849 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 724. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1174. 1925. *Achyranthes nuda* Heyne ex Wall. in Roxb., Fl. Ind. 2 : 507. 1824.

Herbs or undershrubs, 30—60 cm high ; branches dichotomous towards apex, glabrous. Leaves 3.5—7 × 1.2—2.5 cm, ovate lanceate, entire, glabrous, acuminate at apex, acute at base ; petioles 0.5—0.7 cm long, slender, glabrous. Flowers greenish white in spikes towards the upper axils ; bracts lanceate, awned apically, pubescent. Urlicles lanceate.

Fl. & Fr. : August—December.

At Honey falls in the open areas along the sides of rocks.

9. PUPALIA Juss. nom. gen. cons.

Pupalia lappacea (Linn.) Juss., Ann. Mus. Hist. Nat. Paris 2 : 132. 1803 ; Hook. f. in Hook. f., Fl. Brit. Ind. 4 : 724. 1885 ; Gamble, Fl. Presid. Madras 2 (7) : 1173. 1925. *Achyranthes lappacea* Linn., Sp. Pl. 204. 1753.

Straggling herbs ; branches terete, tomentose. Leaves 3—10 × 1.5—5 cm, elliptic or ovate, acute or obtuse at apex, rounded at base ; nerves prominent beneath. Flowers greenish in axillary or terminal long spikes ; imperfect flowers of the inflorescence as hooked bristles, yellowish at maturity. Urlicles membranous, oblong, enclosed in the parianth.

Fl. & Fr. : August—December.

Common in the open areas around Main falls.

19. POLYGONACEAE

POLYGONUM Linn.

- 1a. Erect herbs ; flowers rose - coloured in terminal racemose panicles

P. glabrum 2

- 1b. Suspendulous or decumbent undershrubs ; flowers white in terminal paniculate heads

P. chinense 1

1. *Polygonum chinense* Linn., Sp. Pl. 363. 1753 ; Wt., Ic. t. 1806. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 44. 1886 ; Gage, Rec. Bot.

Surv. India. 2 : 408. 1902 ; Gamble, Fl. Presid. Madras 2 (7) : 1190. 1925 ; Steward, Contr. Gray Herb. Harv. 88 : 70. 1930. *Persicaria chinensis* (Linn.) Gross, Bot. Jahrb. 49, 269 : 177, 315. 1913.

Decumbent or subpendulous undershrubs, 30 - 100 cm long ; stem cylindric, glabrous with long divaricate branches. Leaves 4.5 — 12 × 2.5 — 4.5 cm, elliptic or ovate-oblong, entire, glabrous, acute or shortly acuminate at apex, truncate or shortly cuneate at base ; ocreae long, membranous, acuminate. Flowers in white heads forming terminal panicles ; peduncle glandular, setose. Nutlets 0.4 — 0.6 cm long, trigonous, black.

Fl. & Fr. : July - March.

Common in Tekkumalai and around Five falls.

2. *Polygonum glabrum* Willd., Sp. Pl. 2 : 447. 1799 ; Wt., Ic. t. 1709. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 34. 1886 ; Gage, Rec. Bot. Surv. India 2 : 393. 1902 ; Gamble, Fl. Presid. Madras 2 (7) : 1189. 1925 ; Steward, Contr. Gray Herb. Harv. 88 : 43. 1930 ; Subr., Aquat. Angio. 43. 1962.

Erect, glabrous herbs, 1 — 1.5 m high ; stem cylindric, rooting at lower nodes. Leaves 10 — 22 × 1 — 3 cm, linear-lanceate, entire, glabrous, gland-dotted, acuminate at apex, tapering at base ; petioles 0.5 — 1 cm long ; ocreae tubular, glabrous. Flowers rose coloured in terminal racemose panicles. Nutlets ± 0.5 cm long, ovoid, compressed.

Fl. & Fr. : Almost throughout the year.

Common at Five falls and in Thippakulam.

20. PLUMBAGINACEAE

PLUMBAGO Linn.

Plumbago zeylanica Linn., Sp. Pl. 151. 1753 ; Wt., Ic. t. 179. 1839 ; Clarke in Hook. f., Fl. Brit. Ind. 3 : 480. 1882 ; Gamble Fl. Presid. Madras 2 (4) : 744. 1921.

Rambling or subscandent herbs or undershrubs, 50 - 90 cm high ; branches spreading, striated, glabrous. Leaves 3.5 — 7.5 × 2 — 5.5 cm, ovate, entire, glabrous above, glaucous beneath, subacute at apex, attenuate at base ; petioles auricled, slender. Flowers white in terminal elongate spikes ; calyx glandular, sticky hairy. Capsules oblong, membranous below, circumsciss above, grooved ; seed cylindrical.

Fl. & Fr. : September – February.

A weed, naturalized as an undergrowth along the sides of the ravines in Ammathottam and at Five falls.

21. THEACEAE

CAMELLIA Linn.

Camellia sinensis (Linn.) O. Ktze., Acta. Hort. Petrop. 10 : 195. 1887 (in obs.) ; Melchior in Engl. & Prantl, Pflanzenfam. (ed. 2) 21 : 131, f. 61. 1960 ; Sealy, Revis. *Camellia* 112, f. 54. 1958. *Thea sinensis* Linn., Sp. Pl. 515. 1753. *Camellia thea* Link, Enum. Hort. Berol. 2 : 73. 1822 ; Dunn in Gamble, Fl. Presid. Madras I (1) : 80. 1915. *Kattu-theyela*, *Theyela* (Malayalam). *Theyelai* (Tamil).

Woody shrubs, 30–100 cm high ; branches straight, stout, glabrous. Leaves 5 — 12.5 × 2 — 4.5 cm, elliptic, shallowly serrate, long acuminate at apex, acute at base ; petioles 0.2–0.3 cm long, stout. Flowers white with yellow anthers, showy, solitary or in groups of 2–3, axillary. Capsules 3 or 2 coccate and lobed, green, glabrous ; each coccus 1 or 2 seeded.

Fl. & Fr. : January – March.

Growing wild along the slopes of Kailasamottai in the shola forests.

22. ELATINACEAE

1a. Flowers solitary in the axils ; plants prostrate

Elatine 2

1b. Flowers fascicled in the axils ; plants erect or decumbent

Bergia 1

1. BERGIA Linn.

Bergia ammanoides Heyne ex Roth, Nov. Sp. Pl. Ind. Or. 219. 1821 ; Dyer in Hook. f., Fl. Brit. Ind. 1 : 251. 1874 ; Dunn in Gamble, Fl. Presid. Madras I (1) : 69. 1915. *Elatine ammanoides* Wt. et Arn., Prodr. 41. 1834. *Bergia ammanoides* Heyne ex Roth var. *pentandra* Wt., Ill. Ind. Bot. 54, t. 25a. 1840.

Erect or decumbent herbs, 15–30 cm high ; stems glandular pubescent. Leaves 1.5 — 3 × 0.3 — 0.5 cm elliptic-oblong, serrate in the upper half, hairy, subacute at apex, narrowed at base. Flowers pink, sessile in axillary fascicles. Capsules subglobose, minute.

Fl. & Fr. : March August.

A weed, common in moist places and along the sides of the streams.

2. ELATINE Linn.

Elatine triandra Schk., Bot. Handb. 1 : 345. 1808 (*sensu lato*) ; Subr., Aquat. Angio. 10. 1962 ; Ramayya & Rajgopal, Bull. Bot. Surv. India 13 : 330. 1971. *E. americana* Arn., Edinb. J. Nat. & Geogr. Sci. 1 : 431. 1830 ; Dyer in Hook. f., Fl. Brit. Ind. 1 : 251. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 68. 1874.

Slender, prostrate herbs, up to 12 cm long. Leaves up to 0.8 × 0.2 cm, ovate oblong, spathulate, entire, glabrous, obtuse at apex, ovate at base ; petioles winged. Flowers red, solitary, axillary. Capsules up to 0.2 cm in diameter, subglobose, membranous.

Fl. & Fr. : October January.

Semiaquatic or aquatic, around Main falls.

23. GUTTIFERAE

- 1a. Ovary many locular, each locule 1 - ovuled ; styles short or absent

Garcinia 2

- 1b. Ovary 1 - locular, 1 - ovuled or 1 2 locular and 2 - 4 ovuled ; style 1 or 2, slender

- 2a. Ovary 1 - locular, 1 - ovuled

Calophyllum 1

- 2b. Ovary 1 2 locular, 2 - 4 ovuled

Mesua 3

1. CALOPHYLLUM Linn.

Calophyllum inophyllum Linn., Sp. Pl. 513. 1753 ; Wt. et. Arn., Prodr. 103. 1834 ; Wt., Ic. t. 77. 1839 ; T. Anders. in Hook. f., Fl. Brit. Ind. 1 : 275. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 76. 1915 ; Mahesh., Bull. Bot. Surv. India 2 : 145. 1960. *C. blumei* Wt., Ill. Ind. Bot. t. 1 : 128. 1840. *Punna* (Malayalam). *Punnai* (Tamil).

Evergreen trees, 10 - 15 m high ; bark greyish, smooth. Leaves 10 — 20 × 5 — 10 cm, elliptic oblong or obovate, thick, entire, glabrous, rounded or emarginate at apex, acute at base ; mid - vein prominent,

side veins parallel, close, at right angles to the midrib ; petioles 1 — 1.5 cm long, stout. Flowers white, fragrant in lax axillary racemes. Drupes 2 — 3 cm in diameter, globose, yellow when ripe.

Fl. & Fr. : July — January.

Gracefull trees along the sides of the stream below Main falls and also in the plains on the way to Old Courtallum.

2. GARCINIA Linn.

Garcinia cambogia (Gaertn.) Desr. in Lamk., Enc. Meth. Bot. 3 : 701. 1892 ; Wt. et Arn., Prodr. 100. 1834 ; Wt., Ic. t. 960, 961. 1845 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 73. 1915 ; Sealy, Kew Bull. 1956 : 341. 1956 ; Mahesh., Bull. Bot. Surv. India 6 : 129. 1964. *Mangostana cambogia* Gaertn., Fruct. 2 : 106. 1790. *Garcinia roxburghii* Wt., Ill. Ind. Bot. t. 125. 1840 (*pro parte*). *Kodampuli*, *Kodapuli* (Malayalam). *Penampuli*, *Kodakkapuli* (Tamil).

Trees, 10 — 18 m high ; bark grey, rugose ; branches drooping or horizontal. Leaves 7 — 15 × 2 — 5 cm, oblong, elliptic or lanceate, thick, glabrous, acute or obtusely short acuminate at apex, cuneate at base ; midrib prominent beneath ; petioles 0.5 — 1.2 cm long. Flowers yellowish, hermaphrodite or male ; male flowers in short axillary fascicles ; hermaphrodite flowers terminal or axillary, solitary. Berries ± 5 cm across, 6 — 8 grooved, yellow ; seeds 6 — 8 with succulent, sweet aril.

Fl. & Fr. : January — October.

Common below Shembagadevi in the valleys and along the sides of the stream.

3. MESUA Linn.

Mesua nagassarium (Burm. f.) Kosterm. var. *coromandelina* (Wt.) K.K.N. Nair, Ind. J. For. 7 : 80. 1984. *M. coromandelina* Wt., Ic. t. 117. 1839 & Ill. Ind. Bot. t. 129. 1840 ; Dunn in Gamble, Presid. Madras 1 (1) : 77. 1915 (in syn.). *M. ferrea* Wt. et Arn., Prodr. 102. 1834 (*non* Linn.). *Nanga*, *Veluthapala* (Malayalam). *Nangu*, *Nagochampakm* (Tamil).

Evergreen trees, 20 — 30 m high ; trunk erect, buttressed at base. Leaves up to 6.3 × 1.3 cm, narrowly lanceate, glabrous, shiny green

above, pale or rarely glaucous beneath, tapering into a blunt acumen at apex, narrowed at base ; petioles 0.5 — 1.2 cm long. Flowers reddish yellow, fragrant, solitary, axillary or terminal. Fruits 2.5 — 3 cm long, ovoid, shortly acuminate at apex.

Fl. & Fr. : May -July.

Gracefull trees, around Main falls and on the way to Five falls.

24. TILIACEAE

- 1a. Erect shrubs or small trees ; fruits drupaceous
 - 2a. Leaves serrate, crenate, serrulate or dentate ;
flowers in terminal or axillary umbellate cymes *Grewia* 2
 - 2b. Leaves entire ; flowers in terminal panicles *Microcos* 3
- 1b. Suberect or prostrate herbs ; fruits capsular *Corchorus* 1

1. CORCHORUS Linn.

Corchorus aestuans Linn., Syst. ed. 10 : 1079. 1759 (*non* Forssk. 1775) ; Fawc. *et* Rendle, J. Bot. 59 : 225. 1921. *C. acutangulus* Lamk., Enc. Meth. Bot. 2 : 104. 1786 ; Wt. *et* Arn., Prodr. 73. 1834 ; Wt., Ic. t. 739. 1844 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 398. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 121. 1915 ; Chakraborty, Bull. Bot. Soc. Bengal 5 : 78. 1952.

Erect or prostrate, hairy herbs, 45 — 60 cm high. Leaves 2.5 — 7.5 × 1.2 — 4 cm, ovate or ovate oblong, serrate, the lower serrations on both sides produced into short filiform appendages, acute at apex, rounded at base ; petioles 0.5 — 1 cm long. Flowers yellow in short axillary cymes. Capsules 2 — 3.5 cm long, erect, almost cylindrical or obscurely 6 angled, 3 — 6 winged, 3 beaked at apex.

Fl. & Fr. : October — February.

Fairly common in the open forest floor on the way to Tekkumalai.

2. GREWIA Linn.

- 1a. Plants densely yellowish - hirsute towards apex *G. hirsuta* 3
- 1b. Plants not hirsute
 - 2a. Leaves 5 - ribbed at base

- 3a. Fruits slightly 4-lobed; leaves irregularly lobed towards apex, deeply bidentate, scabrous above *G. abutilifolia* 1
- 3b. Fruits bilobed or not lobed; leaves not lobed, regularly serrate or toothed, glabrous above *G. tiliaefolia* 6
- 2b. Leaves 3-ribbed at base
 - 4a. Fruits not lobed, or irregularly lobed, velvety until old *G. bracteata* 2
 - 4b. Fruits 4-lobed, lobes more or less united, covered with stiff scattered hairs or long soft hairs
 - 5a. Leaves glabrous beneath; fruits slightly 4-lobed; hairs on the fruits stiff, scattered *G. orientalis* 5
 - 5b. Leaves with soft spreading tomentum beneath; fruits deeply 4-lobed, hairs on the fruit, long, closely arranged *G. oppositifolia* 4

1. **Grewia abutilifolia** Vent. ex Juss., Ann. Mus. Herb. Paris 4 : 92. 1804; Mast. in Hook. f., Fl. Brit. Ind. 1 : 390. 1874 (*pro parte*). *G. aspera* Roxb., Fl. Ind. 2 : 591. 1832; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 199. 1915. *Pampukonda* (Malayalam).

Straggling shrubs; young parts stellate hairy. Leaves 5 — 10.5 × 4 — 7.5 cm, roundish ovate, irregularly lobed, bidentate, scabrous above, stellate hairy beneath, acute or acuminate at apex, subcordate at base; petioles 0.8 — 1 cm long, pubescent. Flowers brick red in axillary umbellate cymes. Drupes 1 — 1.5 cm across, slightly 4-lobed, wrinkled, minutely, pubescent.

Fl. & Fr. : May — October.

Very rare above Shembagadevi in the dry, shrubby forest.

2. **Grewia bracteata** Heyne ex Roth, Nov. Sp. Pl. Ind. Or. 243. 1821; Wt. et Arn., Prodr. 76. 1834; Mast. in Hook. f., Fl. Brit. Ind. 1 : 389. 1874. *G. obtusa* Wall. Cat. no. 1103. 1829 *nom. nud.* (*pro parte*); Dunn in Gamble, Fl. Presid. Madras 1 (1) : 117. 1915. *Akkukullai* (Tamil).

Erect shrubs, 3 — 4 m high; young parts pubescent. Leaves 1.8 — 7.6 × 0.7 — 2.2 cm, ovate, bluntly serrulated, glabrous above, scabrous beneath on the nerves, shortly and bluntly acuminate at apex, acute at base; petioles 0.5 — 1 cm long, pubescent. Flowers in axillary 3-flowered peduncles. Drupes irregularly lobed or not lobed, narrowed towards the base, velvety.

Fl. & Fr. : June – October.

In the thick forest along the sides of the ravines above Chittaruvi and on the way to Tekkumalai.

3. *Grewia hirsuta* Vahl, *Symb. Bot.* 1 : 34. 1790 (*non* Smith) ; *Wt. et Arn.*, *Prodr.* 78. 1834 ; *Wt.*, *lc. t.* 76. 1838 ; *Mast. in Hook. f.*, *Fl. Brit. Ind.* 1 : 391. 1874 ; *Dunn in Gamble, Fl. Presid. Madras* 1 (1) : 119. 1915. *Tavidu* (Tamil).

Erect shrubs, 1–2 m high ; young parts softly yellowish hirsute. Leaves 3 — 7.5 × 1.2 — 3 cm, lanceate, pubescent on both sides, more on the lower side, serrate, acute or acuminate at apex, rounded at base ; petioles 0.3–0.5 cm long, hairy. Flowers white in axillary umbellate cymes. Drupes 1–1.5 cm in diameter, 4-lobed, fleshy, slightly hairy.

Fl. & Fr. : May – October.

Common in the dry forest outskirts before Old Courtallum.

4. *Grewia oppositifolia* Buch. *ex DC.*, *Prodr.* 1 : 509. 1824 (*non* Roxb.). *G. emarginata* *Wt. et Arn.*, *Prodr.* 79. 1834 ; *Mast. in Hook. f.*, *Fl. Brit. Ind.* 1 : 384. 1874 ; *Dunn in Gamble, Fl. Presid. Madras* 1 (1) : 117. 1915.

Trees, 3–5 m high ; young parts tomentose. Leaves 2.5 — 5.5 × 1.2 — 3 cm, roundish-obovate, serrate, slightly pubescent above, spreading tomentose beneath, cordate or obliquely rounded at base ; petioles 0.5–1 cm long. Flowers white, in mostly terminal or axillary umbellate cymes. Drupes 0.4–0.6 cm across, deeply 4-lobed, softly hairy.

Fl. & Fr. : April – September.

Fairly common in the dry outskirts of the reserve forest on the way to Five falls and above Chittaruvi.

5. *Grewia orientalis* Linn., *Sp. Pl.* 964. 1753 ; *Dunn in Gamble, Fl. Presid. Madras* 1 (1) : 117. 1915. *G. columnaris* Smith, *Rees Cyclop.* 17 no. 5. 1811 ; *Wt. et Arn.*, *Prodr.* 76. 1834 ; *Wt.*, *lc. t.* 44. 1838 ; *Mast. in Hook. f.*, *Fl. Brit. Ind.* 1 : 383. 1874. *Payippala* (Malayalam). *Adi-kullai* (Tamil).

Straggling shrubs ; young parts stellate pubescent. Leaves 2.5 — 5 × 1.5 — 2.5 cm, elliptic-oblong, serrate, crenate or dentate, stellate hairy above, glabrous beneath when mature, acute at apex, rounded at base ; petioles 0.3–0.5 cm long. Flowers white in terminal umbellate

cymes ; buds grey pubescent, dilated at base. Drupes 1 — 1.5 cm across, obscurely 4 lobed, with scattered stiff hairs.

Fl. & Fr. : April — October.

Fairly common in the shrubby and deciduous areas at Five falls.

6. *Grewia tiliifolia* Vahl, *Symb. Bot.* 1 : 35. 1790 ; Mast. in Hook. f., *Fl. Brit. Ind.* 1 : 386. 1874 (*pro parte*) ; Dunn in Gamble, *Fl. Presid. Madras* 1 (1) : 118. 1915. *Cattaci*, *Una* (Malayalam). *Cadacci*, *Unna*, *Cataci* (Tamil).

Trees, 6 — 8 m high ; young parts pubescent. Leaves 7.5 — 15 × 5 — 10.5 cm, rounded or oblong, bluntly toothed or serrate, glabrous above, glabrous or densely pubescent beneath, bluntly acute or rounded at apex, cordate, rounded or oblique at base ; petioles 1.5 — 3 cm long, pubescent. Flowers yellow in axillary umbellate cymes. Drupes 2 lobed or not lobed, equal to the size of a pea.

Fl. & Fr. : April — September.

Very common between Tiger falls and Old Courtallum.

3. *MICROCOS* Linn.

Microcos paniculata Linn., *Sp. Pl.* 514. 1753. *Grewia microcos* Linn., *Syst. ed.* 12 : 602. 1767 ; Wt. *et Arn.*, *Prodr.* 81. 1834 ; Wt., 111. *Ind. Bot.* t. 33. 1840 ; Mast. in Hook. f., *Fl. Brit. Ind.* 1 : 392. 1874 ; Dunn. in Gamble, *Fl. Presid. Madras* 1 (1) : 116. 1915. *Kottkka* (Malayalam). *Kadanbu*. *Vicalam* (Tamil).

Shrubs, 2 — 3.5 m high ; young branches stellate pubescent. Leaves 5.5 — 13 × 2 — 4.5 cm, elliptic oblong, entire, glabrous, acuminate at apex, ovate or acute and 3 nerved at base ; petioles 0.7 — 1 cm long, pubescent. Flowers pale white in terminal tomentose panicles. Drupes 0.5 — 0.8 cm across, globose or obovoid, entire, glabrous.

Fl. & Fr. : March — September.

Common along hedges below Tiger falls and in the outskirts of the forest on the way to Five falls.

25. STERCULIACEAE

- 1a. Flowers with 5 petals
 - 2a. Plants herbaceous
 - 3a. Style one ; capsule 2 - valved *Waltheria* 6
 - 3b. Styles five ; capsules 5 - valved *Melochia* 3
 - 2b. Plants shrubaceous or arborescent
 - 4a. Fruits of 2 - valved capsules ; plants fully glabrous *Lepronychia* 2
 - 4b. Fruits of 5 - valved capsules or spirally twisted follicles ; plants stellately pubescent or tomentose
 - 5a. Fruits of spirally twisted linear follicles ; leaves serrate *Helicteres* 1
 - 5b. Fruits 5 - valved ovoid or oblong capsules ; leaves entire towards base, lobed towards apex *Pterospermum* 4
- 1b. Flowers without petals *Sterculia* 5

1. *HELICTERES* Linn.

Helicteres isora Linn., Sp. Pl. 963. 1753 ; Wt. et Arn., Prodr. 60. 1834 ; Wt., Ic. t. 180. 1839 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 365. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 107. 1915. *Valampiri*, *Edampiri* - *valampiri* (Malayalam & Tamil).

Large shrubs or small trees, 3 — 5 m high ; branchlets densely tomentose. Leaves 5 — 15 × 4 — 10 cm, obovate, serrate, stellate hairy on both sides, shortly acuminate at apex, subcordate at base ; petioles 0.5 — 1 cm long, hairy. Flowers orange red, yellow when young in axillary fascicles. Follicles 2.5 — 5 cm long, spirally twisted, pointed, hairy.

Fl. & Fr. : August — March.

Fairly common at Old Courtallum, around the falls in shady areas. At Tiger falls area the plant is seen along hedges along the sides of small canals.

2. *LEPTONYCHIA* Turcz.

Leptonychia moacarroides Bedd., Fl. Sylvat. 1 : t. 114. 1871 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 379. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 112. 1915 ; Rolla Rao, J. Bombay Nat. Hist. Soc. 55 :

377. 1958. *Grewia acuminata* Bedd., Madras J. Sci. ser. 3, 1 : 39. 1864 & in Trans. Linn. Soc. Lond. 25 : 210. 1865 (non Juss. 1804). *Leptonychia acuminata* (Bedd.) Burret, Notizbl. Bot. Gart. Mus. Berl. 9 : 727. 1926 (non Mast. 1874). *Paragrewia poilanei* Gagnep., Suppl. Fl. Gen. Indo. Chine 1 : 1945 ; Rolla Rao, J. Bombay Nat. Hist. Soc. 51 : 671. 1953 & ibid. 52 : 190. 1954.

Large shrubs or small trees ; branches slender, glabrous. Leaves 6.5 — 14 × 2.5 — 6 cm, elliptic lanceate or oblanceate, membranous, entire, glabrous, abruptly or caudately acuminate at apex, obtuse or rounded at base ; petioles 0.5 — 0.8 cm long. Flowers solitary or in few flowered short axillary cymes. Capsules 1.5 — 1.8 cm across, subglobose or obovoid, irregularly 2 valved, verrucose or tubercled.

Fl. & Fr. : May—September.

Courtallum (Robert Wight 78, CAL).

3. MELOCHIA Linn.

Melochia corchorifolia Linn., Sp. Pl. 675. 1753 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 374. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1(1) : 110. 1915. *Riedleia corchorifolia* (Linn.) DC., Prodr. 1 : 491. 1824 ; Wt. et Arn., Prodr. 66. 1834. *Ceruvaram* (Malayalam). *Pinnkkuppundu* (Tamil).

Erect herbs, 30-60 cm high; branches reddish, glabrous or hairy. Leaves 1.3-4.5 × 1-2.5 cm, ovate to ovate-oblong, irregularly serrate, glabrous, obtuse or subacute at apex, subcordate at base ; petioles 0.5-1.5 cm long, hairy. Flowers yellow in terminal paniced or corymbose clusters. Capsules up to 0.4 cm in diameter, globose, hairy, reddish.

Fl. & Fr. : September—October.

A weed, often along the side of the dried Tippiakulam and elsewhere in waste places.

4. PTEROSPERMUM Schreb. *nom. gen. cons.*

- | | |
|--|--------------------------|
| 1a. Calyx lobes 2.5 - 3.5 cm long ; capsules not angled | <i>P. obtusifolium</i> 1 |
| 1b. Calyx lobes 4 - 5.5 cm long ; capsules obtusely 5 - angled | <i>P. xylocarpum</i> 2 |

1. *Pterospermum obtusifolium* Wt. ex Mast. in Hook. f., Fl. Brit. Ind. 1 : 369. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 108. 1915. *Mulipolak* (Malayalam).

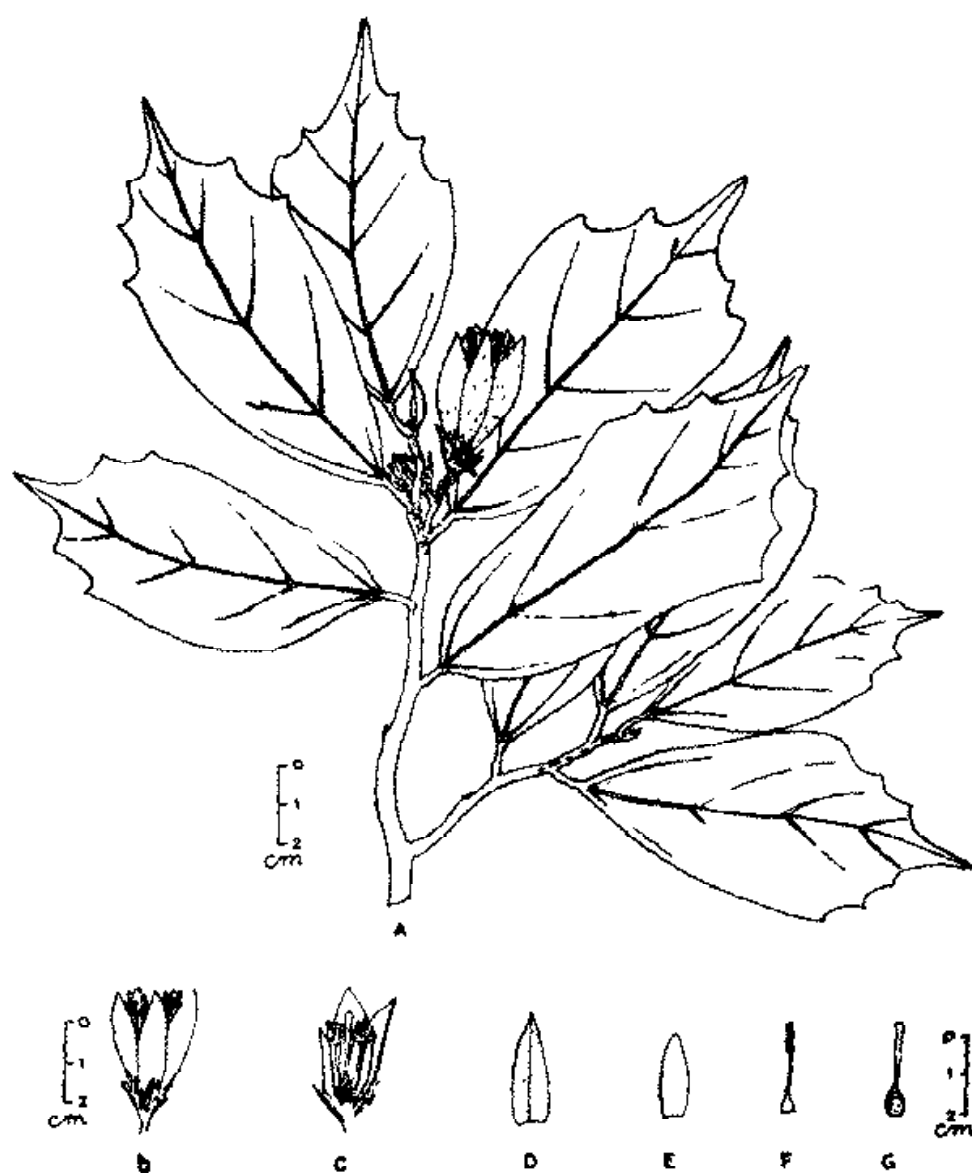


Fig. 1. *Pterospermum obtusifolium* Wt. ex Mast

A. Habit,	B. Flower,	C. L.S. of flower,	D. Sepal,
E. Petal,	F. Stamen,	G. Pistil.	

Evergreen trees, 5-6.5 m high ; young branches roughish-tomentose, brown. Leaves 6.5-20 × 2.5-7 cm, obliquely-obovate, coriaceous, somewhat distantly lobed towards apex, glabrous above, ashy-tomentose beneath obtuse or obtusely acuminate at apex, obtuse or narrowed at base; petioles 0.5-1.2 cm long, thick, tomentose. Flowers reddish-brown in axillary 1-3 flowered peduncles. Capsules 4-5.5 cm long, oblong, obtuse, furfuraceous.

Fl. & Fr. : March—December.

Very rare, by the side of the steps above Chittaruvi.

2. *Pterospermum xylocarpum* (Gaertn.) Sant. *et* Wagh, Bull. Bot. Surv. India 5 : 108. 1963. *Velago xylocarpa* Gaertn., Fruct. 2 : 245, t. 133. 1791. *Pterospermum heyneanum* Wall. *ex* Wt. *et* Arn., Prodr. 69. 1834 ; Wt., Ic. t. 489. 1841 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 369. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 108. 1915.

Trees, 6-15 m high ; young branches tomentose. Leaves 11-30 × 7.5-18 cm, peltate, roundish or variously shaped, entire or coarsely toothed, glabrous above, roughish tomentose beneath, palmately 7-12 nerved, cordate or subcordate at base ; petioles 5-8.5 cm long, tomentose. Flowers pale white, fragrant, tomentose in bud, in axillary cymes. Capsules up to 10.5 cm long, oblong, 5-angled, crusted when young.

Fl. & Fr. : February—June.

Fairly common in the thick shola on the way to Vaithamalai, below, Karuppuswamy Kovil, especially along the sides of the ravines.

5. STERCULIA Linn.

Sterculia guttata Roxb., (Hort. Beng. 50. 1814 *nom. nud.*) Fl. Ind. 3 : 148. 1832 ; Wt. *et* Arn., Prodr. 62. 1834 ; Wt. Ic. t. 487. 1841 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 355. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 106. 1915. *Kavalam*, *Pi*, *Ramanappu*, *Kavilli* (Malayalam). *Kithondi*, *Kavalam*, *Kaludaivedai*, *Tondi* (Tamil).

Large deciduous trees, 15-25 m high ; branches spreading ; branchlets rusty-tomentose. Leaves 10-20.5 × 4.5-12.5 cm, ovate-oblong, entire, glabrous above, pubescent beneath, bluntly acuminate at apex, rounded, truncate or subcordate at base ; petioles 3.5-4.5 cm long, densely rusty-tomentose. Flowers in terminal rusty-tomentose panicles : bracts prominent, lanceate—acute, rusty-tomentose. Follicles 6.7-9.2 × 4-5.2 cm, obovoid thick, reddish-brown tomentose externally, pink within.

Fl. & Fr. : October—March.

Common below Shembagadevi in the valleys along the sides of the stream.

6. WALTHERIA Linn.

Waltheria americana Linn., Sp. Pl. 673. 1753. *W. indica* Linn., Sp. Pl. 673. 1753 ; *Wt. et Arn.*, Prodr. 67. 1834 ; *Mast.* in *Hook. f.*, *Fl. Brit. Ind.* 1 : 374. 1874 ; *Dunn* in *Gamble*, *Fl. Presid. Madras* 1 (1) : 111. 1915.

Erect herbs, 60-90 cm high ; branches pubescent. Leaves 2.5-6.5 × 1.5-4.5 cm, ovate or elliptic, serrate, softly pubescent on both surfaces, obtuse at apex, rounded or subcordate at base. Flowers yellow in axillary and terminal heads. Capsules membranous, 2-valved.

Fl. & Fr. : October—March.

Common on the way to Five falls.

26. MALVACEAE

1a. Fruits schizocarpic

2a. Staminal column 5-toothed at apex, filaments produced from the whole length of the column ; bracteoles present, free or connate at base

3a. Merocarps glochidiate ; pedicels without any joint

Urena 7

3b. Merocarps muricate, prominently reticulately veined with three retrorsely hairy awns, never with spines ; pedicels jointed

Pavonia 4

2b. Staminal column without any teeth, at apex split up into numerous filaments ; bracteoles absent

4a. Seeds one per mericarp ; walls of the mericarps persistent releasing the seeds by withering of it or by dehiscence at the apex

Sida 5

4b. Seeds 2 or more per mericarp ; mericarps follicular, dehiscent at maturity of the fruit

Abutilon 2

1b. Fruits loculicidal capsules

5a. Style distantly divided into 5 ultimately spreading branches ; plants shrubaceous

6a. Calyx not adnate to the corolla, persistent after flowering

Hibiscus 3

- 6b. Calyx adnate to the corolla, falling off with the corolla after flowering *Abelmoschus* 1
- 5b. Style undivided, at apex with a ribbed or lobed stigma ; plants arborescent *Thespesia* 6

1. ABELMOSCHUS Med.

Abelmoschus moschatus Med., Malv. 46. 1787 ; Borssum Waalkes, Blumea 14 : 90. 1966. *Hibiscus abelmoschus* Linn., Sp. Pl. 696. 1753 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 97. 1915. *H. rugosus* (Wt. et Arn.) Mast. in Hook. f., Fl. Brit. Ind. 1 : 342. 1874. *Abelmoschus rugosus* Wt. et Arn., Prodr. 53. 1834.

Deflexed, hairy shrubs, 0.5-1 m high ; bark fibrous. Leaves variable, the lower ones palmately 3-7 lobed, the upper ones ovate or lanceate, 6-15 cm long, coarsely serrate or dentate, cordate or rounded at base ; petioles 4.5-15 cm long, slender. Flowers yellow with a red base, solitary, axillary ; involueral bracteoles 8-12, 1-1.5 cm long. Capsules 3-6 cm long, oblong, acute ; seeds reniform, striated.

Fl. & Fr. : June—February.

Rare, along the sides of the small canal above Chittaruvi, on the way to Shembagadevi.

2. ABUTILON Mill.

Abutilon indicum (Linn.) Sweet, Hort. Brit. ed. 1 : 54. 1826 ; Wt. et Arn., Prodr. 56. 1834 ; Wt., Ic. t. 12. 1838 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 326. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 91. 1915 ; Borssum Waalkes, Blumea 14 : 170. 1966. *Sida indica* Linn., Torner. Cent. Pl. 2 : 26. 1756. *Katturan, Pittikkappattu, Turvatti, Uran, Velluram* (Malayalam). *Tutti, Nalattuti Paniyarattuti, Perundutti* (Tamil).

Robust undershrubs, 0.5-2 m high ; branches minutely simple and stellate hairy. Leaves 3-6.5 × 2-5.5 cm, ovate-orbicular, crenate or dentate acuminate at apex, cordate at base ; petioles often longer than the lamina. Flowers yellow, solitary, axillary ; bracteoles absent. Schizocarps globular ; mericarps 15-20, each with a distinct acute point.

Fl. & Fr. : August—February.

Common in the dry outskirts around Tiger falls, Main falls and on the way to Five falls.

3. *HIBISCUS* Linn. *nom. gen. cons.*

- 1a. Prickly straggling or trailing shrubs *H. surattensis* 4
- 1b. Stellate - hairy, sparsely - villous or pubescent erect herbs or shrubs
- 2a. Leaves 3 - 5 lobed or 3 - 5 partite
- 3a. Flowers white ; plants herbaceous, 30 - 80 cm high *H. lobatus* 1
- 3b. Flowers yellow ; plants shrubaceous, 3 - 4.5 m high *H. lunarifolius* 2
- 2b. Leaves not lobed, ovate, serrate, cordate at base *H. micranthus* 3

1. *Hibiscus lobatus* (Murr.) O. Ktze., Rev. Gen. Pl. 3, 2 : 19. 1898 ; Borssum Waalkes, *Blumea* 14 : 77. 1966 ; Rakshit *et* Kundu, *Bull. Bot. Surv. India* 12 : 169. 1970. *Solandra lobata* Murr., *Comm. Soc. Reg. Sc. Goetting.* 6 : 20, t. 1. 1785. *Hibiscus solandra* L' Herit., *Strip. Nov.* 1 : 103, t. 49. 1788 (*nom. illeg.*) ; Mast. in Hook. f., *Fl. Brit. Ind.* 1 : 336. 1875 ; Dunn in Gamble *Fl. Presid. Madras* 1 (1) : 98. 1915.

Erect herbs, 30-80 cm high ; stem and branches pubescent or simple or stellate hairy. Leaves 2-7.5 × 1.5-5.5 cm, orbicular or ovate, 3-lobed or 3-partite with linear-lanceate lobes, appressed short simple hairy above, shortly appressed-hairy beneath. Flowers white in terminal racemes. Capsules about 1.2 cm long, hairy.

Fl. & Fr. : July—February.

Fairly common around Chittaruv.

2. *Hibiscus lunarifolius* Willd., Sp. Pl. 3 : 811. 1800 ; Wt. *et* Arn., Prodr. 49. 1834 ; Wt., *lc.* t. 6. 1838 ; Mast. in Hook. f., *Fl. Brit. Ind.* 1 : 338. 1875 ; Dunn in Gamble, *Fl. Presid. Madras* 1 (1) : 98. 1915 ; Borssum-Waalkes, *Blumea* 14 : 80. 1966 ; Rakshit *et* Kundu, *Bull. Bot. Surv. India* 12 : 173. 1970. *H. sidoides* Wt. *et* Arn., *Prodr.* 494. 1834.

Erect shrubs, 3-4.5 m high ; young parts simple and stellate hairy. Leaves 7.5-16 cm in diameter, orbicular-cordate to ovate-lanceate, serrate, hairy beneath along the nerves, glabrous when mature, shallowly 3-5 lobed with wide sinus ; lobes wedge-shaped ; petioles as long as or longer than the blade, pubescent. Flowers yellow in terminal leafless racemes, 6-10 cm in diameter. Capsules ovoid, hairy when young, at length glabrous ; seeds reniform, stellate hairy.

Fl. & Fr. : October—January.

Fairly common along the sides of Chittar in the lower altitudes of Tekkumalai and above Honey falls in the humus soil.

3. *Hibiscus micranthus* Linn. f., Suppl. 308. 1781 ; Wt. et Arn., Prodr. 51. 1834 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 335. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1(1) : 97. 1915 ; Rakshit et Kundu, Bull. Bot. Surv. India 12 : 171. 1970. *Cirramutti* (Tamil).

Erect herbs, 30-60 cm high ; branches slender, stellate-hairy. Leaves very variable, 2.5-5.2 cm long, ovate, serrate, acute or obtuse at apex, cordate at base ; petioles 1.5-2.5 cm long. Flowers white or pinkish, solitary, axillary. Capsules \pm 0.7 cm in diameter, globose ; seeds reniform, cottony-hairy.

Fl. & Fr. : August-February.

Gregarious at Five falls along the sides of the road leading to Agricultural estate.

4. *Hibiscus surattensis* Linn., Sp. Pl. 696. 1753 ; Wt. et Arn., Prodr. 48. 1834 ; Wt., Ic. t. 197. 1839 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 334. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 97. 1915 ; Borssum Waalkes, Blumea 14 : 57. 1966 ; Rakshit et Kundu, Bull. Bot. Surv. India 12 : 160. 1970.

Straggling or trailing, prickly shrubs, 2-4.5 m long ; bark fibrous. Leaves 4.5-6.5 cm long, suborbicular, ovate or palmately 3-5 lobed, hairy, cordate at base ; lobes linear-lanceate, acute, serrate along the margins ; petioles 3-8 cm long, prickly. Flowers yellow with a deep red centre, solitary, axillary or terminal ; involueral bracts spatulate-apiculate, prickly, persistent. Capsules 1-1.2 cm long, ovoid, covered with white or yellow bristle-like hairs.

Fl & Fr. : August-February.

A common weed above Chittaruvi and on the way to Shembagadevi.

4. PAVONIA Cav. *nom. gen. cons.*

Pavonia odorata Willd., Sp. pl. 3 : 837. 1800 ; Wt. et Arn., Prodr. 47. 1834 ; Mast. in Hook. f. Fl. Brit. Ind. 1: 331. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 93. 1915. *Karumthotti* (Malayalam). *Avibattam*, *Cuvecagam*, *Peramutti* (Tamil).

Straggling undershrubs, up to 1 m high ; young parts viciidly hairy. Leaves 3.5-4.5 x 2.2-3.5 cm, cordate-ovate, with 3-5 shallow pointed lobes ; lobes toothed distantly, hairy and viscid on both surfaces ; petioles 2.5-3

cm long, hairy. Flowers white with light red tinge, axillary, solitary, somewhat racemose towards apex of the stem. Fruits schizocarpic ; carpels 5-3, obovoid, covered by persistent calyx and bracteoles.

Fl & Fr. : July-February.

A common undergrowth in the Teak plantations on the way to Five falls.

5. *SIDA* Linn.

- 1a. Styles and mericarps 5 ; mericarps without prominent reticulate venation, not dehiscent ; leaves palminerved *S. mysorensis* 3
- 1b. Styles and mericarps 5-10 ; mericarps prominently reticulately veined outside, dehiscent at the apex ; leaves penninerved
- 2a. Green parts sparsely hairy, soon glabrescent ; stipules of each pair different, one linear to linear-lanceate, other linear to filiform *S. acuta* 1
- 2b. Green parts stellate hairy ; stipules of every pair not different
- 3a. Mericarps with or without awns, the awns retrorsely hairy ; leaves rhomboid, cuneate at base *S. rhombifolia* 4
- 3b. Mericarps always with awns, the awns retrorsely hairy ; leaves ovate or oblong, cordate or suborbiculate at base *S. cordifolia* 2

1. *Sida acuta* Burm. f., Fl. Ind. 147. 1768, *emend* K. Schum., Fl. Bras. 12 (3) : 326. 1891 ; Wt. et Arn., Prodr. 57. 1834 ; Wt. Ic. t. 95. 1838 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 90. 1915 ; Borssum Waalkes, Blumea 14 : 186. 1966. *S. carpinifolia* Mast. in Hook. f. Fl. Brit. Ind. 1 : 323. 1875. (*non* Linn. f., 1781). *Cheruparuva*, *Malatanni* (Malayalam). *Arivalmannaipundu*, *Arivalmukkam*, *Malaidangi* (Tamil).

Much branched undershrubs, 30-40 cm high : stem woody, glabrous. Leaves 3-6 × 1-2 cm, lanceate, serrate, glabrous, acuminate at apex, rounded at base ; petioles up to 0.6 cm long. Flowers yellow, axillary, solitary below, clustered above. Schizocarps ± 0.5 cm in diameter, globose, covered by persistent calyx.

Fl. & Fr. : Almost throughout the year.

A common weed in the cleared areas around Five falls.

2. *Sida cordifolia* Linn., Sp. Pl. 684. 1753; Wt. et Arn., Prodr. 58. 1834; Mast. in Hook. f., Fl. Brit. Ind. 1 : 324. 1875; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 89. 1915; Borssum Waalkes, Blumea 14 : 199, 1966. *Katturan* (Malayalam). *Arivalannaippundu*, *Nilattuti* (Tamil)

Much branched herbs or undershrubs, 30-60 cm high; stem woody, pubescent. Leaves 1.5-5 × 0.5-4.5 cm, ovate to oblong, serrate or crenate, subobtusate at apex, shallowly cordate or orbicular at base; petioles 2-5 cm long. Flowers yellow, axillary, solitary or clustered. Schizocarps 0.6-0.8 cm in diameter, globose, covered by persistent calyx; seeds 0.2 cm across, brown.

Fl. & Fr. : June-February.

Fairly common in the cleared areas of the forest at Five falls.

3. *Sida mysorensis* Wt. et Arn., Prodr. 59. 1834; Mast. in Hook. f., Fl. Brit. Ind. 1 : 322. 1875; Borssum Waalkes, Blumea 14 : 180. 1966. *S. urticifolia* Wt. et Arn., Prodr. 59. 1834 (*non* St. Hill, 1828). *S. glutinosa* Roxb. (Hort. Beng. 97. 1814 *nom. nud.*) Fl. Ind. 3 : 172. 1832 (*non* Cav., 1786); Dunn in Gamble, Fl. Presid. Madras 1 (1) : 89. 1915. *Arivalmanaippundu* (Tamil).

Erect herbs or undershrubs, 30-90 cm high; branchlets stellate-hairy. Leaves 3.5-6.5 × 2-4 cm, ovate, sharply serrate to crenate, hairy on both sides, acuminate at apex, shallowly cordate at base; petioles up to 3.5 cm long. Flowers yellow in condensed racemes or panicles. Mericarps 5, tetrahedral, up to 0.2 cm long, acute.

Fl. & Fr. : October-March.

Common in Tekkumalai and around Kailasa mottai.

4. *Sida rhombifolia* Linn., subsp. *rhombifolia*; Borssum Waalkes, Blumea 14 : 195. 1966. *S. rhomboidea* Roxb. ex Flem., As. Res. 6 : 178. 1810; Wt. et Arn., Prodr. 57. 1834; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 90. 1915. *Anakurumthotti*, *Kurumthotti*, *Vatturam* (Malayalam). *Teneccam*, *Anaikkurumthotti* (Tamil).

Spreading shrubs, 30-80 cm long; stem woody. Leaves 3-6 × 3-4 cm, rhomboid, serrate or crenate, glabrous above, slightly tomentose beneath, acute or obtuse at apex, cuneate at base; petioles up to 1.2 cm long. Flowers yellow, axillary, solitary or in clusters of 2-5. Schizocarps ± 0.5 cm in diameter, globose, covered by persistent calyx and bracteoles.

Fl. & Fr. : Almost throughout the year.

Fairly common at Tekkumalai and Five falls.

6. *THESPESIA* Soland. ex Correa nom. gen. cons.

Thespesia populnea (Linn.) Soland. ex Correa, Ann., Mus. Herb. Paris. 9 : 290. t. 8. f. 1. 1807 ; Wt. et Arn., Prodr. 32. 1834 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 345. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 101. 1915 ; Borssum Waalkes, Blumea 14 : 106. 1966. *Hibiscus populneus* Linn., Sp. Pl. 694. 1753. *Cilanti*, *Pupparutti*, *Kallal*, *Puvaracu* (Malayalam). *Kallal*, *Piram* (Tamil).

Trees, 3-6m high ; younger parts short-hairy. Leaves 8-13 × 6-10 cm, ovate, entire, glabrous, acuminate at apex, deeply cordate at base ; petioles 5-10 cm long. Flowers yellow, 5-8 cm across, solitary, axillary. Capsules ± 2 cm in diameter, globose, with persistent calyx.

Fl. & Fr. : May-February.

Often grown as shade trees in Courtallum Township, but occasionally running wild on the way to Five falls.

7. *URENA* Linn.

Urena lobata Linn., Sp. Pl. 692. 1853 (*sensu lato*) ; Wt. et Arn., Prodr. 46. 1834 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 329. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 92. 1915 ; Borssum Waalkes, Blumea 14 : 138. 1966.

Undershrubs, 0.5-1.2 m high ; branches stellate-hairy. Leaves very variable in shape and size, 3.5-9.5 × 3-8 cm, orbicular to palmilobed or penniparted, serrate or crenate ; petioles 3-5.5 cm long. Flowers rose or pink coloured, axillary, solitary or in 2-3 flowered clusters. Schizocarps compressed, globular, spinose.

1a. Epicalyx cupular in fruit, appressed to the mericarps ; segments long triangular acute ; plants stouter ; leaves ovate to lanceate, angular or shallowly lobed

var. lobata 1

1b. Epicalyx spreading in fruit ; segments linear to lanceate, acute ; plants slender ; leaves deeply palmilobed, often doubly incised

var. sinuata 2

1. *var. lobata* - *Urena lobata* Linn., Sp. Pl. 692. 1753 ; Borssum Waalkes, Blumea 14 : 140. 1966. *Uram*, *Udiram*, *Vatti* (Malayalam). *Ottuttuti*, *Otratti* (Tamil).

Fl & Fr. : May- February.

Common in the higher altitudes of Tekkumalai.

2. var. *sinuta*-*Urena sinuta* Linn., Sp. Pl. 692. 1753 ; Wt. et Arn., Prodr. 46. 1834 ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 329. 1875 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 92. 1915 ; Borssum Waalkes, Blumea 14 : 142. 1966. *Uran* (Malayalam). *Ottuti* (Tamil).

Fl. & Fr. : May-February.

Rare, in the outskirts of the forests and waste places around Tiger falls.

27. LECYTHIDACEAE

CAREYA Roxb. *nom. gen. cons.*

Careya arborea Roxb., Pl. Corom. 3 : 14, t. 218. 1819 ; Wt. et Arn., Prodr. 334. 1834 ; Wt., Ill. Ind. Bot. tt. 99, 100. 1840 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 511. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 488. 1919. *Pezhu* (Malayalam). *Ayma* (Tamil).

Deciduous trees, 4-8 m high; bark fibrous, thick. Leaves aggregated towards apex of branchlets, 20-30 × 6-12 cm, obovate, entire, glabrous, rounded at apex, narrowed at base ; petioles 1.5-2 cm long, often obscurely winged. Flowers yellowish white, foul-smelling, large in terminal cymes. Berries 5-6.5 cm in diameter, globose, glabrous, green, crowned by persistent calyx and style-base.

Fl. & Fr. : March-July.

Rather common in the outskirts of the reserve forests on the way to Old Courtallum and around Five falls.

28. DROSERACEAE

DROSERA Linn.

Drosera burmanni Vahl, Symb. Bot. 3: 50. 1794; Wt. et Arn., Prodr. 34. 1834; Wt., Ic. t. 944. 1845; Clarke in Hook. f., Fl. Brit. Ind. 2 : 424. 1878 ; Diels in Engl., Pflanzenr. 112 : 75. 1906; Gamble, Fl. Presid. Madras 1 (3) : 452. 1919.

Herbs with rosulate leaves and erect scapes, 5.5-8.5 cm high. Leaves radical, 0.4-1.3 cm long, spatulate, entire, gland-tipped hairy above,

rounded at apex, cuneate at base ; petioles flat, merging with the blade ; stipules 3-parted ; segments lanceate-acute. Flowers white in racemose or cymose scapes. Capsules \pm 0.2 cm long, 5 valved.

Fl. & Fr. : August—February.

Insectivorous plants in semiaquatic habitats near streams below Shembagadevi.

29. FLACOURTIACEAE

1a. Armed shrubs or trees

2a. Flowers bisexual ; petals 4 - 6 ; anthers not versatile *Scolopia* 4

2b. Flowers unisexual and dioecious ; petals absent ; anthers versatile *Flacourtia* 2

1b. Unarmed trees

3a. Flowers solitary ; petals 5 ; fruits berries *Hydnocarpus* 3

3b. Flowers in racemes ; petals absent ; fruits capsular *Casearia* 1

1. CASEARIA Jacq.

Casearia bourdillonii Mukherjee, Bull. Bot. Soc. Bengal 19 (2) : 109. 1965. *C. varians* Bedd., Fl. Sylvat. t. 208. 1873 (*non* Thw.) ; Gamble, Kew Bull. 1920 : 56. 1920 & in Fl. Presid. Madras 1 (3) : 521. 1919.

Trees ; bark greyish, smooth ; branches glabrous. Leaves 7.5-15.5 × 2.5-5 cm, elliptic lanceate, chartaceous when old, entire, glabrous, acute or acuminate at apex, cuneate at base ; main nerve prominent with 9-11 lateral ribs ; stipules foliaceous, deciduous. Flowers in pubescent, axillary, racemose clusters. Capsules 0.9-2.5 cm long, subglobose, opening by two valves.

Fl. & Fr. : April-August.

Courtallum (*Robert Wight* 743, CAL).

2. FLACOURTIA Comm. ex L'., H'erit.

Flacourtia indica (Burm. f.) Merr., Interpr. Herb. Amb. 277. 1917 ; Sant., Bull. Bot. Surv. India 3: 16. 1961, *Gmelina indica* Burm. f., Fl. Ind. 132, t. 39, f. 5. 1768. *Flacourtia ramontchi* L' H'erit., Strip. Nov. 3 : 59, t. 30 & 30 B. 1785 ; Hook. f. et Thoms. in Hook. f., Fl. Brit.

Ind. 1 : 193. 1872 (incl. vars. *latifolia* Hook. f. et Thoms. & *occidentalis* Hook. f. et Thoms.). *F. sepiaria* Roxb., Pl. Corom. 1 : 48, t. 68. 1795 ; Wt. et Arn., Prodr. 29. 1834 ; Hook. f. et Thoms. *loc. cit.* ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 54. 1915. *Kurumuli* (Malayalam). *Cottai-kkala*, *Kodumundi* (Tamil).

Much branched thorny shrubs, 1-2 m high ; thorns straight, 2-3 cm long, with flowers and fruits on it. Leaves 1.5-4.5 x 1-1.5 cm, elliptic or obcordate, crenate - serrate, glabrous, obtuse at apex, cuneate or narrowed at base ; petioles 0.5-0.7 cm long. Flowers greenish-yellow in short racemes, mostly on thorns or axillary. Fruits 0.2-0.4 cm in diameter smooth, indehiscent.

Fl. & Fr. : January—May.

Common in the dry outskirts of the forest between Tiger falls and Five falls.

3. *HYDNOCARPUS* Gaertn.

- 1a. Leaves shallowly serrate ; petals glabrous ; nervules of the leaves parallel *H. pentandrus* 2
1b. Leaves entire ; petals ciliate ; nervules of the leaves reticulate *H. alpina* 1

1. *Hydnocarpus alpina* Wt., Ic. t. 942. 1845 ; Benth. et Hook. f. in Hook. f., Fl. Brit. Ind. 1 : 197. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 52. 1915 ; Sleum., Bot. Jahrb. 69 : 79. 1938. *Attuchankali*, *Arrucancali*, *Malaivatti*, *Vattai* (Tamil).

Large trees, 12-20 m high ; trunk buttressing ; branchlets yellowish tomentose. Leaves 5.5-17.5 x 1.8-4.5 cm, linear elliptic, entire, glabrous, long acuminate at apex, acute at base ; nervules reticulate ; petioles 0.5-0.7 cm long, thick. Flowers greenish, solitary, axillary. Berries up to 8 cm in diameter, globose.

Fl. & Fr. : February-November.

Rare, below Tiger falls.

2. *Hydnocarpus pentandrus* (Ham.) Oken, Allg. Naturgesch. 3 (2) : 1381. 1841 ; Merrill, J. Arnold Arbor. 31 : 279. 1950 ; K.K.N. Nair, J. Bombay Nat. Hist. Soc. 80 : 452-453. 1984. *Chilmoria pentandra* Ham., Trans. Linn. Soc. Lond. 13 : 501. 1822. *Hydnocarpus wightiana* Bl., Rumph. 4 : 22. 1848 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 196. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 52. 1915. *H. laurifolia* (Dennst.) Sleum., Bot. Jahrb. 69 : 33. 1939. *Munnicksia lauri*

folia Dennst., Schlüssel zum Hort. Malab. 13 : 27. 1818, c.f. Hassk., Flora 45 : 44. 1862. *Hydnocarpus inebrians sensu non Vahl* ; Wt. et Arn., Prodr. 30. 1834 ; Wt., Ill. Ind. Bot. t. 16. 1840. *Maravetti*, *Kotti*, *Neeralam*, *Nirvetti*, *Vetti* (Malayalam). *Maravatti*, *Niradimullu*, *Valai*, *Kotti*, *Nirvatti* (Tamil).

Large trees, 20-25 m high : young branches pubescent. Leaves 16.5-21.5 × 3.5-5.2 cm, oblong-lanceate, coriaceous, shallowly and obscurely serrate, glabrous, acuminate at apex, acute at base ; nervules parallel ; petioles \pm 1.3 cm long, stout. Flowers greenish, solitary, terminal. Berries 4.5-7.5 cm in diameter, globose.

Fl. & Fr. : August March.

Fairly common above Five falls in the sholas along the sides of the stream.

4. *SCOLOPIA* Schreb. *nom. gen. cons.*

Scolopia crenata (Wt. et Arn.) Clos, Ann. Sci. Nat. (ser. 4) 8 : 250. 1857 (excl. specim. Philippn.) ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 191. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 52. 1915 ; Sleum., Blumea 20 : 39. 1972. *Phoberos crenatus* (Wt. Cat. no. 63. 1833 *nom. nud.*) Wt. et Arn., Prodr. 30. 1834. *Scolopia wightiana* (Wt. et Arn.) Clos, Ann. Sci. Nat. (ser. 4) 8 : 252. 1857 ; Glig in Engl. & Prantl, Pflanzenfam. (ed. 2) 2 : 420. 1925. *Charalu* (Malayalam). *Charalu*, *Kodali*, *Terunai*, *Aeccaralu* (Tamil).

Trees, 5-6 m high, with occasional, fine axillary thorns on young twigs. Leaves 5.3 — 12.2 × 2.5 — 4.6 cm, oblong-lanceate, shallowly serrate or crenate, coriaceous, glabrous, shining above, acuminate at apex, cuneate at base. Flowers white, many in axillary or terminal racemes or narrow panicles.

Fl. : July August.

Rare, along the sides of the river Chittar in Tekkumalai.

30. VIOLACEAE

HYBANTHUS Jacq. *nom. gen. cons.*

Hybanthus enneaspermus (Linn.) F. Muell., Fragm. 10 : 81. 1877 & in Census. Austr. Pl. 1 : 6. 1882 ; Melchior in Engl. & Prantl, Pflanzenfam. (ed. 2) 21 : 359. 1925 ; Tennant, Kew Bull. 16 : 431. 1962. *Viola*

enneasperma Linn., Sp. Pl. 937. 1753. *Ionidium suffruticosum* (Linn.) Roem. et Schult., Syst. Veg. 5 : 394. 1819 ; Wt. et Arn., Prodr. 32. 1834 ; Wt., Ic. t. 308. 1840 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 185. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 48. 1915. *Hybanthus suffruticosus* (Linn.) Baill., Bot. Med. 2 : 841. 1884. *Viola suffruticosa* Linn., Sp. Pl. 937. 1753.

Erect herbs, 12 - 30 cm high ; branches woody, pubescent. Leaves sessile, 3.5 — 5 × 0.5 — 0.8 cm, linear or lanceate, serrate, glabrous, acute at apex, tapering towards base. Flowers red, solitary, axillary. Capsules up to 1.6 cm long, subglobose ; seeds many, ovoid, longitudinally striated.

Fl. & Fr. : August February.

A common weed around Main falls in rocky soil.

31. PASSIFLORACEAE

- | | |
|--|---------------------|
| 1a. Flowers hermaphrodite ; corona conspicuous | <i>Passiflora</i> 2 |
| 1b. Flowers unisexual ; corona inconspicuous or absent | <i>Adenia</i> 1 |

1. ADENIA Forssk.

Adenia hondala (Gaertn.) de Wild., Blumea 15 : 265. 1967. *Granadilla hondala* Gaertn., Fruct. 2 : 480, t. 180, f. 10. 1791. *Breynia palmata* Linn., Sp. Pl. 1012. 1753 & ibid. 2 : 1438. 1763. *Modecca palmata* Lamk., Enc. Meth. Bot. 4 : 209. 1794 ; Wt. et Arn., Prodr. 353. 1834 ; Wt., Ic. t. 201. 1839 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 603. 1878. *Adenia palmata* (Lamk.) Engl., Bot. Jahrb. 14 : 375. 1891 ; Gamble, Fl. Presid. Madras 1 (3) : 525. 1919 ; Chakraborty, Bull. Bot. Soc. Bengal 3 (2) : 69. 1949. *M. tuberosa* Roxb., (Hort. Beng. 49. 1814 nom. nud.) Fl. Ind. 134. 1832. *Muttakka* (Malayalam).

Climbing undershrubs ; tendrils unbranched ; stem terete, striated. Leaves palmately 3 - 5 lobed, up to 12 cm long, glabrous, cordate at base ; lobes oblong lanceate, acuminate at apex, narrowed at base ; petioles ± 4.5 cm long, slender, glandular at apex. Flowers unisexual in axillary cymes. Pepo up to 4 cm long, subglobose ; seeds reniform with small funicular beak.

Fl. : July August.

Courtallum (Robert Wight 321 ; C.A. Barber 3322, CAL).

2. PASSIFLORA Linn.

Passiflora foetida Linn., Sp. Pl. 959. 1753 ; Gamble, Fl. Presid. Madras 1 (3) : 524. 1919 ; Chakraborty, Bull. Bot. Soc. Bengal 3 (2) : 57. 1949. *Ciruppunaikkali* (Tamil).

Climbing herbs, with tendrils ; stem yellowish hairy, foetid. Leaves 5 — 7.5 × 3 — 7 cm, ovate, usually 3 lobed, membranous, shortly acuminate at apex, cordate at base ; petioles 3 — 4.5 cm long. Flowers white, solitary, axillary. Pepo 1.5 — 2.5 cm across, globose or subglobose, yellow when ripe ; seeds discoid, arillate.

Fl. & Fr. : Almost throughout the year.

Rare, in the outskirts of the forest around Five falls.

32. ANCISTROCLADACEAE

ANCISTROCLADUS Wall. ex Arn. *nom. gen. cons.*

Ancistrocladus heyneanus Wall. ex Garh., Cat. Pl. Bomb. & Vicin. 28. 1839 ; Wt., Ic. tt. 1987 88. 1853 ; Dyer in Hook. f., Fl. Brit. Ind. 1 : 299. 1874 ; Gilg in Engl. & Prantl, Pflanzenfam. (ed. 2) : 589. 1925 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 86. 1915. *Karatolal* (Malayalam).

Erect or climbing shrubs ; branches often dimorphic, hooked. Leaves sessile, 14.5 — 17 × 4.5 — 6 cm, elliptic oblong, coriaceous, entire, glabrous, subacuminate at apex, narrowed into the stout vein towards the base. Flowers small in terminal panicles. Nuts 3 ± cm long, conical, with persistent and accrescent calyx.

Fl. & Fr. : February May.

Courtallum (Robert Wight 107, CAL).

33. BEGONIACEAE

BEGONIA Linn.

1a. Scapigerous herbs ; leaves peltate

B. alba - coccinea 1

1b. Non - scapigerous herbs or undershrubs ; leaves unequally ovate - cordate

B. malabarica 2

1. *Begonia albo-coccinea* Hook., Bot. Mag. t. 4172. 1845; Clarke in Hook. f., Fl. Brit. Ind. 2 : 654. 1879; Gamble, Fl. Presid. Madras 1 (3) : 546. 1919. *B. grahamiana* Wt., Ic. t. 1811. 1852.

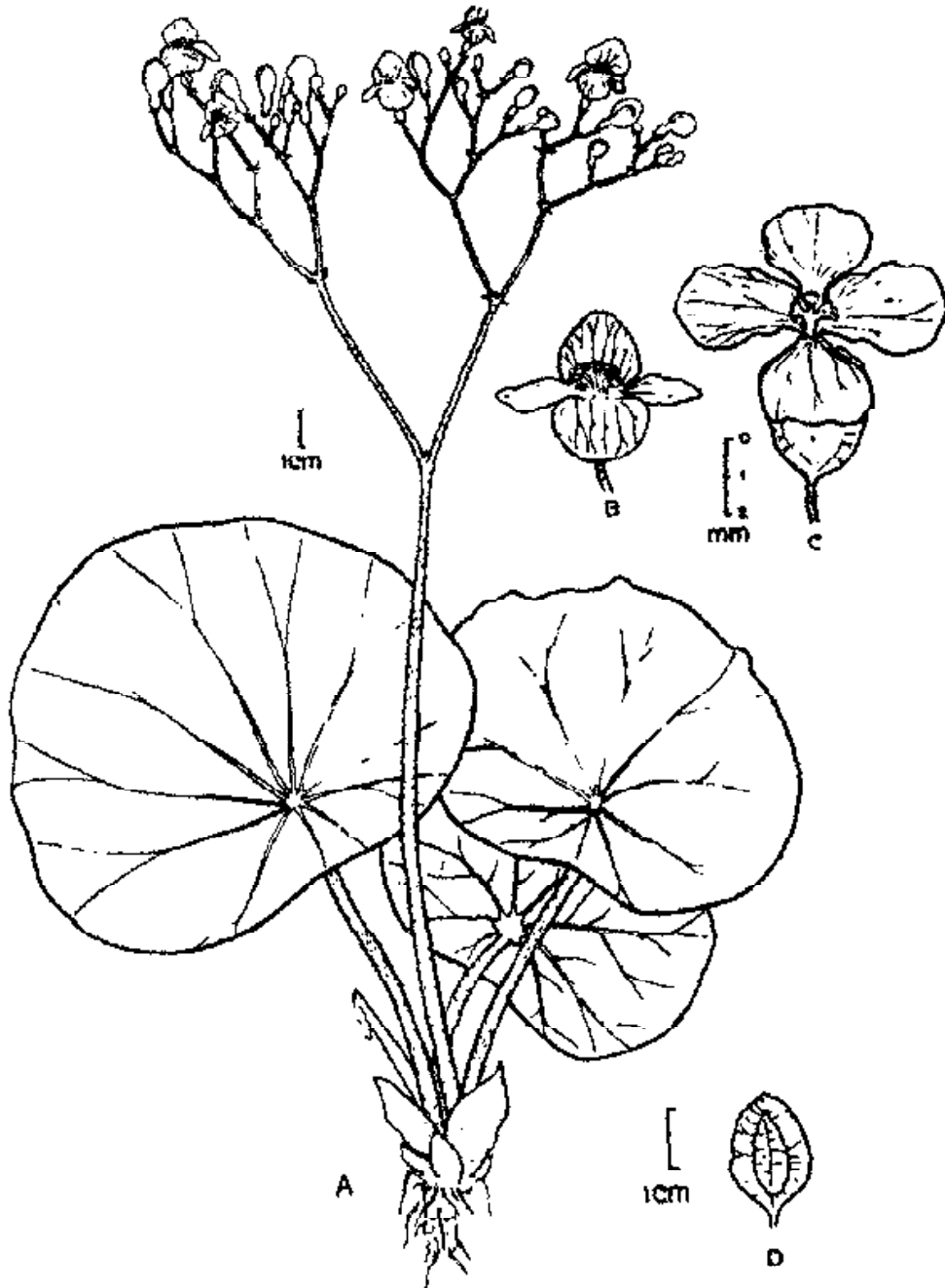


Fig. 2 *Begonia albo-coccinea* Hook.

A. Habit, B. Male flower, C. Female flower, D. Fruit.

Scapigerous herbs ; rootstock elongate, thick. Leaves peltate, 10 — 14.5 cm across, reniform orbicular, broader than longer, entire with bulgings along the margins, glabrous when mature ; stipules up to 4 cm long, lanceate, glabrous. Flowers unisexual in scapose inflorescence ; peduncles 10 — 22 cm long ; bracts and pedicels pubescent ; petals two, elliptic ; stamens about 40, monadelphous ; female flowers with slightly tomentose ovary ; styles 3. Capsules 2.5×1.7 cm, winged ; wings 2. prominently reticulate.

Fl. & Fr. September — March.

Courtailum (*M. Rama Rao* 1752 ; *Robert Wight s. n.*, 1030, CAL).

2. *Begonia malabarica* Poir. in Lamk., Enc. Meth. Bot. 1 : 393. 1785 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 655. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 546. 1919. *Diploclinium lindleyanum* Wt., Ic. t. 1817. 1852. *Begonia fallax* DC., Prodr. 15 : 329. 1864.

Erect, branched herbs or undershrubs, 30-90 cm high ; stems jointed, somewhat succulent, reddish, glabrous. Leaves up to 17×7.5 cm, unequally ovate-cordate, irregularly or distantly serrate or crenate, rarely entire with few angular points, membranous, glabrous or slightly scabrid, acuminate at apex. Flowers rose-coloured with prominent yellowish anthers in few to many-flowered axillary dichotomous cymes, shorter than the leaves. Capsules up to 2.2 cm long, equally broad, winged, rounded or truncate at apex, narrowed at base ; wings obscurely nerved.

Fl. & Fr. : May—March.

A common undergrowth in the thick shady forest floor of Tekkumalai, below Shembagadevi and on the way to Vaithamalai, around Karuppuswamy kovil.

34. CUCURBITACEAE

- | | |
|--|------------------------|
| 1a. Anthers flexuous or conduplicate | |
| 2a. Petals long fimbriate at their margins | <i>Trichosanthes</i> 3 |
| 2b. Petals entire | <i>Momordica</i> 1 |
| 1b. Anthers straight or curved, not flexuous or conduplicate | |
| 3a. Stamens 3, all 2-theous | <i>Zehneria</i> 4 |
| 3b. Stamens 3, two 2-theous and one 1-theous | <i>Mukia</i> 2 |

1. MOMORDICA Linn.

Momordica dioica Roxb. ex Willd., Sp. 4 : 605. 1805 ; Wt. et Arn., Prodr. 348. 1834 ; Wt., Ic. t. 505, 506. 1841 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 616. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 532. 1919 ; Chakraborty, Rec. Bot. Surv. India 17 (1) : 91. 1959.

Tendril climbing herbs, up to 3 m high ; stem slender, striated, glabrous ; tendrils simple. Leaves 4-7.5 × 3.5-6.5 cm, 3-5 lobed, slightly serrate, glabrous, deeply emarginate at base ; lobes oblong, acute ; petioles 1-2.5 cm long, slender, puberulous, eglandular. Flowers yellow, dioecious ; male flowers bracteate ; female flowers ebracteate. Fruits 3-4.5 cm long, ellipsoid, echinate.

Fl. & Fr. : September—December.

Occasional, along the sides of the ravines in Ammathottam near Five falls.

2. MUKIA Arn.

Mukia maderaspatana (Linn.) M. J. Roem., Syn. Mon. 2 : 47. 1846. *Cucumis maderaspatana* Linn., Sp. Pl. 1012. 1753. *Mukia scabrella* (Linn. f.) Arn. in Hook., Lond. J. Bot. 3 : 276. 1841 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 623. 1879 (excl. syn.). *Melothria maderaspatana* (Linn.) Cogn. in DC., Mon. Phan. 3 : 623. 1881 & in Engl., Pflanzenr. 66 : 126. 1916 ; Gamble, Fl. Presid. Madras 1 (3) : 539. 1919 ; Chakraborty, Rec. Bot. Surv. India 17 (1) : 141. 1959. *Mosi-mosika* (Tamil).

Tendril climbers ; stems angular, grooved ; tendrils simple. Leaves variable, 2-4 × 1.5-4 cm, 3-5 lobed, acute at apex, cordate at base ; petioles 2-4 cm long, hairy. Flowers yellow, unisexual ; male flowers in axillary fascicles ; female flowers solitary, axillary. Fruits 0.5-1 cm in diameter, spherical, red when ripe.

Fl. & Fr. : July—November.

Rare, along the hedges in the outskirts of the forests at Five falls.

3. TRICHOSANTHES Linn.

Trichosanthes nervifolia Linn., Sp. Pl. 1008. 1753 ; Wt. et Arn., Prodr. 349. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 609. 1879 (*pro parte*) ; Gamble, Fl. Presid. Madras 1 (3) : 529. 1919 ; Chakraborty, Rec. Bot. Surv. India 17 (1) : 30. 1959.

Tendril climbers ; stem slender, glabrous, striated. Leaves 5-10 × 2.5-5.5 cm, cordate-sagitate, entire or slightly dentate, glabrous, shortly acuminate at apex, 3-nerved and cordate at base ; petioles 1.5-2.5 cm long. Flowers white, unisexual ; male flowers in axillary racemes, 2.5-6 cm long ; bracts minute, deciduous ; female flowers solitary. Fruits up to 9 cm long, ovoid, acute at both ends, scarlet when ripe.

Fl. & Fr. : October—December.

Rare, behind the forest Rest House.

4. ZEHNERIA Endl.

Zehneria maysorensis (Wt. et Arn.) Arn. in Hook., Lond. J. Bot. 3 : 275. 1841 ; Jeffery, Kew Bull. 15 : 366, 1962. *Bryonia maysorensis* Wt. et Arn., Prodr. 345. 1834 ; Wt., Ic. t. 758. 1841. *Melothria perpusilla* (Bl.) Cogn. var. *subtruncata* Cogn. in DC., Mon. Phan. 3 : 608. 1881 ; Gamble, Fl. Presid. Madras 1 (3) : 538. 1919 ; Chakraborty, Rec. Bot. Surv. India 17 (1) : 148. 1959. *M. perpusilla sensu* Chakraborty, Rec. Bot. Surv. India 17 (1) : 146. 1959 (*pro parte*). *Zehneria hookeriana sensu* Clarke in Hook. f., Fl. Brit. Ind. 2 : 624. 1879 (*pro parte*). *Melothria mucronata sensu* Chakraborty, Rec. Bot. Surv. India 17 (1) : 148. 1959 (*non* Cogn. 1881).

Slender climbing herbs ; branches glabrous or puberulous. Leaves up to 8×7.5 cm, broadly-ovate, undivided or 3-5 lobed, membranous, undulate-denticulate, glabrate or scabrous above, glabrous beneath, acuminate and mucronate at apex, truncate or emarginate at base. Flowers white, unisexual ; male and female flowers co-axillary, solitary, fascicled or in peduncled racemes. Fruits 0.8-1 cm long, ovoid or globose, glabrous.

Fl. & Fr. : May—November.

Occasional in the outskirts of the forests and also in the valleys below Shembagadevi falls.

35. CAPPARACEAE

1a. Leaves simple

2a. Plants climbing (lianas) ; calyx tubular below *Maerua* 4

2b. Plants not climbing (shrubs or trees) ; calyx divided to the base into sepals *Capparis* 2

1b. Leaves trifoliate

3a. Flowers solitary, axillary ; stamens numerous *Cadaba* 1

3b. Flower terminal, corymbose ; stamens 4-6 *Crataeva* 3

1. CADABA Forssk.

Cadaba trifoliata Wt. et Arn., Prodr. 24. 1834 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 172. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1(1) : 42. 1915.

Unarmed shrubs, 0.6-2 m high ; stem woody. Leaves trifoliate ; leaflets 5-9×2.5-3.5 cm, ovate or linear-oblong, entire, glabrous, acute or obtuse at apex, acute at base ; rhachis 3.5-5 cm long. Flowers yellowish-white, solitary, axillary, towards the apex of branches ; gynophore 2-2.5 cm long, filiform, glabrous. Berries 3-4.5 cm long, cylindric, long stalked.

Fl. & Fr. : February—May.

Rare in the dry outskirts of the reserve forests before Old Courtallum, along the sides of the dried stream below New falls and also above Chittaruvi on the way to Tekkumalai.

2. *CAPPARIS* Linn.

- 1a. Flowers solitary and axillary, in supra-axillary rows or in axillary racemes
 - 2a. Flowers solitary, axillary
 - 3a. Plants armed
 - 4a. Leaves narrow, linear ; flowers purplish-white *C. divaricata* 1
 - 4b. Leaves ovate or lanceate ; flowers pale pink or red *C. diversifolia* 2
 - 3b. Plants unarmed *C. rheedii* 6
 - 2b. Flowers in supra-axillary rows or in axillary racemes
 - 5a. Branchlets tomentose ; flowers in supra-axillary rows ; leaves elliptic-oblong ; berries obtusely 4-angled *C. zeylanica* 7
 - 5b. Branchlets brown puberulous ; flowers in axillary racemes ; leaves linear ; berries spindle-shaped (not angled) *C. fusifera* 3
- 1b. Flowers in terminal or subterminal umbels or corymbs
 - 6a. Midrib of the leaves sunken at least in the basal portion ; gynophore glabrous *C. parviflora* 5
 - 6b. Midrib of the leaves flattish or raised in the basal part ; gynophore hairy at base *C. grandis* 4

1. *Capparis divaricata* Lamk., Enc. Meth. Bot. 1 : 606. 1785 ; Wt. et Arn., Prodr. 77. 1834 Wt., Ic. t. 889. 1844-45 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 174. 1872 ; Jacobs, Blumea 12 : 71, f. 35. 1964. *C. stylosa* DC., Prodr. 1 : 246. 1824 ; (excl. var. *velutina*, which is *C. sepiaria*) ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 46. 1915. *Turattu* (Tamil).

Armed shrubs, 1-2 m high ; branchlets fulvous or whitish-tomentose, soon glabrescent. Leaves 2.5-5×0.5-1.2 cm, linear, widest near base, subcordate, obtuse at apex, acute or blunt at base ; midrib raised ; petioles 0.3-0.5 cm long. Flowers purplish-white or bluish-white, solitary,

axillary ; gynophore 1.5-2 cm long, glabrous. Fruits 2-4 cm in diameter, globose or subellipsoid, irregularly incrassate, red when ripe.

Fl. & Fr. : January—August.

Common in the dry deciduous areas between Main falls and Tiger falls.

Notes : On the authority of Brandis, Jacobs (*loc. cit.* p. 517) recorded the flower colour of the species as green or red in his revision of the genus for the Indo-Malayan region. But those plants at Courtallum possess purplish-white or bluish-white flowers.

2. *Capparis diversifolia* Wt. et Arn., Prodr. 27. 1834 ; Wt. in Hook., Ic. Pl. 2 : t. 181. 1837 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 175. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 45. 1915 ; Jacobs, Blumea 12 : 448. 1964.

Armed shrubs, 1-2 m high ; branches zigzag, glabrous when mature. Leaves $3-7 \times 0.5-3$ cm, ovate or lanceate, coriaceous, blunt, acute or acuminate at apex, acute or rounded at base ; nerves 5-7 pairs ; petioles 0.2-0.3 cm long. Flowers pale pink or red, large, solitary, axillary ; gynophore 0.8-1 cm long, glabrous. Fruits up to 3×2 cm, ellipsoid, apiculate.

Fl. & Fr. : January—September.

Fairly common around Main falls and in Tekkumalai.

3. *Capparis fusifera* Dunn, Kew Bull. 1914 : 377. 1914 & in Gamble Fl. Presid. Madras 1 (1) : 45. 1915 ; Jacobs, Blumea 12 : 454. 1964. *C. parviflora* Bedd., Ic. Pl. Ind. Or. 65, t. 276. 1874 (*non* Hook. f. et Thoms. 1872).

Armed, spreading shrubs, 3-4.5 m high ; branchlets brown, puberulous. Leaves $9.5-15.5 \times 3-6$ cm, linear, glabrous, long acuminate at apex, obtuse at base ; nerves 8-11 pairs ; petioles 0.4-1 cm long. Flowers whitish-yellow in small axillary pubescent racemes, 0.5-1 cm in length ; gynophore glabrous, 1-1.5 cm long. Berries $3.5-4.5 \times 1.5-2$ cm, spindle shaped.

Fl. & Fr. : March—June.

Very rare in Honey falls area in the evergreen forests. This endemic species deserves protection.

4. *Capparis grandis* Linn. f., Suppl. 263. 1781 ; Wt. et Arn., Prodr. 27. 1834 ; Wt., Ic. t. 21. 1838 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 176. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 46. 1915 ; Jacobs, Blumea 12 : 456. 1964. *C. bisperma* Roxb., Fl. Ind. 2 : 568. 1824 ; Wt. et Arn., loc. cit. p. 26. Nakkulinan, Turattu, Velaitturottu (Tamil).

Unarmed trees, 8-10 m high ; branches light yellow, pubescent. Leaves 2.5-5 x 1.5-4 cm, transversely elliptic, entire, olive green tomentose, acute, rounded or slightly apiculate at apex, narrowed at base ; petioles \pm 1 cm long, slender. Flowers white, light fragrant, in terminal densely pubescent corymbs ; gynophore 1.5-2 cm long, filiform, hairy at base. Berries 1-2 cm long, subglobose, smooth, purple.

Fl. & Fr. : May—July.

Rare, in Tekkumalai. When in full bloom, lot of insects are attracted.

5. *Capparis parviflora* Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 176. 1872 ; Bedd., Ic. Pl. Ind. Or. 276. 1874 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 46. 1915 ; Jacobs, Blumea 12 : 477. 1964.

Spreading, armed shrubs, 3-3.5 m high ; branches slender, fulvous-puberulous. Leaves 5-7.5 x 1.5-3.5 cm, ovate, subcoriaceous, acuminate at apex, blunt at base ; petioles 0.2-0.3 cm long. Flowers white, fragrant, in subterminal 3-5 flowered umbels ; gynophore 0.5-0.6 cm long, filiform, glabrous. Berries up to 1 cm in diameter, pisiform.

Fl. & Fr. : March—July.

Very rare in the humus soil along the ridges and sides of the stream below Honey falls.

6. *Capparis rheedii* DC., Prodr. 1 : 246. 1824 ; Dan H. Nicolson, Bull. Bot. Surv. India 17 (1-4) : 161. 1975 (1978). *C. heyneana* Wall. ex Wt. et Arn., Prodr. 25. 1834 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. India 1 : 174. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 45. 1915. *C. baduicca sensu auct. non* Linn. (1753) ; Jacobs, Blumea 12 : 435. 1965.

Unarmed shrubs, 1-2 m high ; stem slender, woody ; young parts brown or reddish tomentose, soon glabrescent. Leaves 7.5-13.5 x 2.5-4 cm, ovate, coriaceous, glabrous, brown-tinged when dry, bluntly acuminate at apex, acute at base ; midrib and main nerves flattish or slightly sunken ; petioles 0.5-1 cm long. Flowers white tinged with violet, soli-

tary, axillary ; gynophore 2-4 cm long, glabrous, shorter than the stamens. Berries ovoid, beaked.

Fl. & Fr. : March—May.

Very rare above Shembagadevi falls in the Shola forests. This endemic species deserves protection.

7. *Capparis zeylanica* Linn., Sp. Pl. (ed. 2) : 720. 1762 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 46. 1915 ; Jacobs, Blumea 12 : 505. 1965. *C. horrida* Linn. f., Suppl. 264. 1781 ; Wt., Ic. t. 173. 1839 ; Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 174. 1872. *C. pyrifolia non* Hook. f. et Thoms. Fl. Brit. Ind. 1 : 174. 1872 which is *C. brevispina*. *Adondai*, *Kattotti* (Tamil).

Armed shrubs, 3-4 m high ; branchlets tomentose. Leaves up to 10 × 5.5 cm, elliptic-oblong, subcoriaceous, glabrous, shiny above, acute or retuse at apex, narrowed at base ; nerves 3-8 pairs, reticulations distinct above ; petioles \pm 0.7 cm long. Flowers white, in supra-axillary rows. Berries 0.3-1 cm long, subglobose, obtusely 4-angled, reddish.

Fl. & Fr. : March—June.

Common along the outskirts of the forests between Tiger falls and Main falls.

3. CRATAEVA Linn.

Crataeva nurvala Buch. - Ham., Trans. Linn. Soc. Lond. 15 : 121. 1827 ; Wt. et Arn., Prodr. 23. 1934 ; Jacobs, Blumea 12 : 194. 1964. *C. religiosa* var. *nurvala* (Buch. Ham.) Hook. f. et Thoms. in Hook. f., Fl. Brit. Ind. 1 : 172. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 47. 1915. *Kili*, *Niravila*, *Varana* (Malayalam). *Maluram*, *Nirumalaiyam* (Tamil).

Unarmed trees, 4-8 m high ; young branches greenish brown when dried. Leaves trifoliate ; leaflets 7 — 17.5 × 2.5 — 7.5 cm, ovate-lanceate or obovate, chartaceous to thinly coriaceous, gradually acuminate towards apex, rounded or subacute at base ; midrib red tinged ; petiolules 0.3 — 0.6 cm long or rarely absent. Flowers white turning yellow in terminal corymbs. Berries 4-5.5 cm across, ellipsoid or globose, thick, crusty.

Fl. & Fr. : February - June.

Fairly common in the Chettiar palace campus and around Tiger falls.

4. *MAERUA* Forssk.

Maerua arenaria (DC.) Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 171. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 42. 1915. *Niebuhria arenaria* DC., Prodr. 1 : 244. 1823 ; Wt. *et* Arn., Prodr. 23. 1834. *Mulmurandai* (Tamil).

Unarmed lianas, 4 — 6 m high. Leaves 2.5 — 5 × 0.5 — 2.5 cm, broadly ovate to oblong, entire, glaucous, obtuse or shortly mucronate at apex, rounded or auricled at base ; petioles up to 0.6 cm long. Flowers yellowish in terminal corymbs ; gynophore 2 — 2.5 mm long, glabrous. Berries 5 — 13 cm long, twisted, knotted.

Fl. & Fr. : January — June.

Common in the outskirts of the forests around Tiger falls.

36. CLEOMACEAE

CLEOME Linn.

- | | |
|--|------------------------|
| 1a. Leaves simple ; flowers solitary, axillary | <i>C. monophylla</i> 1 |
| 1b. Leaves 3 — 5 foliate ; flowers in axillary racemes | <i>C. viscosa</i> 2 |

1. *Cleome monophylla* Linn., Sp. Pl. 672. 1753 ; Wt. *et* Arn., Prodr. 21. 1834 ; Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 170. 1872.

Erect, pubescent herbs, up to 90 cm high ; branches striate. Leaves simple, 5.5 — 10.5 × 1 — 3.5 cm, oblong lanceate, entire, acute at apex, obtuse or slightly cordate at base ; petioles up to 4 cm long, glandular pubescent. Flowers light violet, solitary, axillary ; bracts leafy. Capsules 6 — 9 × 0.2 — 0.3 cm, subcylindric, striated, with stout erect hairs, pointed ; seeds minute, transversely rugose.

Fr. & Fr. : February — August.

Common in Tekkumalai and around Main falls along the sides of rocks.

2. *Cleome viscosa* Linn., Sp. Pl. 672. 1753 ; Hook. f. *et* Thoms. in Hook. f., Fl. Brit. Ind. 1 : 170. 1872 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 41. 1915 ; Hugh H. Jltis, Brittonia 12 : 281. 1960. *C. icosandra* Linn., Sp. Pl. 672. 1753. *Polanisia viscosa* (Linn.) DC.,

Prodr. 1 : 242. 1824. *P. icosandra* (Linn.) Wt. et Arn., Prodr. 22. 1834 ; Wt., Ic. t. 2. 1838.

Erect, glandular hairy herbs, 40 - 90 cm high. Leaves 3 - 5 foliate ; leaflets up to 4.5×2.5 cm, elliptic - oblong or obovate, spathulate, entire, acute or rarely obtuse at apex, cuneate at base ; rhachis 1.5 - 3 cm long. Flowers yellow, with light small, in axillary racemes. Capsules 5 - 6.5 cm long, erect, obliquely striated, compressed, tapering at both ends, hairy ; seeds subglobose, finely transversely striated, black.

Fl. & Fr. : March - September.

A common weed in the waste places on the way to Five falls.

37. CRUCIFERAE

CARDAMINE Linn.

Cardamine hirsuta Linn., Sp. Pl. 655. 1753 ; Wt. et Arn., Prodr. 20. 1834 ; Hook. f. in Hook. f., Fl. Brit. Ind. 1 : 138. 1872 ; O.E. Schulz, Bot. Jahrb. 32 : 1903 ; Dunn in Gamble, Fl. Presid. Madras 1 (1) : 38. 1915.

Erect herbs, 10 - 25 cm high ; branches slender, glabrous. Leaves pinnately 5 or 7 foliate, 1 - 2.5 cm long ; leaflets orbicular ovate, toothed ; radical leaves petiolate ; upper leaves sessile. Flowers white in terminal racemes. Pods 1 - 2 cm long, narrow - linear, compressed, tapering at both ends.

Fl. & Fr. : November - March.

A rare semiaquatic weed along the banks of the stream below Shembagadevi.

38. SAPOTACEAE

MADHUCA Hamilton ex Gmel.

Madhuca longifolia (Koen. ex Linn.) Mac Bride, Contr. Gray Herb. Harv. n. s. 53 : 17. 1918 ; van Royen, Blumea 10 : 53. 1960. *Bassia longifolia* Koen. ex Linn., Mant. 2 : 563. 1771 ; Roxb., Fl. Ind. 2 : 523. 1832 ; Wt., Ill. Ind. Bot. t. 147. 1840 - 50 ; Hook. f. in Hook. f., Fl. Brit. Ind. 3 : 544. 1882 ; Gamble, Fl. Presid. Madras 2 (4) : 537. 1921. *Illipe malabrorum* Koen. ex Engl., Bot. Jahrb. 12 : 509. 1890 (incl. vars.).

Madhuca indica Gmel., Syst. 799. 1791 ; Sant., Bull. Bot. Surv. India 3 : 19. 1961. *M. latifolia* (Roxb.) Mac Bride, Contr. Gray Herb. Harv. n. s. 53 : 17. 1918. *Bassia latifolia* Roxb., Pl. Corom. 1 : 20. 1795 & in Fl. Ind. 2 : 526. 1832 ; Hook. f., *loc. cit.* p. 544 ; Gamble, *loc. cit.* p. 763. *Illipe latifolia* (Roxb.) Dubard, Rev. Gen. Bot. 20 : 195. 1908.

- 1a. Corolla lobes more than half the length of the entire corolla ; leaves obovate or oblong

var. *latifolia* 1

- 1b. Corolla lobes about the same length as the tube ; leaves linear-lanceolate

var. *longifolia* 2

1. ***Madhuca longifolia* var. *latifolia* (Roxb.) Cheval., Rev. Bot. Appl. 23 : 149. 1943 ; van Royen, Blumea 10 : 55. 1960. *M. latifolia* (Roxb.) Mac Bride, Contr. Gray Herb. Harv. n. s. 53 : 17. 1918. *Bassia latifolia* Roxb., Pl. Corom. 1 : 20. 1795 & in Fl. Ind. 2 : 526. 1832 ; Hook. f., *loc. cit.* p. 544 ; Gamble, *loc. cit.* p. 763. *Illipe latifolia* (Roxb.) Dubard, Rev. Gen. Bot. 29 : 185. 1908.**

Deciduous trees, 10-15 m high ; bark longitudinally fissured. Leaves 8-18 × 3-10.5 cm, elliptic-oblong or obovate, pubescent and reddish-brown when young, glabrous when mature, obtusely acuminate at apex, cuneate at base ; secondary nerves 9-12 pairs ; petioles 2-5 cm long. Flowers cream-coloured, fragrant, in 3-5 flowered axillary clusters. Berries 2-5 cm long, ovoid, reddish.

Fl. & Fr. : March-July.

Rare in the outskirts and rocky areas above the Courtallum Township.

2. ***Madhuca longifolia* var. *longifolia* ; van Royen, Blumea 10 : 53. 1960. *M. longifolia* (Koen.) Lam. Bull. Jard. Bot. Buitenz. 3, 7 : 182. 1925. *Bassia longifolia* Koen. et Linn., Mant. 2 : 565. 1771 ; Roxb., Fl. Ind. 2 : 523. 1832 ; Wt., Ill. Ind. Bot. t. 147. 1840-50 ; Hook. f. in Hook. f., Fl. Brit. Ind. 3 : 544. 1882 ; Gamble, Fl. Presid. Madras 2 (4) : 537. 1921. *Illipe malabrorum* Koen. ex Engl., Bot. Jahrb. 12 : 509. 1890 (incl. vars.). *Madhuca indica* Gmel., Syst. 799. 1791 ; Sant., Bull. Bot. Surv. India 3 : 19. 1961.**

Deciduous trees, 15-20 m high ; bark scaly. Leaves 7.5-12.5 × 2-3.5 cm, linear-lanceolate, reddish-brown when young, glabrous when mature, acute at apex, tapering at base ; secondary nerves 10-15 pairs ; petioles 1-1.5 cm long. Flowers white with a strong odour in axillary dense clusters. Berries 2-5 cm long, oblong, reddish.

Fl. & Fr. : March-July.

Rare in the old Travancore palace campus.

39. EBENACEAE

DIOSPYROS Linn.

Diospyros ebenum Koen. ex Retz., Lund. Physiogr. Salsk. Handl. 1 : 176. 1776 ; Wt. Ic. t. 188. 1839 ; Clarke in Hook. f., Fl. Brit. Ind. 3 : 558. 1879 ; Gamble, Fl. Presid. Madras 2 (5) : 775. 1923 ; Bakh., Bull. Jard. Bot. Buitenz. (ser. 3) 15 : 216. 1937 ; Howard et Norlindh, J. Arnold Arbor. 43 : 100. 1962. *D. assimilis* Bedd., Rep. For. Madras 1866 67 : 20, t. 1. 1867 & Ic. t. 28. 1871 ; Clarke, *loc. cit.* ; Gamble, *loc. cit.* *Karu, Mishatumpi, Vayasi* (Malayalam). *Acca, Calam* (Tamil).

Large trees, 30-35 m high. Leaves up to 12 × 4.5 cm, elliptic oblong, subcoriaceous, glabrous, bright green above, paler beneath, acuminate at apex, rounded at base. Female flowers greenish white, solitary, axillary. Berries 1.5-1.7 cm across, subglobose with the calyx forming a woody cup with recurved lobes beneath.

Fl. & Fr. : March - July.

Rare, along the sides of the ravines below Honey falls.

40. SYMPLOCACEAE

SYMPLOCOS Jacq.

- | | |
|---|-------------------------|
| 1a. Leaves closely serrate ; fruits 2.5 - 3 cm long, ellipsoid | <i>S. macrocarpa</i> 1 |
| 1b. Leaves distantly and shallowly serrate or entire ; fruits 0.8 - 1.3 cm long, ovoid - oblong | <i>S. macrophylla</i> 2 |

1. **Symplocos macrocarpa** Wt. ex Clarke in Hook. f., Fl. Brit. Ind. 5 : 582. 1882 ; Brand in Engl., Pflanzenr. 6 : 52. 1901 ; Gamble, Fl. Presid. Madras 2 (5) : 782. 1923 ; Noot., Revis. Symplocaceae 220. 1975. *Malaparala* (Malayalam). *Paralai* (Tamil).

Trees ; branchlets rusty pubescent. Leaves 7 — 13.5 × 2.5 — 5 cm, oblong, oblong-lanceate or oblanceate, thinly coriaceous, closely serrate, glabrous, obtuse, emarginate or long acuminate at apex, cuneate at base ; petioles 0.5-0.8 cm long. Flowers few in short rusty pubescent, axillary racemes. Drupes 2.5-3 cm long, ellipsoid, glabrous.

Fl. & Fr. : March.

Courtallum (Robert Wight 1697, CAL).

2. *Symplocos macrophylla* Wall. (Cat. no. 4431. 1831 *nom. nud.*) ex DC., Prodr. 8 : 257. 1844 ; Clarke in Hook. f., Fl. Brit. Ind. 3 : 578. 1882 ; Brand in Engl., Pflanzenr. 6 : 61. 1901 ; Noot., Revis. Symplocaceae 222. 1975. *S. rosea* Bedd., Trans. Linn. Soc. 25 : 219. 1866 ; Clarke, loc. cit. p. 583 ; Brand, loc. cit. p. 54 ; Gamble, Fl. Presid. Madras (5) : 2783. 1923.

Trees, 3.5–6 m high ; branchlets tawny villous. Leaves 14–17.5 × 4.5–6.5 cm, elliptic-oblong, distantly and shallowly serrate, glabrous, abruptly sharp-acuminate at apex, acute at base ; petioles 1.5–1.8 cm long. Flowers pink in axillary racemes, 2–2.5 cm long. Drupes 0.8–1.3 cm long, ovoid-oblong, crowned by acute calyx lobes.

Fl. & Fr. : December–March.

Common in the thickest below Vaithamalai and above Karupuswamy kovil, along the sides of deep ravines.

41. MYRSINACEAE

MAESA Forssk.

Maesa perrottetiana A. DC., Trans. Linn. Soc. Lond. 17 : 80. 1834 & in DC., Prodr. 8 : 80. 1844 ; Mez in Engl., Pflanzenr. 9 : 40. 1902 ; Gamble, Fl. Presid. Madras 2 (4) : 749. 1921. *M. indica* var. *perrottetiana* (A. DC.) Clarke in Hook. f., Fl. Brit. Ind. 3 : 509. 1882. *M. indica sensu* Wt., Ic. t 1208. 1848 (*non* DC. 1834). *Kirithi* (Malayalam). *Vamarai, Kirinti* (Tamil).

Feebly branched, glabrous shrubs, 1–2.5 m high ; leaves 4.5–9.5 × 2.5–5 cm, ovate-lanceate, thin, coarsely dentate, glabrous and shiny above, dull beneath, acuminate at apex, acute, or cuneate at base. Flowers white in axillary, slender paniculate racemes. Berries 0.3–0.5 cm in diameter, globose with persistent style.

Fl. & Fr. : May–March.

Fairly common in the lower altitudes of Tekkumalai along the hedges bordering the stream.

42. CRASSULACEAE

KALANCHOE Adans.

Kalanchoe pinnata (Lamk.) Pers., Syn. 446. 1805. *Cotyledon pinnata* Lamk., Dict. 2 : 141. 1786. *Bryophyllum calycinum* Salisb., Parad.

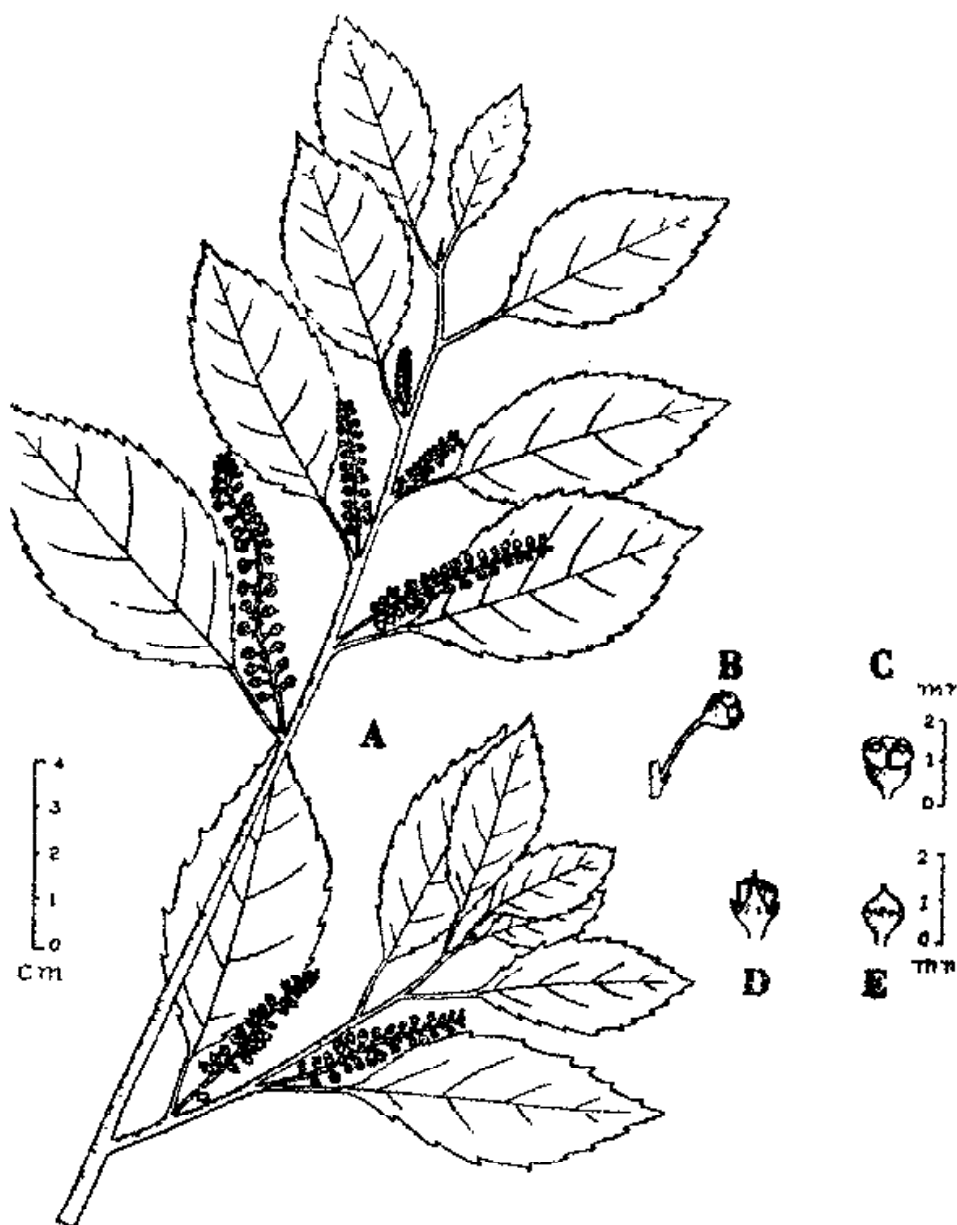


Fig. 3. *Mesua perrottetiana* A. DC.

A. Habit, B & C. Flowers
D. L.S. of Flower, E. Fruit.

Lond. t. 3. 1805 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 416. 1878. *B. pinnatum* (Lamk.) Kurz. ; Gamble, Fl. Presid. Madras 1 (3) : 451. 1919 ; Berger in Engl. & Prantl, Pflanzenfam. (ed. 2) 18a : 410. 1930. *Elamulachi*, *Pacha*, *Venalpacha* (Malayalam).

Robust herbs, 30–90 cm high, erect or ascending from a prostrate, woody base ; stems with prominent leaf scars. Leaves 6 — 15 × 3.5 — 7.5 cm, ovate or ovate lanceate, thick, fleshy, crenate bicrenate, obtuse at apex, acute or obtuse at base ; petioles 1–10 cm long. Flowers reddish purple in lax paniced cymes.

Fl. : March–July.

Succulent herbs in the shady areas of Tekkumalai and Chittaruvi, along the sides of rocks.

43. PAPILIONACEAE

- | | |
|--|----------------------|
| 1a. Stamens free | <i>Sophoreae</i> 7 |
| 1b. Stamens all united into a tube or sheath | |
| 2b. Fruits jointed, constricted between seeds and breaking transversely into lomentum (except in <i>Pycnospora</i>) | <i>Hedysarreae</i> 4 |
| 2b. Fruits not jointed | |
| 3a. Trees, shrubs or woody climbers | |
| 4a. Fruits indehiscent | <i>Dalbergieae</i> 1 |
| 4b. Fruits dehiscent | |
| 5a. Leaves pinnately compound ; anthers uniform | <i>Galegeae</i> 2 |
| 5b. Leaves digitately 3-foliate ; anthers dimorphic | <i>Genisteae</i> 3 |
| 3b. Herbs or undershrubs, erect, procumbent or climbing | |
| 6a. Leaves with a terminal leaflet | |
| 7a. Stipels absent | |
| 8a. Stamens monadelphous | <i>Genisteae</i> 3 |
| 8b. Stamens diadelphous (mostly 9+1) | <i>Galegeae</i> 2 |
| 7b. Stipels present (except in <i>Atylosia</i> & <i>Dunbaria</i>) | |
| 9a. Erect herbs ; leaves multifoliate, imparipinnate ; ovary not surrounded by a disc | <i>Galegeae</i> 2 |
| 9b. Procumbent or twining herbs or undershrubs ; leaves 3-foliate, pinnate ; ovary surrounded by a disc | <i>Phaseoleae</i> 5 |

- 6b. Leaves without a terminal leaflet,
the rachis produced into a bristle

Vicieae 6

1. Tribe *Dalbergieae*

1a. Trees

2a. Leaflets alternate

- 3a. Pods oblong or linear ; leaflets smaller, up to 5
cm long

Dalbergia 7

- 3b. Pods orbicular ; leaflets larger, more than 5 cm
long

Pterocarpus 20

2b. Leaflets opposite

Pongamia 18

1a. Climbing shrubs

Derris 8

2. Tribe *Galegeae*

1a. Erect herbs, undershrubs or shrubs

2a. Pods flattened, not turgid

Tephrosia 24

2b. Pods not flattened, turgid

Indigofera 14

1b. Large climbing shrubs

3a. Leaves 3-foliate ; pods glabrous

Pseudarthria 19

3b. Leaves 5-7 foliate ; pods velvety

Milletia 16

(The genus *Pseudarthria* is kept here based on the nature of fruit dehiscence, but it is commonly included in *Hedysareae*)

3. Tribe *Genisteae*

Leaves 1-3 foliate or rarely 5-7 foliate ; flowers usually yellow ; style abruptly incurved near base ; pods globose or oblong, often turgid, continuous within *Crotalaria* 6

4. Tribe *Hedysareae*

1a. Leaves exstipellate

2a. Stamens monadelphous ; leaves 2-4 foliate

3a. Leaves 4-foliate ; anthers uniform

Gelissaspis 13

3b. Leaves 2-3 foliate ; anthers dimorphic

4a. Leaflets 2

Zornia 25

4b. Leaflets 3

Stylosanthes 23

- 2b. Stamens diadelphous ; leaves many-foliolate *Aeschynomene* 2
- 1b. Leaves stipellate
 - 5a. Pods not distinctly jointed, continuous within *Pycnospora* 21
 - 5b. Pods with distinct joints, breaking up into lomentum
 - 6a. Bracts small, narrow *Desmodium* 9
 - 6b. Bracts large, orbicular *Phyllodium* 17

5. Tribe *Phaseoleae*

- 1a. Leaves gland-dotted beneath ; stipels absent
 - 2a. Pods depressed transversely or obliquely between the seeds outside ; seeds conspicuously strophilate *Atylosia* 3
 - 2b. Pods not depressed between seeds outside ; seeds not strophilate *Dunbaria* 11
- 1b. Leaves not gland-dotted beneath ; stipels present
 - 3a. Stamens monadelphous *Canavalia* 4
 - 3b. Stamens diadelphous
 - 4a. Styles not bearded below the stigma or along one side of the style *Galactia* 12
 - 4b. Styles bearded below the stigma or down along one side of the style
 - 5a. Flowers yellow, pink or purple ; bracts and bracteoles small, inconspicuous, caducous
 - 6a. Styles glabrous ; stigma surrounded by a ring of hairs *Dolichos* 10
 - 6b. Styles bearded down one side ; stigma without a ring of hairs *Labiab* 15
 - 5b. Flowers blue ; bracts and bracteoles large, conspicuous, more or less persistent *Clitoria* 5

6. Tribe - *Vicieae*

Slender woody twiners with pinnate leaves, the rhachis ending in a bristle ; stamens 9, connate, in a sheath ; seeds blood-red in colour with a black patch at one end
Abrus 2

7. Tribe *Sophoreae*

Shrubs ; leaves imparipinnate ; flowers racemose ; pods moniliform

Sophora 221. *ABRUS* Adans.

Abrus precatorius Linn., Syst. Nat. ed. 2 : 472. 1767 ; Wt. et Arn., Prodr. 236. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 175. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 349. 1918 ; Breteler, Blumea 10 : 618. 1960 ; Verdcourt, Kew Bull. 24 : 240. 1970. *Chenkunni*, *Kunni*, *Kakani*, *Madukam* (Malayalam). *Adingam*, *Atti*, *Cirrilai*, *Cingili* (Tamil).

Twining undershrubs, 2-4 m high ; young branches sparsely hairy. Leaves pinnate ; leaflets 10-20 pairs, 0.3 — 0.8 × 0.2 — 0.4 cm, ligulate-oblong, entire, glabrous above, slightly hairy beneath, rounded and minutely apiculate at apex, obtuse at base ; petiolules very short ; stipules absent. Flowers pink or bluish white in axillary racemes shorter than the leaves. Pods 2-3.5 cm long, beaked, slightly pubescent ; seeds globose, ± 0.3 cm in diameter, blood red with a black patch at one end.

Fl. & Fr. : October - May.

Common in the outskirts around Tiger falls and along the hedges on the way to Five falls.

2. *ABSCHYNOMENE* Linn.

Aeschynomene indica Linn., Sp. Pl. 713. 1753 ; Wt. et Arn., Prodr. 219. 1834 ; Wt., Ic. t. 405. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 151. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 331. 1918 ; Rudd, Reinwardtia 5 : 30. 1959. *Nellithali* (Malayalam). *Kottiram*, *Takai* (Tamil).

Much branched undershrubs, 0.5-1 m high. Leaves imparipinnate ; leaflets 0.3-0.4 cm long, linear-obtuse, glabrous ; rhachis 3.5-10 cm long, glandular ; stipules scarious. Flowers pale-yellow in 1-4 flowered axillary racemes ; bracts leafy. Pods 3-4.5 cm long, jointed, smooth on one margin, arched on the other.

Fl. & Fr. : August - January.

Semiaquatic, on the way to Five falls.

3. *ATYLOSIA* Wt. et Arn.

- 1a. Plants pubescent ; fruits more than 2.5 cm long, thinly white-hairy

A. albicans 1

- 1b. Plants hairy ; fruits less than 2.5 cm long, densely brown-hairy

A. scarabaeoides 2

1. *Atylosia albicans* (Wt. et Arn.) Benth., Pl. Jungh. 243. 1852 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 215. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 369. 1918. *Cantharospermum albicans* Wt. et Arn., Prodr. 256. 1834 (*pro parte*).

Large climbing shrubs ; branches striated, pubescent. Leaves trifoliate ; leaflets $1.5 - 4.2 \times 1.2 - 3.5$ cm, roundish, ovate or obovate, glabrous above, whitish pubescent beneath, rounded or acute and shortly mucronate at apex, ovate or cuneate at base. Flowers yellow, in few flowered lax racemes ; calyx teeth 4-5 times shorter than the corolla. Pods 2.5-3.5 cm long, oblong, thinly white hairy, often mucronate at apex ; depressions of the pods slightly oblique.

Fl. & Fr. : November - March.

Courtallum (P. F. Fyson 5046, PCM ; M. Rama Rao's Coll. 2074, CAL).

2. *Atylosia scarabaeoides* (Linn.) Benth., Pl. Jungh. 245. 1852 ; Baker in Hook f., Fl. Brit. Ind. 2 : 215. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 369. 1918. *Dolichos scarabaeoides* Linn., Sp. Pl. 726. 1753. *Cantharospermum pauciflorum* Wt. et Arn., Prodr. 225. 1834.

Slender twining herbs ; stem striated, golden villous. Leaves 3-foliate ; leaflets $1 - 2.5 \times 1 - 1.5$ cm, obovate or elliptic, hairy on both sides, rounded, obtuse or shallowly notched at apex, acute at base. Flowers yellow in 2-6 flowered axillary racemes. Pods 1-2.5 cm long, linear-elliptic, densely brown hairy, blunt or apiculate at apex.

Fl. & Fr. : November - April.

Rare, along the sides of rocks above Tiger falls.

4. *CANAVALIA* Adans. corr. DC. *nom. gen. cons.*

- 1a. Leaflets strongly or slightly acuminate ; pods 20-35 cm long ; hilum of the seeds 1.5-2 cm long

C. gladiata 1

- 1b. Leaflets abruptly narrowed to an obtuse tip ; pods 10-15 cm long ; hilum of the seeds up to 1 cm long

C. virosa 2

1. *Canavalia gladiata* (Jacq.) DC., Prodr. 2 : 404. 1825 ; Wt. et Arn., Prodr. 253. 1834 ; Wt., Ic. t. 753. 1838 ; Chatterjee, J. Indian Bot. Soc. 28 : 86. 1949 ; Sauer, Brittonia 16 : 149. 1964. *Dolichos gladiatus*, Jacq., Collet. 2 : 276. 1788. *Canavalia ensiformis* (Linn.) DC. var. *gladiata* (Jacq.) O. Ktze., Rev. Gen. Pl. 3 (2) : 55. 1898. *C. ensiformis sensu* Baker in Hook. f., Fl. Brit. Ind. 2 : 195. 1876 *et alior auct. (non, DC. nec. Dolichos ensiformis* Linn.) ; Gamble, Fl. Presid. Madras 1 (2) : 359. 1918. *Kanavala*, *Valamara*, *Kattuvalamarakaya* (Malayalam). *Koliyavari*, *Tambutti*, *Kattuthambattan* (Tamil).

Twining herbs, 3–4 m high ; branches glabrous. Leaves pinnately trifoliate ; leaflets 5–12.5 × 3.5–8.5 cm, ovate, acuminate at apex, rounded at base ; rhachis 8.5–13 cm long, glabrous. Flowers purple in axillary racemes, 10–20 cm long. Pods 15–30 × 2–3.5 cm, linear or oblong ; seeds ovoid, white.

Fl. & Fr. : September–March.

Common in the shrubby areas below Shembagadevi.

2. *Canavalia virosa* (Roxb.) Wt. et Arn., Prodr. 253. 1834 ; Gamble, Fl. Presid. Madras 1 (2) : 359. 1918 ; Chatterjee, J. Indian Bot. Soc. 28 : 93. 1949 ; Sauer, Brittonia 16 : 152. 1964. *Dolichos virosus* Roxb., Fl. Ind. 3 : 310. 1832. *C. ensiformis* (Linn.) DC. var. *virosa* (Roxb.) Baker in Hook. f., Fl. Brit. Ind. 2 : 196. 1876.

Climbing shrubs, 3–5 m high ; stem and branches glabrous or pubescent. Leaves 3-foliate ; leaflets 8–14 × 5–8.5 cm, ovate or orbicular, subacute, obtuse or rarely shortly mucronate at apex, cuneate or subtruncate at base ; rhachis 8–16 cm long. Flowers rose-purple in axillary racemes, up to 15 cm long. Pods 10–14 × 2–2.5 cm, elliptic-elongate, compressed, sparsely hairy or glabrous ; seeds ovoid or ellipsoid, amber with gamboge streaks.

Fl. & Fr. : October–April.

Rare in the interior areas of Old Courtallum, along the sides of rocks.

5. CLITORIA Linn.

Clitoria ternatea Linn., Sp. Pl. 753. 1753 ; Wt. et Arn., Prodr. 205. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 208. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 365. 1918. *Sankupushpam*, *Aral*, *Kakkanamkoti* (Malayalam). *Kakkanam*, *Kakkattam*, *Kakkanamkoti* (Tamil).

Twining herbs, 2–3 m high ; branches slender, pubescent. Leaves pinnate, 3–many foliate ; leaflets $2.5 - 5 \times 1.5 - 3.5$ cm, elliptic oblong, glabrous or sparsely hairy, obtuse at apex, acute or obtuse at base ; petiolules up to 2.5 cm long. Flowers blue, solitary or in racemose fascicles, axillary. Pods $5 - 10 \times 1 - 1.3$ cm, linear oblong, beaked, hairy ; seeds 6–10, subglobose.

Fl. & Fr. : August–December.

Rare on the way to Old Courtallum.

6. CROTALARIA Linn.

- 1a. Leaves 3-foliate *C. pallida* 5
- 1b. Leaves 1-foliate
 - 2a. Plants villous or densely hairy
 - 3a. Pods oblong or clavate-oblong ; flowers in terminal elongated racemes or rarely panicles
 - 4a. Pods oblong, broad at apex ; leaves narrowly-linear, less than 1 cm broad *C. mysorensis* 3
 - 4b. Pods clavate-oblong, apiculate at apex ; leaves oblanceate, more than 2.5 cm broad *C. subperfoliata* 6
 - 3b. Pods ovoid ; flowers in terminal or axillary umbels *C. nana* 4
 - 2b. Plants glabrous, suffruticose or silky-pubescent
 - 5a. Flowers yellow ; plants silky-pubescent ; leaves linear-lanceate *C. albida* 1
 - 5b. Flowers white or bluish-white ; plants glabrous or suffruticose ; leaves ovate, obovate or oblong
 - 6a. Pods villous when young, pubescent when ripe ; leaves acute at apex *C. verrucosa* 7
 - 6b. Pods glabrous throughout ; leaves emarginate at apex *C. linifolia* var. *tecta* 2

1. *Crotalaria albida* Heyne ex Roth, Nov. Sp. Pl. Ind. Or. 333. 1821 ; Wt. et Arn., Prodr. 189. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 71. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 295. 1918 ; de Munk, Reinwardtia 6 : 200. 1962.

Low herbs, 15–40 cm high, much branched from the base; branches silky pubescent. Leaves $\times 1.5 \times 0.4$ cm, linear oblong or oblanceolate, sessile, grey pubescent, apiculate at apex, cuneate at base. Flowers yellow in terminal racemes. Pods 1–2 cm long, oblong, cylindrical.

Fl. & Fr. : November - April.

Common in the waste places and rocky areas around Tiger falls.

2. *Crotalaria linifolia* Linn. f. var. *tecta* (Roth) K.K.N. Nair *stat. et comb. nov.* *C. tecta* Roth, Nov. Sp. Pl. Ind. Or. 334. 1821; Baker in Hook. f., Fl. Brit. Ind. 2 : 72. 1875; Gamble, Fl. Presid. Madras 1 (2) : 294. 1918.

Erect herbs, 30–40 cm high; branches rare, pubescent or suffrutescent. Leaves subsessile, $0.6 - 2.2 \times 0.5 - 1.2$ cm, obovate or oblong, glabrous above, appressed pubescent beneath, emarginate at apex, cuneate at base. Flowers brown when in bud, in terminal appressed pubescent racemes. Pods up to 1.5 cm long oblique, oblong, glabrous.

Fl. & Fr. : August - October.

A very rare plant along the sides of small canals below Tiger falls.

Notes : *C. linifolia* Linn. f. and *C. tecta* Roth are two distinct species described in Indian Floras. Younger Linnaeus described the former based on 'Konigs' collection from India (probably Peninsular India, as Koenig's collections were mostly from that area) and Roth (*loc. cit.*) also described the species *C. tecta* from Peninsular India based on Heyne's collections. Wight and Arnott (*loc. cit.* pp. 189–190) while describing the two species came across their close resemblances, but kept them distinct based on the shape of the leaves and the legumes which formed the basis of Baker's (*loc. cit.*) and Gamble's (*loc. cit.*) key characters for the segregation of the two taxa.

A critical evaluation of the characters of both the species in question led the authors to the conclusion that *C. tecta* can no longer stand as a distinct species; the only character which distinguishes the two taxa being the oblique-oblong pods in *C. tecta* and oblique-rounded or ovoid pods in *C. linifolia*. Hence the species *C. tecta* Roth is reduced to a variety under *C. linifolia* Linn. f.

In addition to the type specimen of the taxon the following materials from Peninsular India at Central National Herbarium were examined and is found to belong to this taxon. Kerala State, without specific

locality, *M. A. Lawson* 298 (CAL) ; Markara, 5-9-1913, *M. Rama Rai* 1636 (CAL) ; Markarai, 11.9.1913, *C. C. Calder* and *M. S. Ramaswami* 837 (CAL) ; Karnataka, Carnatic, *J. D. Hooker & Thomson s. n.* (CAL).

3. *Crotalaria mysorensis* Roth, Nov. Sp. Pl. Ind. Or. 338. 1821 ; *Wt. et Arn.*, Prodr. 182. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 70. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 295. 1918 ; de Munk, Reinwardtia 6 : 210. 1962.

Erect herbs, \pm 75 cm high ; branches densely hairy. Leaves subsessile, 2.5-7.5 \times 0.5-0.8 cm, narrowly-linear, densely hairy, acute at both ends. Flowers in terminal elongated racemes, drooping before flowering, erect afterwards. Pods up to 3 cm long, oblong, 1.3 cm broad at apex, glabrous with the long filiform style often persisting.

Fl. & Fr. : December.

Courtallum (*M. Rama Rao's Coll.* 2040, CAL).

Notes : The hairs on the plant body invariably become brown when dry and this character is quite diagnostic of the taxon.

4. *Crotalaria nana* Burm. f., Fl. Ind. 156, t. 48, f. 2. 1768 ; *Wt. et Arn.*, Prodr. 191. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 71. 1876 ; de Munk, Reinwardtia 6 : 210. 1962. *C. umbellata* *Wt.* (Cat. no. 700. 1833 *nom. nud.*) *ex Wt. et Arn.*, Prodr. 191. 1834 ; Gamble, Fl. Presid. Madras 1 (2) : 294. 1918.

Erect branched herbs ; branches with long, spreading hairs. Leaves subsessile, 1.8-3.5 \times 0.5-1 cm, oblong or oblanceate, silky-hairy on both surfaces, subacute and apiculate at apex, subcuneate at base. Flowers yellow in 6-8 flowered terminal or axillary umbels. Pods \pm 0.5 cm long, ovoid, glabrous.

Fl. & Fr. : August—December.

A common weed in the ground flora of Tekkumalai.

5. *Crotalaria pallida* Ait., Hort. Kew 3 : 20. 1789 ; Polhill, Kew Bull. 22 : 262. 1968. *C. striata* DC., Prodr. 2 : 131. 1825 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 84. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 301. 1918. *C. mucronata* Desv., J. Bot. 3 : 76. 1814 ; de Munk, Reinwardtia 6 : 209. 1962. *C. latifolia* Rxb. *ex Wt. et Arn.*, Prodr. 180. 1834.

Stout herbs or undershrubs, 1-1.5 m high ; branches puberulous. Leaves 3-foliate ; leaflets up to 5.5×1.5 cm, narrowly elliptic, membranous, glabrous above, minutely puberulous or glaucous beneath, obtuse, acute or mucronate at apex, narrowed at base. Flowers yellow striped with red, in terminal elongate, spicate racemes. Pods 2-3 cm long, cylindric-falcate, much deflexed, silky-pubescent when young, at length glabrate.

Fl. & Fr. : May—July.

A weed, common in the waste places.

6. *Crotalaria subperfoliata* Wt. (Wall. Cat. no. 5377. 1832 *nom. nud.*) *ex* Wt. *et* Arn., Prodr. 184. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 79. 1876 ; Gamble, Fl. Presid. Madras (1) 2 : 298. 1918.

Erect herbs up to 1 m high ; branches yellowish brown villous. Leaves up to 9.5×3.2 cm, oblanceate, villous on both sides, acute at apex, cuneate at base ; petioles 0.2-0.3 cm long, villous. Flowers yellow in axillary or terminal slender villous racemes, forming panicles. Pods clavate-oblong, long stalked, pubescent, apiculate at apex.

Fl. & Fr. : November—March.

Scarce, in the humus soil of Tekkumalai.

7. *Crotalaria verrucosa* Linn., Sp. Pl. 715. 1753 ; Wt. *et* Arn., Prodr. 187. 1834 ; Wt., Ic. t. 200. 1839 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 200. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 297. 1918.

Suberect herbs, up to 90 cm high ; stem angular, winged, green. Leaves up to 7.5×6 cm, ovate, subglabrous above, dawning or pale below, obtuse or acute at apex, tapering at base ; petioles up to 0.5 cm long. Flowers bluish-white in terminal or axillary long racemes. Pods 1.5-3.5 cm long, oblong-cylindric, villous when young, softly-pubescent when ripe, stalked.

Fl. & Fr. : November—April.

Rare, along the sides of gutters in Courtallum township and also around Swamiar falls in Udayathan estate.

7. DALBERGIA Linn. f. *nom. gen. cons.*

- | | |
|--|-------------------------|
| 1a. Armed, scandent shrubs | <i>D. horrida</i> 1 |
| 1b. Unarmed trees | |
| 2a. Stamens diadelphous (5+5) ; leaves oblong-elliptic | <i>D. lanceolaria</i> 2 |
| 2b. Stamens monadelphous (9 or 10) ; leaves obovate | <i>D. sissoides</i> 3 |

1. *Dalbergia horrida* (Dennst.) Mabberley, Taxon 25 : 538. 1977. *Dalbergia sympathetica* Nimmo ex Grah., Cat. Pl. Bomb. & Vicin. 55. 1839 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 234. 1876 ; Prain, J. Asiat. Soc. Bengal 66 : 446. 1897. *D. multiflora* Heyne (Wall. Cat. 5848 B. 1832 *nom. nud.*) ex Prain, J. Asiat. Soc. Bengal 70 : 59. 1901 & in Ann. R. Bot. Gard. Calcutta 10 (1) : 43. 1904 ; Gamble, Fl. Presid. Madras 1 (2) : 381. 1918.

Scandent shrubs ; stem with strong, blunt thorns, straight or variously curved ; young branches puberulous. Leaves imparipinnate ; leaflets 11-19, alternate, 1.2-2 × 0.5-1.5 cm, elliptic-oblong, subcoriaceous, pubescent on both surfaces, at length glabrate above, sparsely pubescent beneath, obtuse or retuse at apex, rounded at base. Flowers in short axillary panicles. Pods 4-7 cm long, oblong, shortly stalked, acute at apex.

Fl. & Fr. : November.

Courtallum (Collector? s. n., CAL).

Dalbergia horrida (Dennst.) Mabberly var. *glabrescens* (Prain) Thoth. et K. K.N. Nair, Taxon 30 : 46. 1981. *D. multiflora* Heyne ex Prain var. *glabrescens* Prain, J. As. Soc. Bengal 70 : 51. 1901 & in Ann. R. Bot. Gard. Calcutta 10 (1) : 44. 1904.

Leaves imparipinnate ; leaflets 11-15, 1-2 × 0.5-1 cm, elliptic, glabrous above, glabrous or glabrescent beneath, obtuse at apex, retuse or rounded at base. Inflorescence, flowers and fruits typical of the species proper.

Fl. & Fr. : November.

Courtallum (Robert Wight 250, 267. CAL).

An endemic variety, extinct from the area.

2. *Dalbergia lanceolaria* Linn. f., Suppl. 316. 1781 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 235. 1876 ; Prain, J. Asiat. Soc. Bengal 70 : 52. 1901 & in Ann. R. Bot. Gard. Calcutta 10 (1) : 93. 1904 ; Gamble, Fl. Presid. Madras 1 (2) : 383. 1918. *D. frondosa* Roxb. (Hort. Beng. 53. 1814 *nom. nud.*) ex DC., Prodr. 2 : 417. 1825 ; Roxb., Fl. Ind. 3 : 226. 1832 ; Wt. et Arn., Prodr. 266. 1834. *Pulari*, Mannaveetti (Malayalam). *Kalvellangu*, *Kattupacalai* (Tamil).

Deciduous trees, 5-10 m high ; bark smooth ; young branches hairy. Leaves imparipinnate ; leaflets 7-12, alternate, 1-4 × 1-2.5 cm, oblong, elliptic, glabrous on both sides, obtuse and often notched at apex, narrowed at base. Flowers bluish-white in axillary or terminal panicles. Pods 4-9 cm long, tapering at both ends, reticulately veined.

Fl. & Fr. : March—December.

Common along the outskirts of the forest at Old Courtallum and on the way to Tekkumalai.

3. *Dalbergia sissoides* Grah (Wall. Cat. no. 5876. 1832 *nom. nud.*) *ex* Wt. *et* Arn. Prodr. 265. 1834 ; Bedd., Fl. Sylvat. t. 24. 1869 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 231. 1876 ; Prain ; J. Asiat. Soc. Bengal 66 : 443. 1893 & in Ann. R. Bot. Gard. Calcutta 10 (1) : 81. 1904 ; Gamble, Fl. Presid. Madras 1 (2) : 383. 1918. *D. javanica* Miq., Fl. Ind. Bat. 1 : 132. 1855. *D. latifolia* Roxb. var. *sissoides* (Grah. *ex* Wt. *et* Arn.) Baker in Hook. f., Fl. Brit. Ind 2 : 231. 1876. *D. emarginata* Prain, J. Asiat. Soc. Bengal 70 : 41. 1901 (*non* Roxb.). *Itti*, *Veetti*, *Iruputu* (Malayalam). *Iruvadi*, *Todagattii* (Tamil).

Deciduous trees ; bark smooth, grey. Leaves imparipinnate ; leaflets 5-7, opposite, 2.5-5 × 1.5-3 cm, obovate, glabrous, acute at apex, cuneate at base. Flowers white with a light smell, in lax axillary panicles. Pods ± 1 cm across, samaroid, apiculate.

Fl. & Fr. : September—January.

Rather rare in the outskirts of the forests around Five falls.

8. *DERRIS* Lour. *nom. gen. cons.*

- 1a. Pods puberulous, narrow, thin, strap-shaped, 2-6 seeded ;
leaflets usually 9-13

D. scandens 2

- 1b. Pods silky-hairy, oval or oblong, 1-2 seeded ; leaflets
usually 5-7

D. benthamii 1

1. *Derris benthamii* (Thw.) Thw., Enum. Pl. Zeyl. 413. 1864 ; Gamble, Fl. Presid. Madras 1 (2) : 387. 1918 ; Thoth., Bull. Bot. Surv. India 3 : 186. 1962. *Brachypterum benthamii* Thw., Enum. Pl. Zeyl. 93. 1859. *Derris paniculata* Benth., J. Linn. Soc. Lond. 4 (suppl.) : 105. 1860 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 247. 1876.

Slender climbers ; stem glabrous. Leaves imparipinnate ; leaflets up to 4.4 × 2.3 cm, oblong, subcoriaceous, entire, glabrous, obtuse at apex, rounded at base ; petiolules ± 0.3 cm long. Flowers in copiously paniced inflorescence. Pods 3-3.2 cm long, oblong, brown-silky, faintly veined.

Fl. & Fr. : November.

Courtallum (M. Rama Rao 1984, CAL).

2. *Derris scandens* (Roxb.) Benth., J. Linn. Soc. Lond. 4 (suppl.) : 103. 1860 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 240. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 387. 1918 ; Thoth., Bull. Bot. Surv. India 3 : 187. 1961. *Dalbergia scandens* Roxb., Pl. Corom. 2 : 49, t. 192. 1805 ; Wt. et Arn., Prodr. 264. 1834 ; Wt., Ic. t. 275. 1840. *Derris timoriensis* (DC.) Pittier, Contr. U. S. Natn. Herb. 20 : 41. 1917 ; Thoth., Bull. Bot. Surv. India 12 : 105. 1970. *Deguelia timoriensis* (DC.) Taub. in Engl. & Prantl, Pflanzenfam. (ed. 1) 3 (2) : 345. 1891. *Muyalvalli*, *Nulalvalli* (Malayalam). *Annaikkattu*, *Punalikodi* (Tamil).

Climbing shrubs, 4-6 m high ; stem grey, dawny. Leaves imparipinnate, 8-18.5 cm long ; leaflets 4.5-6.5 × 2-3 cm, oblong or obovate, subcoriaceous, minutely puberulous below, retuse at apex, rounded or cuneate at base ; petiolules 0.2-0.3 cm long. Flowers white or pale rose coloured in simple axillary or rarely terminal racemes. Pods 8-12 × 1-1.6 cm, oblong, narrow, reticulately veined.

Fl. & Fr. : June--December.

Rare in the dry outskirts at Old Courtallum, especially around the reserve forest boundary stone no. 170.

9. *DESMODIUM* Desv. *nom. gen. cons.*

1a. Flowers leaf-opposed, solitary or 1-3 together

2a. Pedicels glabrous or with few hooked hairs towards the tip, 1-2.5 cm long

D. heterophyllum 1

2b. Pedicels all over or towards the tip with only straight hairs, 0.3-0.8 cm long

D. triflorum 3

1b. Flowers in terminal or axillary racemes

3a. Leaves 1-foliate ; pods densely hooked hairy

D. velutinum 4

3b. Leaves 3-foliate ; pods glabrous or puberulous

D. pyronii 2

1. *Desmodium heterophyllum* (Willd.) DC., Prodr. 2 : 334. 1825 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 173. 1876 (excl. syn.) ; Gamble, Fl. Presid. Madras 1 (2) : 347. 1918 ; van Meeuwen, Reinwardtia 6 : 251. 1962 ; Ohashi, Ginkgoana 1 : 239. 1973. *Hedysarum heterophyllum* Willd., Sp. Pl. 3 (2) : 1201. 1802. *Desmodium triflorum* var. *majus* Wt. et Arn., Prodr. 229. 1834 ; Wt., Ic. t. 291. 1839.

Spreading, prostrate herbs, 30-60 cm long ; branches slender, villous. Leaves 3-foliate ; leaflets 0.5-3.2 × 0.3-1.5 cm, ovate-oblong, entire, glab-

rous above, villous beneath, broadly ovate at apex, ovate at base ; rhachis up to 3 cm long. Flowers pink, solitary, leaf-opposed. Pods 1.5-2.3 cm long, villous, blunt at apex, 3-5 seeded.

Fl. & Fr. : June—December.

A weed, common in the plains, in moist areas.

2. *Desmodium pyronii* DC., Prodr. 2 : 234. 1825; Ohashi, Ginkgoana 1 : 190. 1973. *D. wightii* Garh. (Wall. Cat. no. 5718. 1831-32 *nom. nud.*) ex Wt. et Arn., Prodr. 266. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 169. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 346. 1918. *D. walkeri* Arn., Nova Act. Nat. Cur. 18 (1) : 331. 1836.

Diffuse herbs, 30-60 cm high ; branches slender, triquetrous, villous towards apex. Leaves 3-foliate ; leaflets 3.5-9.5 × 2.5-4.8 cm, oblong-lanceate, glabrous above, slightly pubescent beneath, acuminate at apex, obtuse at base ; rhachis up to 7.5 cm long. Flowers bluish-pink in terminal many-flowered villous racemes. Pods 6-8 jointed, puberulous.

Fl. & Fr. : November—March.

Fairly common in the humus soil of Tekkumalai.

3. *Desmodium triflorum* (Linn) DC., Prodr. 2 : 334. 1825 (excl. syn. cit. *Hedysarum biflorum quae est non Desmodiinae*) ; Wt. et Arn., Prodr. 229. 1834 (excl. var. *minus* et var. *villosum*) ; Wt. Ic. t. 292. 1839 (incl. var. *minus*) ; Baker in Hook. f. Fl. Brit. Ind. 2 : 173. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 347. 1918 ; van Meeuwen, Reinwardtia 6 : 261. 1962 ; Schubert, J. Arnold Arbor. 44 : 293. 1963 ; Ohashi, Ginkgoana 1 : 245, pl. 36b. 1973. *Hedysarum triflorum* Linn., Sp. Pl. 749. 1753 (*pro parte*, excl. vars.).

Small trailing herbs. Leaves 3-foliate ; leaflets 0.5-0.8 × 0.3-0.5 cm, obovate, membranous, glabrous above, pubescent beneath, truncate at apex, cuneate at base. Flowers bright purple, minute, axillary, 1-3 together. Pods up to 1 cm long, 3-5 jointed, puberulous, veined.

Fl. & Fr. : March—November.

A weed common in the plains, in wet, grassy localities.

4. *Desmodium velutinum* (Willd.) DC., Prodr. 2 : 328. 1825 ; van Meeuwen, Reinwardtia 6 : 264. 1962 ; Schubert, J. Arnold Arbor. 44 : 292. 1963 ; Ohashi, Ginkgoana 1 : 192. 1973. *Hedysarum velutinum* Willd., Sp. Pl. 3 (2) : 1174. 1802. *Desmodium latifolium* (Roxb. ex Ker) DC., Prodr. 2 : 328. 1825 ; Wt. et Arn., Prodr. 225. 1834 (incl. vars.

roxburghii, *telfairii* et *plekenetii* Wt. et Arn.); Baker in Hook. f., Fl. Brit. Ind. 2 : 328. 1876 (*pro syn.*); Gamble, Fl. Presid. Madras 1 (2) : 346. 1918.

Undershrubs, up to 2 m high ; branches terete, shortly fulvous-hairy. Leaves 1-foliate, 3.5-12 x 3-9.5 cm, ovate, hairy on both sides, margins slightly irregular, obtuse or subacute at apex, cordate or truncate at base ; petioles 1.5-3 cm long. Flowers rose-coloured, in terminal or axillary racemes. Pods up to 2 cm long, densely hooked-hairy.

Fl. & Fr. : July—February.

Very rare, in the rocky soil on the way to Tekkumalai.

10. *DOLICHOS* Lamk. *emend.* DC. (*pro parte, non Linn.*)

Dolichos trilobus Linn., Sp. Pl. 726. 1753 ; Verdcourt, Taxon 17 : 170. 1968 & in Kew Bull. 24 : 422. 1970. *D. falcatus* Klein ex Willd., Sp. Pl. 3 : 1047. 1803 ; Wt. et Arn., Prodr. 249. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 211. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 366. 1918 ; Mickle, Kew Bull. 5 : 353. 1951.

Slender twining herbs ; branches hirsute or rarely glabrous. Leaves 3-foliate ; leaflets 1.5-4 x 1.3-4 cm, broadly deltoid-ovate, hirsute or glabrous, acute at apex, mostly oblique at base ; terminal leaflet often 3-lobed ; stipules 0.4-0.8 cm long, triangular. Flowers rose-coloured in axillary, 2-8 flowered racemes. Pods 4-6.5 x 0.5-0.8 cm, linear, falcate, compressed.

Fl. & Fr. : November—March.

Rare in Tekkumalai above the second wooden bridge, along the sides of the stream.

11. *DUNBARIA* Wt. et Arn.

Dunbaria ferruginea Wt. et Arn., Prodr. 258. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 217. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 333. 1918. *D. latifolia* Wt. et Arn., Prodr. 258. 1834.

Climbing shrubs, 3-4 m high ; branches pubescent towards apex. Leaves 3-foliate ; terminal leaflet up to 8.5 x 6.5 cm, cordate-ovate, glabrous above, silky pubescent or villous beneath, acute at apex. Flowers yellow in racemes. Pods oblong, compressed, tawny pubescent.

Fl. & Fr. : August – January.

Fairly common in the dry outskirts of the forest between Main falls and Tiger falls.

Notes : When Wight and Arnott (*loc. cit.*) erected the species *D. ferruginea* and *D. latifolia*, they tried to distinguish the two taxa based on the difference in the size, shape and degree of pubescence of the leaves, the nature of calyx lobes and the number of seeds per pod. Later Baker (*loc. cit.*) merged the two taxa under *D. ferruginea*. Studies of the specimens of both the species at Central National Herbarium shows that even though Wight and Arnott described the leaves of *D. latifolia* as 'at length glabrous' it is not true always and the leaves are pubescent in varying degrees. The number of seeds per pod also varies from 2–5 and no correlation between the leaf characters and calyx nature is possible to segregate the two species. Hence Baker's (*loc. cit.*) concept of treating the two taxa as conspecific is accepted here.

12. GALACTIA P. Br.

Galactia tenuiflora (Klein ex Willd.) Wt. et Arn., Prodr. 206. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 192. 1876 (incl. vars.) ; Gamble, Fl. Presid. Madras 1 (2) : 356. 1918 ; Nootuboorn, Reinwardtia 5 : 431. 1961. *Glycine tenuiflora* Klein ex Willd., Sp. Pl. 3 : 1059. 1800. *Galactia villosa* Wt. et Arn., Prodr. 207. 1834 ; Gamble, *loc. cit.* p. 357. *G. tenuiflora* var. *villosa* Baker. in Hook. f., Fl. Brit. Ind. 2 : 192. 1876.

Slender, twining herbs : stem grey, villous. Leaves 3 foliate ; leaflets 2.5 – 9 × 1 – 3.5 cm, elliptic or oblong, softly pubescent or glabrous above, villous beneath, obtuse at apex, rounded at base ; rachis up to 9.5 cm long, villous. Flowers rose coloured, few in axillary racemes. Pods 2–3.5 cm long, densely villous.

Fl. & Fr. : September – February.

Fairly common climbers in the cleared areas of the reserve forest on the way to Tekkumalai.

13. GEISSASPIS Wt. et Arn.

Geissaspis cristata Wt. et Arn., Prodr. 218. 1834 ; Baker in Hook. f. Fl. Brit. Ind. 2 : 141. 1876 ; Taub. in Engl. & Prantl, Pflanzenfam. (ed. 1) 3 (3) : 82, t. 45B. 1891 ; Gamble, Fl. Presid. Madras 1 (2) : 324. 1918.

Trailing herbs, up to 30 cm long. Leaves abruptly pinnate, up to 0.7 cm long ; leaflets 4, 0.5 - 1.2 × 0.3 - 0.5 cm, obovate, glabrous, oblique or truncate at apex, narrowed at base ; petiolules obscure. Flowers purplish in axillary racemes ; bracts 0.6 - 1.5 cm long with hairs on the edges. Pods 1 or rarely 2 - jointed ; joint \pm 0.1 - 0.2 cm long, reticulated.

Fl. & Fr. : September - December.

Rare, in the open areas above Chittaruvu in the patches of soil between rocks.

14. INDIGOFERA Linn.

- 1a. Prostrate herbs, 30-40 cm long *I. linnaei* 2
- 1b. Erect shrubs or undershrubs, 40-60 cm high
 - 2a. Pods glabrous
 - 3a. Leaves 9-13 foliate ; branches appressed hairy *I. tinctoria* 4
 - 3b. Leaves 3-5 foliate ; branches glabrous *I. aspalathoides* 1
 - 2b. Pods appressed hairy *I. trita* subsp. *subulata* 3

1. *Indigofera aspalathoides* Vahl ex DC., Prodr. 2 : 231. 1825 ; Wt. et Arn., Prodr. 199. 1834 (excl. syn. *Aspalathus indicus* Linn.) ; Wt., Ic. t. 332. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 94. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 309. 1918 ; K.K.N. Nair, J. Ind. bot. Soc. 60 : 182. 1981. *Manali* (Malayalam). *Civanarvantu*, *Iraivanvenbu* (Tamil).

Erect undershrubs, 30 - 60 cm high ; branches slender, spreading. Leaves 3 - 5 foliate, crowded on young branches ; leaflets up to 2 × 0.5 cm, linear or oblanceolate, glabrous above, hairy beneath, apiculate at apex. Flowers red, solitary, axillary. Pods 1 - 1.6 cm long, cylindrical, pointed, straight, glabrous, red tinged.

Fl. & Fr. : March - September.

In the dry rockhill area above Tiger falls to Shembagadevi and also in the waste places on the way to Five falls the plant is common.

2. *Indigofera linnaei* Ali, Bot. Notiser 111 : 549. 1958 ; N.C. Nair et T.T. Koshy, J. Bombay Nat. Hist. Soc. 60 : 330. 1963. *I. enneaphylla* Linn., Mant. 2 : 272. 1771. append. 571. 1771 (*nom. illeg.*) ; Wt. et Arn., Prodr. 199. 1834 ; Wt., Ic. t. 403. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 94. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 309. 1918.

Prostrate herbs, 30–40 cm long ; branches terete, clothed with white appressed hairs. Leaves 7–9 or more foliate ; leaflets $0.5-0.8 \times 0.2-0.4$ cm, obovate-oblong, hairy, mucronate at apex, tapering at base. Flowers pink in racemes. Pods $\pm 0.5 \times 0.2$ cm, oblong hispid.

Fl. & Fr. : July–December.

Abundant in the red soil along the waysides to Five falls.

3. *Indigofera tinctoria* Linn., Sp. Pl. 751. 1753 ; Wt. et Arn., Prodr. 202. 1834 ; Wt., Ic. t. 365. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 99. 1876 ; Ali, Bot. Notiser 111 : 567. 1958 ; Verdcourt, Kew Bull. 24. 499. 1970. *I. sumatrana* Gaertn., Fruct. 2 : 317, t. 148, f. 4. 1791 ; Gamble, Fl. Presid. Madras 1 (2) : 312. 1918. *Nilam, Nili, Ranjani, Amari* (Malayalam). *Madhuparnika* (Tamil).

Erect shrubs, 1–1.5 m high ; branches terete or obtusely angular, appressed hairy. Leaves 9–13 foliate ; leaflets $1-2.5 \times 0.5-1$ cm, oblong or oblanceate, glabrous above, appressed hairy beneath, rounded and apiculate at apex, acute at base. Flowers pink in lax spicate racemes. Pods 1–3 cm long, linear, glabrous, apiculate.

Fl. & Fr. : June–December.

Very rare above Chittaruvi and on the way to Tekkumalai in the open areas.

4. *Indigofera trita* Linn. f., subsp. *subulata* (Vahl ex Poir.) Ali, Bot. Notiser 111 : 558. 1958. *I. subulata* Vahl ex Poir. in Lamk., Enc. Meth. Bot. (suppl.) 3 : 150. 1813 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 97. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 310. 1918. *Canbancum, Kandarum* (Tamil).

Stout undershrubs, up to 60 cm high ; branches appressed pubescent. Leaves 3 foliate ; leaflets $1.7-2.3 \times 0.5-1.5$ cm, elliptic or obovate, slightly emarginate at apex, acute at base. Flowers reddish in long racemes. Pods 4–5 cm long, linear, appressed hairy, drooping and curved upwards.

Fl. & Fr. : August–December.

Common near ponds in the outskirts of the forest before Five falls.

15. *LABLAB* Adans.

Lablab purpureus (Linn.) Sweet, Hort. Brit. ed. 1 : 481. 1827 ; Verd-court, Kew Bull. 24 : 410. 1970. *Dolichos purpureus* Linn., Sp. Pl. ed. 2 : 1021. 1763. *D. lablab* Linn., Sp. Pl. 725. 1753 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 209. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 367. 1918. *Lablab vulgaris* Savi, Nuov. Giorn. Lett. (Pisa) 8 : 116, f. 8, a - c. 1834 ; Wt. et Arn., Prodr. 250. 1834.

Twining herbs ; branches glabrous or hirsute. Leaves 3 foliate ; leaflets $2.5 - 11.5 \times 1.5 - 9.5$ cm, broadly ovate, glabrous, acute or acuminate at apex, rounded or oblique at base ; stipules triangular, 0.7 - 1 cm long, pubescent. Flowers white or purple in axillary racemes. Legumes $4 - 5 \times 1.5 - 2$ cm, flat, smooth, beaked.

Fl. & Fr. : November - March.

An escape from cultivation, common in the plains.

16. *MILLETTIA* Wt. et Arn.

Millettia rubiginosa Wt. et Arn., Prodr. 263. 1834 ; Wt., Ic. t. 207. 1839 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 104. 1876 ; Dunn, J. Linn. Soc. Lond. 41 : 146. 1912 ; Gamble, Fl. Presid. Madras 1 (2) : 322. 1918.

Large climbing shrubs ; branchlets ferruginous pubescent. Leaves imparipinnate ; leaflets $5 - 7, 11 - 15.5 \times 3 - 6.5$ cm, oblanceate or obovate, subcoriaceous, glabrous above, ferruginous pubescent beneath especially when young, shortly acuminate at apex, obtuse or cuneate at base. Flowers large, showy, fascicled in axillary and terminal, ferruginous pubescent racemes. Pods $3 - 9.5$ cm long, oblong or linear-lanceate, velvety.

Fl. & Fr. : August - November.

Courtallum (Robert Wight 912, CAL).

Notes : The species is highly endemic. The type locality of it is Courtallum. The only collection of the species other than the type specimen cited above at Central National Herbarium is Meebold 13078 from Vandanmettu in Kerala State. The species deserves protection.

17. PHYLLODIUM Desv.

Phyllodium pulchellum (Linn.) Desv., J. de Bot. ser. 2, 1 : 124, t. 5, f. 24. 1813 ; Ohashi, Ginkgoana 1 : 277. 1973. *Hedysarum pulchellum* Linn., Sp. Pl. 747. 1753. *Dicrema pulchellum* (Linn.) DC., Ann. Sci. Nat. 4 : 236. 1825 & in Prodr. 2 : 339. 1825 ; Wt. et Arn., Prodr. 230. 1834 ; Wt., Ic. t. 418. 1839. *Desmodium pulchellum* (Linn.) Benth., Fl. Hongk. 83. 1861 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 162. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 344. 1918 ; van Meeuwen, Reinwardtia 6 : 256. 1962.

Erect undershrubs, 1-2 m high ; young branches soft hairy. Leaves 3-foliolate, the terminal one large and the basal two small ; terminal leaflet 3-8.5 × 2.5-4 cm, elliptic-oblong, entire and wavy, sparsely hairy above, pubescent beneath, subacute or obtuse at apex, rounded or subacute at base ; rachis 2-3.5 cm long, pubescent. Flowers light yellow, fasciculate ; bracts persistent, foliaceous. Pods 2-jointed, glabrous on the sides, villous along the sutures.

Fl. & Fr. : February-March.

A common undergrowth in the Teak plantations and forest outskirts on the way to Five falls.

18. PONGAMIA Vent. *nom. gen. cons.*

Pongamia pinnata (Linn.) Pierre, Fl. Cochinch. sub. t. 385. 1899 ; Thoth., Bull. Bot. Surv. India 3 : 418. 1961. *Cytisus pinnatus* Linn., Sp. Pl. 741. 1753. *Pongamia glabra* Vent., Jard. Malm. 28. 1803 ; Wt. et Arn., Prodr. 262. 1834 ; Wt., Ic. t. 59. 1838 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 240. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 385. 1918. *Minnari*, *Punni*, *Unnu* (Malayalam). *Kaucanum*, *Kolliyam* (Tamil).

Trees 8-10 m high ; branches spreading, glabrous. Leaves imparipinnate ; leaflets 5.5-12 × 3.5-7.5 cm, variable, often ovate-oblong, glabrous, acute at apex, rounded or acute at base ; petiolules short. Flowers white, light-fragrant in axillary pendulous racemes. Pods 3.5-5 cm long, oblong, compressed, curved at apex, 1-seeded.

Fl. & Fr. : December-June.

Common around Main falls, below Shembagadevi, around Tiger falls and above Five falls.

Notes : A recent reference to this species and the genus to which it belongs is that of Bennett (J. Bombay Nat. Hist. Soc. 68 : 302-303, 1971). He reduced the genus *Pongamia* to a section '*Pongam*' under *Derris* Lour. The only species *P. glabra* Pierre was consequently transferred to *Derris* with the name *Derris indica* based on *Galedupa indica* Lamk. Bennett's reasoning in treating the two genera as congeneric is that the thick wingless pods of *Pongamia* is also observed in *Derris malaccensis* Prain. But this can not be a sound and reasonable view, as pods of *Pongamia* plants always remain rigid and wingless on the sutures and in habit the species is a medium sized tree. On the contrary, most of the species of *Derris* are scandent shrubs or true climbers and the pods are either distinctly or narrowly winged either on both the sutures or at least on the ventral suture.

19. PSEUDARTHRIA Wt. et Arn.

Pseudarthria viscida (Linn.) Wt. et Arn., Prodr. 209. 1834 : Wt., Ic. t. 286. 1838 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 154. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 334. 1918 ; Steenis, Reinwardtia 6 : 105. 1961. *Hedysarum viscidum* Linn., Sp. Pl. 747. 1753.

Prostrate or climbing herbs, 30-90 cm long ; branches soft hairy. Leaves pinnately trifoliate ; leaflets 4-7.5 × 3.5-5 cm, rhomboid-ovate or oblique-ovate, pubescent above, densely grey-silky beneath, acute at apex. Flowers greenish or pink in pairs or fascicled along the rhachis in terminal or axillary racemes or rarely panicles. Pods 1.5-2 cm long, linear-oblong, flat.

Fl. & Fr. : December-April.

Common in the disturbed areas along the road-sides to Agricultural estate from Five falls, on the way to Tekkumalai and behind the forest Rest House.

20. PTEROCARPUS Jacq. nom. gen. cons.

Pterocarpus marsupium Roxb., Pl. Corom. 5 : 2, 9, t. 116. 1798 ; Wt. et Arn., Prodr. 266. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 239. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 385. 1918. *Karinthakara*, *Malanthakara*, *Venga* (Malayalam). *Caruvakadagam Piracaram* (Tamil).

Deciduous trees, 5-9 m high ; bark thick, fissured. Leaves imparipinnate ; leaflets 5-7, 5.5-10 × 3.5-5 cm, elliptic-oblong, coriaceous, glabrous, obtuse or emarginate at apex, subacute at base ;

petiolules ± 0.5 cm long. Flowers pale yellow with a light smell in axillary or terminal panicles. Pods 2.5 - 4.5 cm across, orbicular, winged.

Fl. & Fr. : January - July.

A timber tree common along the slopes of hills and sides of ravines on the way to Old Courtallum and along the outskirts of the forests on the way to Five falls.

21. PYCNOSPORA R. Br. ex Wt. et Arn.

Pycnospora lutescens (Poir.) Schindl., J. Bot. 65 : 145. 1926 ; van Meeuwen, Reinwardtia 5 : 437. 1961. *Hedysarum lutescens* Poir. in Lamk., Enc. Meth. Bot. 6 : 417. 1806. *Flemingia monosperma* Moon., Cat. Ceyl. 54. 1854 sec. Wt. et Arn. *Pycnospora nervosa* Wt. et Arn., Prodr. 197. 1834. *P. hedysaroides* R. Br. ex Wt. et Arn., Prodr. 197. 1834 (*nomen*) ; Baker in Hook. f., Fl. Brit. Ind. 2 : 153. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 333. 1918.

Prostrate herbs ; branches slender, often trailing from an woody base, somewhat pubescent when young. Leaves pinnately trifoliate ; leaflets $0.5 - 1.2 \times 0.3 - 1.2$ cm, obovate or suborbicular, subcoriaceous, glabrous above, finely pubescent and prominently nerved beneath, rounded or slightly emarginate at apex, obtuse at base. Flowers bluishpink, small in slender terminal and axillary racemes. Pods $0.8 - 1 \times 0.4 - 0.5$ cm, oblong, inflated, apiculate.

Fl. & Fr. : May - June.

Rare, in the rocky or humus soil in the exposed areas of Tekkumalai.

22. SOPHORA Linn.

Sophora interrupta Bedd., Ic. Pl. Ind. Or. t. 165. 1869 & in Fl. Sylvat. 90. 1872 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 251. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 389. 1918.

Shrubs, 3 - 4 m high ; branches pubescent or glabrous. Leaves imparipinnate ; leaflets subopposite, $2.5 - 3 \times 1.2 - 1.8$ cm, elliptic, glabrous with prominent secondary veins above, obtuse or emarginate at apex, acute or obtuse at base ; petiolules ± 0.1 cm long. Flowers yellow in terminal racemes. Pods 6 - 10 cm long, moniliform, indehiscent.

Fl. & Fr. : July February.

Common in the dry, rocky areas between Tiger falls and Shemba-gadevi in the open forest floor.

23. *STYLOSANTHES* Sw.

Stylosanthes fruticosa (Retz.) Alston in Trimen, Handb. Fl. Ceylon 6 (suppl.) : 77. 1931 ; Mohlenbrock, Ann. Mo. Bot. Gard 44 : 318. 1957 ; Steenis *et al*, Reinwardtia 5 : 449. 1961 ; Verdcourt, Kew Bull. 24 : 59. 1970. *Arachis fruticosa* Retz., Obs. Bot. 5 : 26. 1791. *Stylosanthes mucronata* Willd., Sp. Pl. 3 : 1166. 1800 ; Wt. *et* Arn., Prodr. 218. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 149. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 326. 1918.

Much branched undershrubs ; branches stiff, wiry, more or less hairy when young. Leaves 3 foliate ; leaflets $0.5 - 1 \times 0.3 - 0.5$ cm, elliptic oblong, glabrous above, silky pubescent beneath, acute or mucronate at apex, subacute at base ; stipules large, adnate to the base of the petiole, toothed at the apex. Flowers yellow in terminal heads. Pods short, compressed, hooked at apex.

Fl. & Fr. : August January.

Common in the exposed, dry, rocky areas above Tiger falls.

Notes : Mohlenbrock (*loc. cit.*) considered *Stylosanthes aprica* Span. as a synonym of *S. fruticosa*, whereas van Steenis and others (*loc. cit.* p. 450) gave it as a synonym of *Stylosanthes sundaica* Taub. The problem requires further attention.

24. *TEPHROSIA* Pers. *nom. gen. cons.*

- | | |
|---|------------------------|
| 1a. Procumbent herbs | <i>T. pumila</i> 3 |
| 1b. Erect herbs or shrubs | |
| 2a. Plants almost glabrous or sparsely pilose | |
| 3a. Flowers in axillary racemes ; pods long-pointed | <i>T. maxima</i> 2 |
| 3b. Flowers in extra-axillary racemes ; pods obtuse with a short mucro | <i>T. purpurea</i> 4 |
| 2b. Plants silky-pubescent or villous | |
| 4a. Pods deflexed and falcately curved upwards ; plants silky-pubescent | <i>T. villosa</i> 5 |
| 4b. Pods nearly straight, drooping, not curved upwards ; plants villous | <i>T. hookeriana</i> 1 |

1. *Tephrosia hookeriana* Wt. et Arn. Prodr. 212. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 113. 1876 (*nomen*, excl. descrip. et syns) ; Gamble, Fl. Presid. Madras 1 (2) : 320. 1918.

Erect, diffuse shrubs ; branches villous. Leaves imparipinnate ; leaflets 5-7 pairs, 0.6-1.5 × 0.3-1 cm, oval to oblong-obovate, softly pubescent above, silvery hairy beneath ; petiolules 0.1-0.2 cm long. Flowers terminal, fascicled on many flowered racemes. Pods linear, nearly straight, pubescent.

Fl. & Fr. : November-December.

Courtallum (M. Rama Rao 1868, CAL).

2. *Tephrosia maxima* (Linn.) Pers., Syn. 2 : 329. 1807 ; Wt. et Arn., Prodr. 213. 1834 ; Gamble, Fl. Presid. Madras 1 (2) : 319. 1918. *Galega maxima* Linn., Sp. Pl. 1063. 1753. *Tephrosia purpurea* (Linn.) Pers. var. *maxima* (Linn.) Baker in Hook. f., Fl. Brit. Ind. 2 : 113. 1876.

Undershrubs, 30-45 cm high ; branches subglabrous or sprigled with spreading hairs. Leaves imparipinnate ; leaflets 6-8 pairs, up to 3 × 0.8 cm, obovate-cuneate, glabrous above, thinly pubescent beneath, obtuse, and shortly mucronate or not at apex, cuneate at base ; petiolules ± 0.1 cm long. Flowers yellow in axillary, few flowered racemes. Pods 2.5-5 cm long, flat, linear, long-pointed.

Fl. & Fr. : May-August.

Common in the open rocky areas of the plains.

3. *Tephrosia pumila* (Lamk.) Pers., Syn. 2 : 330. 1807 ; Shah, J. Bombay Nat. Hist. Soc. 60 : 296. 1963 ; Hepper, Kew Bull. 26 : 566. 1971. *Galega pumila* Lamk., Enc. Meth. Bot. 2 : 599. 1788. *Tephrosia purpurea* (Linn.) Pers. var. *pumila* Baker in Hook. f., Fl. Brit. Ind. 2 : 113. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 320. 1918. *T. procumbens* Buch.-Ham., Trans. Linn. Soc. Lond. 13 : 54. 1822.

Procumbent herbs ; branches slender, villous. Leaves imparipinnate ; leaflets 5-10 pairs, 0.6-1.8 × 0.4-0.6 cm, oblong, appressed hairy on both sides, retuse at apex, cuneate at base. Flowers in leaf-opposed villous racemes. Pods 3-3.5 cm long, gradually broadening towards apex, compressed, hairy.

Fl. & Fr. : May-December.

Courtallum (M. Rama Rao 2057, CAL).

4. *Tephrosia purpurea* (Linn.) Pers., Syn. 2 : 329. 1807 ; Wt. et Arn., Prodr. 213. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 112. 1876 ; Gamble, Fl. Presid. Madras 1 (2) : 320. 1918. *Cracca purpurea* Linn., Sp. Pl. 752. 1753.

Robust herbs or undershrubs, 30–60 cm high ; branches spreading, glabrous or sparsely pilose. Leaves imparipinnate ; leaflets 5–11 pairs, 1.5–2.4 × 0.4–0.8 cm, obovate or oblanceate, glabrous above, silky pubescent beneath, mucronate at apex, cuneate at base. Flowers bluish purple or white in terminal extra-axillary racemes. Pods 3.5–5 cm long, linear, slightly curved, mucronate at apex.

Fl. & Fr. : February–June.

Very common in the dry rocky plains, especially around Tiger falls.

5. *Tephrosia villosa* (Linn.) Pers., Syn. 2 : 329. 1807 ; Wt. et Arn., Prodr. 212. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 113. 1876 (excl. some syns.) ; Gillet, Kew Bull. 1958 : 121. 1958. *Cracca villosa* Linn., Sp. Pl. 752. 1753. *Tephrosia hirta* Buch. Ham., Trans. Linn. Soc. Lond. 13 : 546. 1822 ; Gamble, Fl. Presid. Madras 1 (2) : 318. 1918.

Erect, diffuse shrubs ; branches silky pubescent. Leaves imparipinnate ; leaflets 6–8 pairs, up to 1.5 × 0.3 cm, oblong, entire, glabrous above, sprinkled with white hairs beneath, obtuse or retuse at apex, cuneate at base ; petioles ± 0.1 cm long. Flowers in terminal villous racemes. Pods up to 2.5 cm long, falcately incurved upwards, villous.

Fl. & Fr. : June.

Courtallum (C.A. Barber 3288, CAL).

25. ZORNIA Gmel.

Zornia diphylla (Linn.) Pers., Syn. 2 : 318. 1807 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 146. 1876 ; Mohlenbrock, Webbia 16 (1) : 67, f. 44, 49. 1961 ; Steenis et al., Reinwardtia 5 : 453. 1961 (*pro parte*). *Hedysarum diphyllum* Linn., Sp. Pl. 747. 1753.

Prostrate herbs, 30–40 cm long ; branches glabrous or pubescent. Leaves 2-foliate ; leaflets equal in size, 1–2.8 × 0.5–1.5 cm, lanceate-ovate, glabrous, gland-dotted, acuminate at apex, acute at base ; petioles longer than the leaflets. Flowers yellow in spikes. Pods 1–6 jointed, bristled.

Fl. & Fr. : September - December.

Rather rare, among grasses in the rocky soil on the way to Tekkumalai.

44. CAESALPINIACEAE

- 1a. Leaves of 2 leaflets, jointed together with a deeply emarginate apex *Bauhinia* 1
- 1b. Leaves not as above (pinnately compound)
 - 2a. Leaves 1-pinnate; flowers in axillary racemes or terminal panicles *Cassia* 2
 - 2b. Leaves 2-pinnate; flowers in terminal corymbs *Delonix* 3

1. BAUHINIA Linn.

Bauhinia racemosa Lamk., Enc. Meth. Bot. 1 : 390. 1785 ; Wt. et Arn., Prodr. 295 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 276. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 406. 1919 ; de Wit, Reinwardtia 3 : 409. 1956. *Kotapuli, Mandarum* (Malayalam). *Arai, Atti, Arikka* (Tamil).

Trees 3 - 4 m high ; branches often drooping. Leaves 2 - 5 × 2 - 6.5 cm, bilobed, entire, glabrous, more or less tomentose beneath, deeply emarginate at apex, cordate at base ; petioles 1.5 - 2 cm long, pubescent. Flowers pale yellow, greenish in bud, in terminal racemes. Pods 15 - 25 × 1.5 - 2.5 cm, falcate, blunt at apex, tapering at base, turgid ; seeds 0.5 - 1 cm long, oblong, compressed.

Fl. & Fr. : June - October.

Rare, in the dry deciduous areas around Tiger falls and Old Courtallum falls.

2. CASSIA Linn.

- 1a. Stamens all fertile and antheriferous
 - 2a. Stamens markedly dissimilar in the length of the filaments, size and form of the anthers ; anthers of the outer whorl opening by longitudinal slits and those of inner whorl by sub-basal pores *C. fistula* 4
 - 2b. Stamens similar or dissimilar in size only ; anthers all opening by two sub-apical chinks which continue downwards as lateral sutures

- 3a. Leaflets 2 pairs only in a leaf; stamens 5, equal or subequal *C. absus* 1
- 3b. Leaflets 25-50 pairs in a leaf; stamens 10, alternately and rarely the anterior long and short *C. mimosoides* 6
- 1b. Stamens rarely all fertile and antheriferous, usually the posterior and rarely the anterior reduced to staminodes ending in sterile blades
- 4a. Leaves without glands
- 5a. Trees; gods flat, smooth; leaflets $\pm 2 \times 1$ cm *C. siamea* 8
- 5b. Shrubs; pods with two wings; leaflets $9 - 16 \times 3.5 - 10$ cm *C. alata* 2
- 4b. Leaves with one or more glands
- 6a. Glands between each pair of leaflet excepting the terminal; anthers with continuous sutures over the entire length *C. auriculata* 3
- 6b. Glands on or near the base of the rachis; sutures variously limited to different lengths in all anthers
- 7a. Plants fully hirsute *C. hirsuta* 5
- 7b. Plants fully glabrous *C. occidentalis* 7

1. *Cassia absus* Linn., Sp. Pl. 376. 1753; Wt. et Arn., Prodr. 291. 1834; Baker in Hook. f., Fl. Brit. Ind. 2: 265. 1878; Gamble, Fl. Presid. Madras 1 (3): 403. 1919; de Wit, Webbia 11: 279. 1955. *Senna absus* Roxb., Fl. Ind. 2: 340. 1832.

Erect herbs, 20-30 cm high; branches grey bristly. Leaves 1-pinnate, up to 4.5 cm long; leaflets 2 pairs, $0.6 - 2.2 \times 0.5 - 1.8$ cm, elliptic-oblong, rounded at apex, oblique at base. Flowers reddish-yellow in terminal or leaf-opposed erect cymes. Pods 2-3.5 cm long, compressed, bristle-hairy.

Fl. & Fr.: September-December.

Common in the Agricultural estate above Five falls.

2. *Cassia alata* Linn., Sp. Pl. 378. 1753; Wt. et Arn., Prodr. 287. 1834; Baker in Hook. f., Fl. Brit. Ind. 2: 264. 1878; Gamble, Fl. Presid. Madras 1 (3): 404. 1919; de Wit, Webbia 11: 231. 1955. *Elakajam*, *Chimayakatti* (Malayalam). *Ancali*, *Cimaiyagatti* (Tamil).

Shrubs, 1-3.5 m high; branches glabrous. Leaves 1-pinnate; leaflets 5-12 pairs, $9 - 16 \times 3.5 - 10$ cm, oblong, rounded at apex, obliquely truncate at base. Flowers yellow, foetid, in short axillary racemes. Pods $12 - 18 \times 1 - 2$ cm, thin, longitudinally winged.

Fl. & Fr. : April - October.

A weed around Main falls.

3. *Cassia auriculata* Linn., Sp. Pl. 379. 1753 ; Wt. et Arn., Prodr. 290. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 263. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 402. 1919 ; de Wit, Webbia 11 : 234. 1955. *Aviram*, *Ponnaviram* (Malayalam). *Avaram*, *Avarai* (Tamil).

Shrubs, 0.5 - 2 m high ; branches soft hairy. Leaves 1 - pinnate ; leaflets 8 - 12 pairs, 1.8 - 2.6 × 0.8 - 1.3 cm, elliptic, obtuse, glabrous or dawy, mucronate at apex, rounded at base ; stipules foliaceous. Flowers yellow in axillary or terminal corymbs. Pods 7 - 12.5 × 1 - 1.5 cm, oblong, flat, deeply depressed between seeds.

Fl. & Fr. : August - March.

A weed, common in the outskirts and waste places.

4. *Cassia fistula* Linn., Sp. Pl. 377. 1753 ; Wt. et Arn., Prodr. 285. 1834 ; Wt., Ic. t. 269. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 261. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 400. 1919 ; de Wit, Webbia 11 : 207. 1955. *Konna*, *Kanikonna*, *Kattarungulam* (Malayalam). *Appai*, *Aragonum*, *Konnei* (Tamil).

Deciduous trees, 8 - 12 m high ; branches smooth, glabrous. Leaves 1 - pinnate ; leaflets 4 - 8 pairs, 5 - 12.5 × 3.5 - 10 cm, ovate, glabrous above, pale and slightly tomentose beneath, acute at apex, rounded at base. Flowers bright yellow in lax, pendulous racemes. Pods 30 - 60 cm long, cylindrical, pendulous.

Fl. & Fr. : March - February.

An ornamental tree in the gardens and avenues, naturalized in the outskirts of the forests.

5. *Cassia hirsuta* Linn., Sp. Pl. 378. 1753 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 263. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 401. 1919 ; de Wit, Webbia 11 : 250. 1955. *C. tomentosa* Wall. (Cat. no. 5304. 1831 - 32. *nom. nud.*) ex Baker in Hook. f., Fl. Brit. Ind. 2 : 263. 1878 ; Wt. et Arn., Prodr. 268. 1834 (*non*. Linn.).

Shrubs or undershrubs, 2 - 2.5 m high ; branches hairy. Leaves 1 - pinnate ; leaflets 3 - 5 pairs, 3 - 6.5 × 1.5 - 4.5 cm, ovate, villous, acuminate at apex, acute or rounded at base. Flowers yellow with a bad smell in axillary or terminal racemes. Pods 9 - 14 cm long, hirsute.

Fl. & Fr. : Almost throughout the year.

Rare in the open places of the forest.

6. *Cassia mimosoides* Linn., Sp. Pl. 379. 1753 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 266. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 403. 1919 ; de Wit, Webbia 11 : 283. 1955. *C. angustissima* Lamk., Enc. Meth. Bot. 650. 1783 ; Wt. et Arn., Prodr. 292. 1834.

Trailing herbs, 30-60 cm long ; branches wiry, appressed pubescent. Leaves 1 pinnate ; leaflets 25-50 pairs, 0.4-0.6 × 0.1-0.2 cm, subfalcate, chartaceous, sparsely ciliate along the margins, acute at apex, truncate at base. Flowers solitary, or 2-3 in supra-axillary clusters. Pods up to 4.5 × 0.5 cm, strap-shaped, hairy, obscurely grooved between seeds.

Fl. & Fr. : August-December.

Common in the cleared areas of Agricultural estate above Five falls.

Notes : Eventhough de Wit (*loc. cit.*) recorded erect plants reaching 1.5 m high for this species, those plants at Courtallum were always decumbent and smaller. Moreover the plants appears as annuals here as against the perennial habit recorded by de Wit (*loc. cit.*) for plants from India. The leaves are sensitive to touch and light.

7. *Cassia occidentalis* Linn., Sp. Pl. 377. 1753 ; Wt et Arn., Prodr. 290. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 262. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 401. 1919 ; de Wit, Webbia 11 : 56. 1955. *Senna occidentalis* (Linn.) Roxb., Fl. Ind. 2 : 342. 1832. *Karintukara*, *Narumthakara*, *Ponnayiram* (Malayalam). *Narrangadagarai*, *Peyariari*, *Ponnayirai* (Tamil).

Undershrubs, 1-1.5 m high ; stem and branches glabrous. Leaves 1 pinnate ; leaflets 3-5 pairs, 2.5-8.2 × 1.2-3.8 cm, ovate-oblong, or oblanceate, thin, glabrous above, paler beneath, acute or attenuate at apex, rounded or oblique at base. Flowers yellow in axillary or terminal racemes. Pods up to 10.5 cm long, distantly torulose, transversely partitioned, glabrous.

Fl. & Fr. : August-December.

Common weed in the waste places, roadsides, etc. in the plains.

8. *Cassia siamea* Lamk., Enc. Meth. Bot. 1 : 648. 1785 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 264. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 402. 1919 ; de Wit, Webbia 11 : 263. 1955. *C. florula* Vahl, Symb. Bot. 3 : 57. 1794 ; Wt. et Arn., Prodr. 288. 1834. *Mannakkonna* (Malayalam). *Cimariayirai Konrai* (Tamil).

Trees, 10 - 12 m high ; branches often drooping. Leaves 1 pinnate ; leaflets 7 - 12 pairs, $\pm 2 \times 1$ cm, elliptic-oblong or ovate-oblong, glabrous, mucronate at apex, rounded at base. Flowers yellow in terminal leafy panicles. Pods 12 - 15 cm long, flat.

Fl. & Fr. : August - March.

Quite common in the dry deciduous outskirts around Tiger falls and Old Courtallum falls.

3. *DELONIX* Raf.

Delonix regia (Bojer ex Hook.) Raf., Fl. Tell. 2 : 92. 1836. *Poinciana regia* Bojer ex Hook., Bot. Mag. t. 2884. 1829 ; Mast. in Hook. f. Fl. Brit. Ind. 2 : 260. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 396. 1919. *Gul Mohr* (Malayalam & Tamil).

Deciduous trees, 6 - 8 m high ; branches crown-shaped. Leaves 2-pinnate ; pinnae 8 - 20 pairs ; leaflets 15 - 20 pairs per pinna, 0.5 - 1 cm long. Flowers bright scarlet in axillary or terminal lax racemes. Pods up to 75 cm long, flat.

Fl. : April - August.

An avenue tree often planted in gardens and along roadsides, naturalized below Shembagadevi.

45. MIMOSACEAE

- | | |
|--|------------------------|
| 1a. Huge lianas with tendrils | <i>Entada</i> 4 |
| 1b. Shrubs or trees without tendrils | |
| 2a. Stamens free or only shortly connate at base | |
| 3a. Stamens definite, free | |
| 4a. Plants unarmed | <i>Leucaena</i> 5 |
| 4b. Plants armed | |
| 5a. Pods lomented ; leaves sensitive to touch | <i>Mimosa</i> 6 |
| 5b. Pods not lomented ; leaves not sensitive to touch | |
| 6a. Stipules lanceate or subulate ; pods twisted when ripe | <i>Dichrostachys</i> 3 |
| 6b. Stipules small or absent ; pods not twisted when ripe | <i>Prosopis</i> 8 |

- 3b. Stamens indefinite, free or shortly connate at base *Acacia* 1
- 2b. Stamens monadelphous
- 7a. Plants unarmed ; each pinna with 10-25 leaflets *Albizia* 2
- 7b. Plants armed ; each pinna with a pair of leaflets *Pithecellobium* 7

1. ACACIA Mill.

- 1a. Armed trees with axillary thorns ; each leaf with 3-6 pairs of pinnae *A. ferruginea* 1
- 1b. Armed lianas with exomorphic prickles ; each leaf with 10-14 pairs of pinnae *A. torta* 2

1. *Acacia ferruginea* DC., Prodr. 2 : 458. 1825 ; Wt. et Arn., Prodr. 273. 1834 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 295. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 428. 1919. *Mimosa ferruginea* Roxb. (Hort. Beng. 4. 1814. *nom. nud.*) Fl. Ind. 2 : 561. 1832.

Armed trees, 6-10 m high ; branches glabrous ; thorns axillary. Leaves 5-11.5 cm long, glabrous ; pinnae 3-6 pairs ; leaflets 10-20 pairs, 0.4-1 × 0.2-0.4 cm, oblong-linear, obtuse at both ends. Flowers greenish-yellow, fragrant in axillary spikes. Pods 7.5-12.5 × 1.8-2.5 cm, lanceate, flat, reticulately veined, indehiscent ; seeds 2-8.

Fl. & Fr. : September-March.

Fairly common in the outskirts around Tiger falls and in the reserve forest block no. I near Old Courtallum falls.

2. *Acacia torta* (Roxb.) Craib, Kew Bull. 1915 : 410. 1915 ; Gamble, Fl. Presid. Madras 1 (3) : 428. 1919 ; Sant., J. Bombay Nat. Hist. Soc. 50 : 312. 1951. *Mimosa torta* Roxb., Fl. Ind. 2 : 556. 1832. *A. caesia* Wt. et Arn., Prodr. 278. 1834 (*non* Willd. 1806). *A. intsia* Willd., var. *caesia* (Wt. et Arn.) Baker in Hook. f., Fl. Brit. Ind. 2 : 297. 1878.

Climbing or straggling lianas, 5-8 m high. Leaves bipinnate, pinnae 10-14 pairs ; leaflets 25-40 pairs, touching each other but not overlapping, 0.4-0.6 × 0.2-0.4 cm, oblong-falcate, apiculate at apex, truncate at base. Flowers pale white in globose heads. Pods 15-20 cm long, thin, flat, brown-velvety when young.

Fl. & Fr. : September-December.

Common in the dense forests especially along the sides of deep ravines around Chittaruvu, Shembagadevi, Honey falls and Five falls.

2. ALBIZIA Durr.

- 1a. Leaflets falcate, less than 1 cm in length ; pinnae of several pairs *A. chinensis* 1
- 1b. Leaflets oblong or ovate, often more than 2 cm in length ; pinnae 3-5 pairs
 - 2a. Flowers sessile
 - 3a. Leaflets obliquely ovate, broad and rounded at base, narrow and attenuate on the lower side of the midrib ; pods thin *A. procera* 4
 - 3b. Leaflets oblong ; pods moderately thick *A. odoratissima* 3
 - 2b. Flowers pedicelled ; leaflets broadly-oblong ; pods thin *A. lebbeck* 2

1. *Albizia chinensis* (Osbeck) Merr., Am. J. Bot. 3 : 575. 1916. *Mimosa chinensis* Osbeck, Dag. Ostind. Resa 233. 1757. *M. stipulata* Roxb., (Hort. Beng. 40. 1814. *nom. nud.*) Fl. Ind. 2 : 549. 1824. *Acacia stipulata* (Roxb.) DC., Prodr. 2 : 469. 1825 ; Wt. et Arn., Prodr. 274. 1834. *Albizia stipulata* Boiv., Encyl. 19. siecl. 2 : 33. 1838 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 300. 1878. *Albizia marginata* Merr. ; Gamble, Fl. Presid. Madras 1 (3) : 433. 1919.

Deciduous trees, 3-6 m high. Leaves evenly bipinnate ; leaflets up to 0.7×0.2 cm, falcate, ciliate along the margins and midrib, acute at apex, truncate at base ; midrib close to the upper edge. Flowers pink in terminal and axillary panicles of globose heads. Pods $\pm 16.5 \times 4$ cm, flat, thin, ridged along the sides, reddish brown when dry.

Fl. & Fr. : November - March.

Very rare along the sides of the stream below Shembagadevi.

2. *Albizia lebbeck* (Linn.) Benth. in Hook. Lond. J. Bot. 3 : 87. 1844 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 298. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 432. 1919. *Mimosa lebbeck* Linn., Sp. Pl. 516. 1753. *Acacia speciosa* (Linn.) Willd., Sp. Pl. 4 : 1066. 1806 ; Wt. et Arn., Prodr. 275. 1834.

Deciduous trees, 10-15 m high ; young branches tomentose. Leaves bipinnate, 10-20 cm long ; pinnae 2-4 pairs ; leaflets 5-9 pairs,

2.5-3.5 × 1-1.5 cm, oblong or oval, rounded at apex, obliquely rounded or truncate at base. Flowers white, fragrant in terminal or axillary globose umbellate heads. Pods 4-10 × 1.5-2.5 cm, flat, straw-coloured.

Fl. & Fr. : March November.

Common around Tiger falls and below Chittaruvi.

3. *Albizia odoratissima* (Linn. f.) Benth. in Hook., Lond. J. Bot. 3 : 88. 1844 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 229. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 431. 1919. *Mimosa odoratissima* Linn. f., Suppl. 437. 1781. *Acacia odoratissima* Willd., Sp. Pl. 4 : 1063. 1806 ; Wt. et Arn., Prodr. 275. 1834.

Deciduous trees, 15-20 m high ; young branches pubescent. Leaves 15-25 cm long ; pinnae 3-5 pairs ; leaflets 1.5-3 × 1-1.5 cm, sessile, oblong, rounded at apex and base. Flowers white, fragrant in terminal or axillary umbellate heads. Pods 10-16 × 2-3 cm, straight with a blunt apex, brown ; seeds 8-12.

Fl. & Fr. : April March.

In the reserve forests before Old Courtallum the plant is common in the valleys between the two hills and also below Shembagadevi and around Main falls.

4. *Albizia procera* (Roxb.) Benth. in Hook., Lond. J. Bot. 3 : 89. 1844 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 299. 1875 ; Gamble, Fl. Presid. Madras 1 (3) : 431. 1919. *Mimosa procera* Roxb., Pl. Corom. 2 : 12, t. 121. 1798. *Acacia procera* Willd., Sp. Pl. 4 : 1063. 1806 ; Wt. et Arn., Prodr. 275. 1834.

Deciduous trees, 8-15 m high ; branches glabrous. Leaves bipinnate, 20-40 cm long ; pinnae 3-5 pairs ; leaflets 7 pairs, subsessile, 1.5-3.5 × 0.7-2 cm, obliquely-ovate, obtuse at apex, broad and rounded at base. Flowers greenish-white in terminal paniculate umbellate heads. Pods 12-20 × 2-3 cm, straight, with thick margins ; seeds 8-12.

Fl. & Fr. : April March.

Fairly common in the outskirts of the forest around Old Courtallum falls.

3. *DICHROSTACHYS* (A. DC.) Wt. et Arn. *nom. gen. cons.*

Dichrostachys cinerea (Linn.) Wt. et Arn., Prodr. 171. 1834 ; Wt., Ic. t. 357. 1840 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 288. 1878 ; Gamble, Fl.

Presid. Madras 1 (3) : 419. 1919 ; Brennan, Kew Bull. 1957 : 358. 1957. *Mimosa cinerea* Linn., Sp. Pl. 520. 1753. *Dichrostachys cinerea* (Willd.) Wt. et Arn., Prodr. 271. 1834 ; Brennan, Kew Bull. 1956 : 188. 1956. *Cailliea cinerea* (Linn.) Macbr., Contr. Gray Herb. Harv. (n. s.) 59 : 16. 1919.

Armed trees, 4-6 m high ; branchlets spinescent. Leaves pinnate, 3-6.4 cm long ; pinnae 8-14 pairs ; leaflets minute, linear, close, sub-acute at apex, oblique at base. Flowers numerous in axillary or extra-axillary spikes, about 3.8 cm long ; upper half of the spike yellow, lower half rose-coloured. Pods $5-7.5 \times 0.7-0.8$ cm, much twisted, glabrous, dark brown, irregularly dehiscent ; seeds 6-10, obovate, compressed.

Fl. & Fr. : Almost throughout the year.

Common above Old Courtallum falls and on the way to Tekkumalai.

4. ENTADA Adans. *nom. gen. cons.*

Entada pursaetha DC., Prodr. 2 : 425. 1825 ; Wt. et Arn., Prodr. 267. 1834 ; Brennan, Kew Bull. 1955 : 164. 1955 ; Sant., J. Bombay Nat. Hist. Soc. 57 : 239. 1960 & in Bull. Bot. Surv. India 3 : 16. 1961. *Mimosa entada* Linn., Sp. Pl. 518. 1753. *Entada scandens sensu* Baker in Hook. f., Fl. Brit. Ind. 2 : 236. 1878. (*non* Benth.) ; Gamble, Fl. Presid. Madras 1 (3) : 417. 1919.

Huge lianas, 15-20 m high. Leaves bipinnate ; main rhachis grooved, ending in bifid tendrils ; pinnae 2-3 pairs ; leaflets $3.8-7 \times 1.5-3$ cm, oblong, coriaceous, glabrous, obtuse at apex, acute at base. Flowers green turning white and at maturity yellow, with a light bad smell, in axillary or terminal solitary or panicle spikes. Pods up to 12.5×8.5 cm, ± 4 cm thick, with an enlarged peduncle, ± 30 cm long ; seeds up to 6×2.5 cm, orbicular, brown.

Fl. & Fr. : April - December.

Rare, along the sides of the stream above Five falls.

5. LEUCAENA Benth.

Leucaena leucocephala (Lamk.) de Wit, Taxon 10 : 53. 1961. *Mimosa leucocephala* Lamk., Enc. Meth. Bot. 1 : 12. 1783. *Leucaena glauca* Benth. in Hook., Lond. J. Bot. 4 : 416. 1842 ; Baker in Hook. f.,

Fl. Brit. Ind. 2: 290. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 419. 1919.

Unarmed shrubs, 2-3 m high. Leaves bipinnate ; pinnae 3-6 pairs; leaflets 10-15 pairs, linear, glabrous above, hairy beneath. Flowers white in globose heads of 2-4 cm diameter. Pods 10-15 cm long, flat, brown ; seeds 15-20 per pod, brown.

Fl. & Fr. : August November.

Very rare in the dry outskirts at Five falls.

6. MIMOSA Linn.

Mimosa pudica Linn., Sp. Pl. 518. 1753 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 291. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 421. 1919.

Armed, prostrate herbs, up to 0.5 m long ; branches tomentose. Leaves bipinnate ; pinnae 2-4, digitate ; leaflets 10-20 pairs, $\pm 0.8 \times 0.5$ cm, linear-oblong, bristly beneath. Flowers pinkish-white in axillary globose heads. Pods ± 1.5 cm long, moniliform, prickly.

Fl. & Fr. : July October.

A common weed in waste places and plains all over the area.

7. PITHECELLOBIUM Mart. *nom. gen. et orth. cons.*

Pithecellobium dulce (Roxb.) Benth. in Hook., Lond. J. Bot. 3 : 199. 1844 ; Baker in Hook. f., Fl. Brit. Ind. 2 : 302. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 434. 1919. *Mimosa dulcis* Roxb., Pl. Corom. 1 : 67, t. 99. 1795. *Inga dulcis* Willd. Sp. Pl. 4 : 1105. 1806 ; Wt. et Arn., Prodr. 268. 1834 ; Wt., Ic. t. 198. 1838.

Armed trees with straggling terminal branches, 6-8 m high ; spines stipular. Leaves bipinnate, each pinna with a pair of leaflets ; leaflets 3-4.5 \times 1-5.3 cm, oblong, glabrous, bluntly acute or ovate at apex, oblique or subacute at base. Flowers white in terminal or axillary racemose heads. Pods up to 14 \times 1 cm, constricted between seeds.

Fl. & Fr. : January May.

Fairly common around Tiger falls.

8. *PROSOPIS* Linn.

Prosopis cineraria (Linn.) Druce, Rep. Bot. Exch. Cl. Brit. Isles 3 : 422. 1914. *Mimosa cineraria* Linn., Sp. Pl. 517. 1753. *Prosopis spicigera* Linn., Mant. 68. 1767 ; Wt. et Arn., Prodr. 271. 1834 ; Roxb., Pl. Corom. t. 63. 1796 ; Baker in Hook f., Fl. Brit. Ind. 2 : 288. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 419. 1919.

Armed trees, 4-6 m high. Leaves bipinnate, pinnae two pairs ; leaflets 7-12 pairs, 1-1.5 cm long, oblong, glabrous, oblique at base. Flowers greenish in axillary spikes. Pods 15-20 cm long, cylindrical ; seeds 10-15, ovoid.

Fl. & Fr. : January May.

Common around Tiger falls and in the forest outskirts at Main falls.

46. *PODOSTEMACEAE*

POLYPLEURUM (Tayl. ex Tul. corr.) Warming

Polypleurum stylosum (Wt.) J. B. Hill, Kew Bull. 26 : 131. 1971. *Dicraeia stylosa* Wt., Ic. t. 1917. 1852 ; Gamble, Fl. Presid. Madras 2 (7) : 1196. 1925 ; Subr., Aquat. Angio. 47. 1962. *Podostemon stylosus* (Wt.) Benth., Gen. Pl. 3 : 112. 1880 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 64. 1886.

Submerged, free floating herbs, attached to rocks at the base ; stem thalloid, up to 15 cm long, freely branched. Flowers along the margins of the stem, spathaceous, spathes splitting at the top ; pedicels 1.5-3 cm long, filiform, with few scales at the base. Capsules ribbed.

Fl. : November December.

Rare, in the flowing water of Chittar in Tekkumalai at an altitude of about 1200 metres.

47. *HALORAGACEAE*

MYRIOPHYLLUM Ponted. ex Linn.

Myriophyllum oliganthum (Wt. et Arn.) F. Muell., Fragm. 10 : 54. 1876 ; Meijden, Blumea 17 : 308. 1969. *Haloragis oligantha* Wt. et Arn., Prodr. 338. 1834 (non Arn. 1836). *Myriophyllum intermedium* auct. non DC. ; Wt., Ill. Ind. Bot. t. 108. 1850 (excl. f. 8 of fruit) ; Clarke in Hook.

f., Fl. Brit. Ind. 2 : 433. 1878 excl. syn. *M. variaefolium* Hook. f.; Schindl. in Engl., Pflanzenr. 23 : 96. 1905 ; Gamble, Fl. Presid. Madras 1 (4) : 454. 1919 ; Subr., Aquat. Angio. 17. 1962. *M. indicum* (non Willd.) Trimen, Handb. Fl. Ceylon 2 : 149. 1894 (*pro parte*).

Floating or rooted, aquatic herbs. Leaves submerged ; lower ones pinnated, up to 3 cm long ; upper ones sessile, up to 2.5×0.2 cm, spatulate or linear, entire or serrate towards apex, narrowed at base. Flowers reddish, unisexual, axillary towards apex ; female flowers sessile ; male flowers shortly pedicelled. Capsules 4-furrowed, separating into 4 or 2 cocci, tubercled.

Fl. & Fr. : May February.

Common in the shallow ponds like Thamarakulam on the way to Five falls.

48. LYTHRACEAE

1a. Placenta of the ovary not continuous with the style ;
fruits indehiscent

Ammannia 1

1b. Placenta of the ovary continuous with style ; fruits
irregularly dehiscent

Nesaea 2

1. AMMANNIA Linn.

Ammannia baccifera Linn., Sp. Pl. ed. 2 : 175. 1762 ; Clarke in Hook. Fl. Brit. Ind. 2 : 569. 1879 ; Koehne. Bot. Jahrb. 1 : 258. 1880 & in Engl., Pflanzenr. 4, 216 : 53. 1906 ; Gamble, Fl. Presid. Madras 1 (3) : 510. 1919 *A. salicifolia* Hiern in Oliv., Fl. Trop. Africa 2 : 278. 1871 (excl. syn. *non*. Monti) ; Clarke, *loc. cit.*

Semiaquatic, erect herbs, 30-60 cm high ; branches angular, purplish. Leaves sessile, $1.8-2.4 \times 0.3-1.2$ cm, oblong-lanceate, subacute at apex, subcordate at base. Flowers greenish, in axillary, sessile clusters. Capsules globose, reddish, indehiscent ; seeds subhemispherical, excavated on the plane face, dark brown.

Fl. & Fr. : October-January.

Common in the dried bottom of Tippakulam.

2. NESAEA Comm. ex Juss.

Nesaea brevipes Koehne, Bot. Jahrb. 3 : 326. 1882 & in Engl., Pflanzenr. 4, 216 : 226. 1903 ; Gamble, Fl. Presid. Madras 1 (3) : 510. 1919.

Ammannia cordata Wt. et Arn., Prodr. 304. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 570. 1879.

Herbs, 20-45 cm high ; stem glabrous, tetragonous, rooting at lower nodes. Leaves sessile 1.5-2.5 × 0.5-1.5 cm, oblong, acute at apex, narrowed or cordate at base. Flowers sessile, 2-5 in the axils of leaves, bracteolated at base ; seeds many, hemispherical.

Fl. & Fr. : April.

Courtaillum (Robert Wight 273, CAL).

49. MYRTACEAE

Syzygium Gaertn. *nom. gen. cons.*

Syzygium cumini (Linn.) Skeels, U. S. Dept. Agric. Bur. Pl. Ind. Bull. 248 : 25. 1912 ; Merr. et Perry, J. Arnold Arbor. 19 : 108. 1938. *Myrtus cumini* Linn., Sp. Pl. 471. 1753. *Eugenia jambolana* Lamk., Enc. Meth. Bot. 2 : 198. 1789 ; Wt., Ic. t. 535. 1842 (probably) ; Duthie in Hook. f., Fl. Brit. Ind. 2 : 499. 1889. *Syzygium jambolanum* (Lamk.) DC., Prodr. 3 : 259. 1828 ; Wt. et Arn., Prodr. 329. 1834 ; Gamble, Fl. Presid. Madras 1 (3) : 481. 1919. *Naval*, *Nanga*, *Perumnnaval* (Malayalam). *Cambu*, *Kottainagam*, *Cambal*, *Naval* (Tamil).

Large spreading trees, 8-12 m high ; roots buttressing. Leaves 5.5-10.5 × 3.5-5 cm, elliptic-oblong, coriaceous, entire, shiny and glabrous, gland-dotted, acuminate at apex, ovate at base : intramarginal veins prominent ; petioles 1.5-2 cm long, reddish. Flowers pale-white, fragrant in terminal and axillary panicles. Berries 1-1.5 cm long, ovoid, glabrous, purple, fleshy ; seed one, globose.

Fl. & Fr. : May - November.

Fairly common around Tiger falls, Main falls and Shembagadevi.

Notes : The fruits of this plant are edible and the tribal people are much fond of it. The fruits are produced in large bunches, and the whole tree is covered with it during the season. The economic value of the species as a fruit-tree for cultivation is recomendable.

50. ONAGRACEAE

LUDWIGIA Linn.

- 1a. Erect shrubs, 1-2 m high ; branches pubescent with long, erect hairs ; capsules 3-5 cm long *L. octovalvis* subsp. *sessiliflora* 1

- 1b. Erect or suberect herbs, up to 60 cm high ; branches glabrous or minutely pubescent ; capsules up to 0.6 cm long

L. perennis 2

1. *Ludwigia octovalvis* (Jacq.) Raven subsp. *sessiliflora* (Mich.) Raven, Kew Bull. 15 : 476. 1962 & in Reinwardtia 6 : 362. 1963. *Jussiaea octonervia* form *sessiliflora* Mich. in Mart., Fl. Bras. 13 (2) : 171. 1875. *J. suffruticosa* Linn., Sp. Pl. 1 : 388. 1753 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 587. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 516. 1919. *J. villosa* Lamk., Enc. Meth. Bot. 3 : 331. 1789. *Karyampu. Kattukarykampu* (Malayalam). *Kattukirambu Kirambuppundu. Nirkkirambu* (Tamil).

Erect shrubs, 1-2 m high ; branches pubescent with erect hairs. Leaves 2-3.5 × 1-1.5 cm, subovate to lanceate, entire, sparsely hairy on both sides, acute at apex, narrowed at base ; petioles obscure. Flowers yellow, solitary, axillary ; calyx lobes 1-1.5 cm long. Capsules 3-5 cm long, pubescent or hairy, crowned by the calyx lobes.

Fl. & Fr. : November - March.

Very rare below New falls in the humus soil accumulated between rocks.

2. *Ludwigia perennis* Linn., Sp. Pl. 119. 1753 (excl. *verba falsa*, '*foliis oppositis*') ; Raven, Kew Bull. 15 : 476. 1962 & in Reinwardtia 6 : 367. 1963. *Jussiaea perennis* (Linn.) Breman, Kew Bull. 8 : 163. 1953. *Ludwigia parviflora* Roxb., (Hort. Beng. 11. 1814 *nom. nud.*) Fl. Ind. 1 : 440. 1820 ; Wt., Ill. Ind. Bot. t. 101. 1840 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 588. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 517. 1919.

Erect or suberect herbs up to 60 cm high ; branches more or less angular, subglabrous or minutely pubescent. Leaves up to 1.2 × 0.3 cm, elliptical to lanceate, entire, glabrous, subacute at apex, narrowly cuneate at base ; petioles 0.2-0.8 cm long, winged. Flowers yellow, solitary, axillary. Capsules up to 0.6 cm long, linear, absolutely 4-sided, smooth, 4-valved ; seeds many, minute, ellipsoid.

Fl. & Fr. : July—November.

Aquatic, semiaquatic or terrestrial, along the sides of the stream below Shembagadevi and around Main falls.

51. MELASTOMATACEAE

- 1a. Woody shrubs or small trees ; fruits drupaceous

Memecylon 1

- 1b. Herbs or shrubs ; fruits capsular opening by pores or valves

- 2a. Flowers in scorpioid cymes ; petals 3 ; capsules
valvular *Sonerila* 3
- 2b. Flowers in capitate or paniced inflorescence ;
petals 4 or 5 ; capsules porocidal *Osbeckia* 2

1. MEMECYLON Linn.

- 1a. Leaves subcordate at base *M. malabaricum* 3
- 1b. Leaves obtuse, acute or attenuated at base
- 2a. Flowers pedicelled, in axillary pedunculate or
umbellate cymes
- 3a. Flowers purplish or violet ; leaves linear-
lanceate *M. angustifolium* 1
- 3b. Flowers blue ; leaves elliptic or ovate *M. umbellatum* 4
- 2b. Flowers sessile or subsessile in fascicles *M. heyneanum* 2

Memecylon angustifolium Wt. Ill. Ind. Bot. 1 : 215. 1840 & Ic. t. 276. 1840 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 562. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 504. 1919. *Arukanila* (Malayalam). *Vellaikaya* (Tamil)).

Woody shrubs, 2-3 m high; branches glabrous, slightly swollen at nodes. Leaves 4.5-8.5 × 0.6-1.2 cm, linear-lanceate, thick, obtuse or acuminate at apex, obtuse or acute at base ; intramarginal veins close to the margins, ascending. Flowers purplish or violet, pedicelled in pedunculate cymes. Capsules ± 0.6 cm long, subglobose, purplish-black when ripe.

Fl. & Fr. : July December.

Rare, in the sholas around Honey falls.

2. Memecylon heyneanum Benth. (Wall. Cat. 4102. 1828-1849 *nom. nud.*) *ex* Wt. et Arn., Prodr. 319. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2: 560. 1879 ; Gamble, Fl. Presid Madras 1 (3) : 503. 1919. *M. jambosoides* Wt., Ic. t. 277. 1840.

Shrubs ; leaves 13-18 × 4-5.5 cm, lanceate, acute or obtuse at apex, acute or blunt at base ; intramarginal veins very prominent, connected with the midrib by several prominent straight nerves. Flowers axillary or later fascicled in tubercles.

Fl.: July.

Courtallum (*Robert Wight s.n.*, 1070, CAL).

3. *Memecylon malabaricum* (Clarke) Cogn. in DC., Mon. Phan. 7 : 1148. 1891; Gamble, Fl. Presid. Madras 1 (3) : 505. 1911. *M. amplexicaule* var. *malabarica* Clarke in Hook. f., Fl. Brit. Ind. 2 : 559. 1879.

Woody shrubs, 3-4.5 m high ; branches terete, nodes swollen. Leaves up to 13.5×5.5 cm, oblong-lanceate, thick, glabrous, obtusely acute at apex, subcordate at base ; petioles ±0.2 cm long, thick. Flowers violet in axillary clusters up to 1.5 cm in diameter, subsessile. Berries 0.6-0.8 cm in diameter, subglobose, yellowish-red.

Fl. & Fr. : December-March.

Common along the slopes below Kailasamottai.

Notes : Gamble (*loc. cit.*) recorded this endemic species only from the sholas of Nilgiris and Pulney hills. The collection of it from the ever-green forests of Courtallum shows a further southward range of distribution for the species.

4. *Memecylon umbellatum* Burm. f., Fl. Ind. 87. 1768 ; Wt. et Arn., Prodr. 319. 1834 ; Gamble, Fl. Presid. Madras 1 (3) : 504. 1919. *M. edule* Roxb., Pl. Corom. 1 : 82. 1798 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 563. 1879 (excl. vars.); Cogn. in DC., Mon. Phan. 7 : 1155. 1871 (*pro parte*). *M. edule* var. *ramiflora* Clarke in Hook. f., Fl. Brit. Ind. 2 : 563. 1879. *M. tinctorium* Koen. ex Wt. et Arn., Prodr. 319. 1834 ; Wt., Ill. Ind. Bot. 93. 1840. *Kanali*, *Kanalikaya* (Malayalam). *Kaya* (Tamil).

Woody shrubs, 1-2 m high ; branches terete, nodes swollen. Leaves 3.5-6.5×1.5-3 cm, elliptic or ovate, thick, smooth and green above, pale beneath, subacute or bluntly acuminate at apex, attenuated or rounded at base ; midrib prominent, lateral veins obscure ; petioles up to 0.5 cm long. Flowers deep blue in axillary umbellate cymes. Berries up to 0.5 cm in diameter, globose, greenish-yellow, crowned by the calyx at apex.

Fr. & Fr. : March-July.

Common in the rocky forest floor in dry areas.

2. OSBECKIA Linn.

1a. Flowers pentamerous

2a. Leaves obovate with usually a blunt acumen at apex ; bristles on the calyx tube simple

O. aspera 1

2b. Leaves elliptic, acute at both ends ; bristles on the calyx tube tufted

O. wightiana 3

1b. Flowers tetramerous

- 3a. Stem appressed hairy ; anthers beaked at apex ; leaves oblong-lanceate *O. zeylanica* 4
- 3b. Stem sparsely hairy ; anthers not beaked but truncate at apex ; leaves ovate or elliptic *O. muralis* 2

1. *Osbeckia aspera* (Linn.) Bl., Flora 474. 1831 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 519. 1879 (excl. var. 2) ; Cogn. in DC., Mon. Phan. 7 : 315. 1891 ; Gamble : Fl. Presid. Madras 1 (3) : 492. 1919 ; C. Hansen, Ginkgoana 4 : 80. 1977. *Melastoma asperum* Linn., Sp. Pl. 389. 1753.

Shrubs ; branches twiggy. Leaves 2-3 × 1.5-2.5 cm, obovate, 3-nerved from the base, bristled on both the surfaces, bluntly and shortly acuminate at apex, acute or obtuse at base. Flowers in terminal capitate inflorescence.

Fl. & Fr. : November.

Courtallum (M. Rama Rao's Coll. 1944, CAL).

2. *Osbeckia muralis* Naud., Ann. Sci. Nat. ser. 3, 14 : 56. 1850 ; C. Hansen, Ginkgoana 4 : 41. 1977. *O. truncata* D. Don ex Wt. et Arn., Prodr. 322. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 514. 1879 ; Cogn. in DC., Mon. Phan. 7 : 327. 1891 ; Gamble, Fl. Presid. Madras 1 (3) : 494. 1919. *O. zeylanica* Steud. ex Naud., Ann. Sci. Nat. ser. 3, 14 : 56. 1850 (*pro syn*).

Erect herbs, 10-40 cm high ; stem subterete or obscurely 4-angled, sparsely hairy. Leaves 2.5-5.5 × 1-2.5 cm, ovate or elliptic, ciliate, or strigose, subacute at apex, acute or obtuse at base, drying greenish ; petioles 0.2-0.3 cm long, hairy. Flowers rose-coloured, capitate or paniced at the apex of branches ; calyx ± 0.4 cm long with a cluster of bristles at the apex. Capsules 0.5-0.7 cm long, opening by terminal pores.

Fl. & Fr. : October—January.

A monsoon herb, common in the wet patches of soil between rocks above Chittaruv.

3. *Osbeckia wightiana* Benth. (Wall. Cat. 4060. 1828-49 *nom. nud.*) ex Wt. et Arn., Prodr. 323. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 519. 1879 ; Cogn. in DC., Mon. Phan. 7 : 318. 1891 ; Gamble, Fl. Presid. Madras 1 (3) : 493. 1919. *O. aspera* (Linn.) Bl. var. *wightiana* (Benth. ex Wt. et Arn.) Trim., Fl. Ceylon 2 : 196. 1894 ; C. Hansen, Ginkgoana 4 : 85. 1977.

Shrubs ; stem subterete, reddish with appressed bristles. Leaves up to 7.5 × 3.5 cm, elliptic, bristled on both sides, acute at apex and base ;

petioles 0.3 to 0.5 cm long, hairy. Flowers in terminal panicles. Capsules \pm 1 cm long, hairy.

Fl. & Fr. : February.

Courtallum (Robert Wight 1087, 1089, CAL).

4. *Osbeckia zeylanica* Linn. f., Suppl. 215. 1781 ; Wt. et Arn., Prodr. 322. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 516. 1879 ; Cogn. in DC., Mon. Phan 7 : 326. 1891 ; Gamble, Fl. Presid. Madras 1 (3) : 494. 1919 ; C. Hansen, Ginkgoana 4 : 43. 1977.

Erect herbs, 15-30 cm high ; stem and branches tetragonous, the angles clothed with appressed hairs. Leaves 2-3.5 \times 0.5-1.5 cm, oblong-lanceate, strigose, bristle-ciliated, acute at both ends ; petioles obscure. Flowers purple in leafy capitate heads. Capsules \pm 0.6 cm long, truncate at apex.

Fl. & Fr. : September - December.

Common in the marshy soil between rocks above Chittaruvi.

3. *SONERILA* Roxb. *nom. gen. cons.*

Sonerila speciosa Zenk., Pl. Ind. 18. t.1838. et Ann. Sci. Nat. wer. 1, 4 : 151. 1850 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 534. 1879 ; Gamble, Fl. Presid. Madras 1 (3) : 499. 1919.

Erect herbs, 15-20 cm high ; stem thick, fleshy. Leaves 1.5-3 \times 1-1.8 cm, ovate, fleshy, bristle-serrate, glandular-pilose, acute at apex, rounded at base ; nerves 7-9 from the base ; petioles 0.5 to 1.2 cm long, glandular-pilose. Flowers in terminal scorpioid cymes. Capsules enclosed in the glandular, pilose calyx.

Fl. : July.

Courtallum (Robert Wight 1108, CAL).

52. COMBRETACEAE

1a. Climbing shrubs

2a. Flowers with 4-5 petals ; calyx deciduous

Combretum 3

2b. Flowers apetalous ; calyx persistent and accrescent in fruits

Calycopteris 2

1b. Erect shrubs or trees

- 3a. Flowers in spikes or racemes ; fruits ovoid,
obovoid or ellipsoid *Terminalia* 4
- 3b. Flowers in dense globose heads ; fruits
compressed *Anogeissus* 1

1. *ANOGEISSUS* Wall. ex Guill. et Perr.

Anogeissus latifolia (Roxb. ex DC.) Wall. (Cat. no. 4015. 1832 *nom. nud.*) ex Bedd., Fl. Sylvat. t. 15. 1869 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 450. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 466. 1919. *Conocarpus latifolius* Roxb. (Hort. Beng. 34 : 1814. *nom. nud.*) ex DC., Prodr. 3 : 17. 1828 ; Wt. et Arn., Prodr. 316. 1834 ; Wt., Ic. t. 994. 1845. *Marukunjiram*, *Malakaniram*, *Vellanava* (Malayalam). *Namai*, *Vellay-naga*, *Vekkali* (Tamil).

Deciduous trees, 10-12 m high ; bark smooth, grey. Leaves 3.5-8 × 2.5-4.5 cm, elliptic or elliptic-oblong, coriaceous, entire, glabrous, obtuse or shortly cuspidate at apex, rounded or cordate at base ; midrib pink ; petioles 0.5-1 cm long. Flowers yellowish in small dense axillary heads. Drupes in heads, compressed, 2-winged.

Fl. & Fr. : February August.

Common in the dry areas above Chittaruvi and on the way to Tekkumalai.

2. *CALYOPTERIS* Lamk.

Calyopteris floribunda (Roxb.) Lamk., Enc. Meth. Bot. 2 : 41. 1811 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 449. 1878 ; King, J. Asiat. Soc. Bengal 66 (2) : 333. 1897 ; Gamble, Fl. Presid. Madras 2 (3) : 467. 1919. *Getonia floribunda* Roxb., Corom. Pl. 1 : 61, t. 87. 1795 ; Wt. et Arn., Prodr. 315. 1834. *Pullanthivalli*, *Maravalli* (Malayalam). *Minnargodi* (Tamil).

Scandent shrubs, 3-6 m or more in height ; branches pubescent towards apex. Leaves 7-12 × 3.5-6 cm, ovate-lanceate, acuminate at apex, rounded at base ; petioles up to 1 cm long. Flowers greenish-yellow, sessile in dense axillary panicles towards the apex of branches. Fruits up to 1 cm long, ovoid

Fl. & Fr. : December April.

Fairly common as climbers or stragglers on hedge plants or trees.

3. *COMBRETUM* Loefl. *nom. gen. cons.*

- 1a. Fruits 3-3.5 cm across, rounded at base *C. latifolium* 1
 1b. Fruits up to 2 cm across, subacute at base *C. ovalifolium* 2

1. *Combretum latifolium* Bl., Bijdr. 641. 1825 (*non* D. Don, 1827).
C. extensum Roxb. *ex* D. Don, Trans. Linn. Soc. Lond. 15 : 414. 1827 ;
 Clarke in Hook. f., Fl. Brit. Ind. 2 : 458. 1878 ; King, J. Asiat. Soc.
 Bengal 66 (2) : 337. 1897 ; Gamble, Fl. Presid. Madras 1 (3) : 469. 1919.
Udangodi (Tamil).

Straggling shrubs, 6-8 m high ; young branches quadrangular.
 Leaves 6.5-12.5 × 2.5-5.5 cm, ovate-elliptic, glabrous, shortly acuminate
 at apex, subacute at base ; petioles ± 1 cm long. Flowers yellowish,
 scented, in long slender axillary spikes. Fruits ± 3 cm long, ovate, 4-
 winged.

Fl. & Fr. : January—March.

Rare, in the shrubby areas around Shembagadevi.

2. *Combretum ovalifolium* Roxb. (Hort. Beng. 28. 1814 *nom. nud.*)
 Fl. Ind. 2 : 226. 1832 ; Wt. *et* Arn., Prodr. 317. 1834 ; Clarke in Hook. f.,
 Fl. Brit. Ind. 2 : 458. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 469.
 1919. *Odai, Odaikkodi, Ulurai* (Tamil).

Large climbing shrubs ; branches glabrous. Leaves 5-10 × 3-6.5
 cm, ovate-lanceate, obtusely acuminate at apex, narrowed at base ; petio-
 les up to 1.5 cm long, channelled. Flowers white, sweet-scented in axil-
 lary or terminal panicked spikes. Fruits ± 2 cm long, 5-winged.

Fl. & Fr. : January—April.

Common around Shembagadevi.

4. *TERMINALIA* Linn. *nom. gen. cons.*

- 1a. Fruits winged or ridged prominently
 2a. Leaves shallowly crenate to serrate ; fruits
 5-angled *T. arjuna* 1
 2b. Leaves entire ; fruits 3-winged, one large and the
 other two small *T. paniculata* 3
 1b. Fruits not winged, obscurely ridged *T. gella* 2

1. *Terminalia arjuna* (Roxb. ex DC.) Bedd., Fl. Sylvat. t. 28. 1869 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 447. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 465. 1919 ; Blatter, J. Indian Bot. Soc. 8 : 259. 1929 ; Parkinson, Indian For. Rec. (n. s.) 1 : 12. 1937. *Pentaptera arjuna* Roxb. (Hort. Beng. 34. 1814 *nom. nud.*) ex DC., Prodr. 3 : 14. 1828. *Maruthu*, *Vellamaruthu* (Malayalam). *Kulammarudu*, *Nirmarudu* (Tamil).

Trees, 15-20 m high ; trunk buttressed, branches horizontally spreading ; bark smooth, flaking off as large thick pieces. Leaves 10-15 × 4-7 cm, oblong or elliptic-oblong, shallowly crenate-serrate, obtuse or acuminate at apex, narrowed at base. Flowers yellowish in axillary or terminal panicles. Drupes 2.5-4.5 cm long, obovoid, woody with 5 projecting angles, striated with numerous curved wings.

Fl. & Fr. : March August.

Deciduous trees, common at Tiger falls, Main falls and along roadsides.

2. *Terminalia gella* Dalz. in Hook., J. Bot. 3 : 227. 1840-41 ; Gamble, Fl. Presid. Madras 1 (3) : 464. 1919 ; Blatter, J. Indian Bot. Soc. 8 : 252. 1929. *T. bellerica* (Gaertn.) Roxb. *sensu* Clarke in Hook. f., Fl. Brit. Ind. 2 : 445. 1878 (*pro parte*). *Tanni*, *Tusham* (Malayalam). *Akkam*, *Caddagam* (Tamil).

Trees, 10-15 m high ; branchlets tawny pubescent. Leaves up to 23 × 12 cm, ovate or ovate-oblong, coriaceous, pubescent on both sides, rounded at apex, narrowed at base ; petioles 1.5—2.5 cm long, glandular at apex. Flowers yellowish in axillary or terminal daisy-like panicles. Drupes ovoid or ellipsoid, minutely tomentose.

Fl. & Fr. : March—July.

One of the rare trees near Tekkumalai.

3. *Terminalia paniculata* Roxb. ex Roth, Nov. Sp. Pl. Ind. Or. 383. 1821 ; Wt. et Arn., Prodr. 315. 1834 ; Clarke in Hook. f., Fl. Brit. Ind. 2 : 448. 1878 ; Gamble, Fl. Presid. Madras 1 (3) : 465. 1919 ; Blatter, J. Indian Bot. Soc. 8 : 261. 1929. *Pentaptera paniculata* Roxb., (Hort. Beng. 34. 1814 *nom. nud.*) Fl. Ind. 2 : 442. 1824. *Marutu*, *Perumarutu*, *Pumaruthu* (Malayalam). *Ilaiikkadukai*, *Marudu*, *Peekarakai* (Tamil).

Trees, 6-12 m high ; branchlets rusty-tomentose. Leaves 10-18 × 4-8 cm, oblong, coriaceous, entire, pubescent beneath, rounded or acute at apex, rounded at base ; petioles up to 1.5 cm long, pubescent. Flowers yellowish, sessile in rusty-pubescent terminal or axillary spicate panicles.

Drupes 0.6-1.2 cm long, rusty tomentose, winged ; front wing 0.15 to 0.3 cm broad, the other 2 wings less than 0.2 cm broad.

Fl. & Fr. : March—August.

Fairly common above Chittaruvi along the sides of rocks and also on the way to Tekkumalai in the dry areas.

53. ALANGIACEAE

ALANGIUM Lamk. *nom. gen. cons.*

Alangium salvifolium (Linn. f.) Wanger. in Engl., *Pflanzenr.* 4, 20b : 9. 1910 ; Wt. et Arn., *Prodr.* 325. 1834 ; Gamble, *Fl. Presid. Madras* 1 (3) : 572. 1919 ; Bolemborgen, *Bull. Jard. Bot. Buitenz.* 16 : 149. 1938-40 ; Mukerjee, *Bull. Bot. Surv. India* 10 : 330-31. 1968. *Grewia salvifolia* Linn. f., *Suppl.* 409. 1781. *Alangium lamareckii* Thw., *Enum. Pl. Zeyl.* 133. 1859 ; Clarke in Hook. f., *Fl. Brit. Ind.* 2 : 741. 1879. *A. decapetalum* Lamk., *Enc. Meth. Bot.* 1 : 174. 1783 ; Wt., *lc.* t. 194. 1840.

Woody stragglers or trees 4-6 m high, unarmed or armed with spines. Leaves 7.5-15.5 × 2.5-5.5 cm, oblanceate, entire, acuminate at apex, narrowed or unequal at base ; petioles about 1 cm long. Flowers white, fragrant, in axillary fascicles. Drupes × 2 cm in diameter, subglobose or ellipsoid, ribbed when dry, crowned by the calyx, black.

Fl. & Fr. : March May.

Rare, above Five falls along the sides of the stream and also along hedges as arising from the ravines in Udayathan estate.

54. OLACACEAE

OLAX Linn.

Olax scandens Roxb., *Pl. Corom.* 2 : 2, t. 102. 1799 ; Wt. et Arn., *Prodr.* 89. 1834 ; Mast. in Hook. f., *Fl. Brit. Ind.* 1 : 575. 1875 ; Gamble, *Fl. Presid. Madras* 1 (1) : 190. 1915 ; Sleum. in Engl. & Prantl, *Pflanzenfam.* (ed. 2) 16b : 27. 1935. *O. wightiana* Wall. (Cat. no. 6779. 1832 *nom. nud.*) ex Wt. et Arn., *Prodr.* 89. 1834 ; Mast. *loc. cit.* ; Gamble, *loc. cit.* *Mallivepam, Kadalranchi* (Tamil).

Unarmed, scandent shrubs. Leaves 4.5-9 × 2.5-5 cm, ovate or oblong, entire, shiny above, pale beneath, obtuse or subacute at apex, rounded at base ; petioles 1-1.5 cm long, slightly ridged along the sides. Flowers white in lax axillary racemes. Drupes 0.5-1.3 cm long, subglobose with persistent, accrescent calyx.

Fl. & Fr. : February—April.

Occasional, along the sides of the ravines below Honey falls.

Notes : The concept of Sleumer (*loc. cit.*) to consider *O. scandens* and *O. wightiana* as conspecific is confirmed here based on the studies of the specimens at Central National Herbarium and also the concerned literature. When Wight and Arnott (*loc. cit.*) validated the Wallichian name *O. wightiana* as a distinct species from *O. scandens*, they tried to distinguish the former from the latter based on its lax racemes and larger flower size. But specimens belonging to both the taxa at Central National Herbarium which includes those like Wallich Catalogue no. 6774 which Wight and Arnott had examined as typical for *O. scandens* showed that the size and nature of arrangement of the flowers on the inflorescence show all degrees of variation and no taxonomic significance can be attributed to them. Similarly Talbot (*For. Fl. Bombay & Sind* 1: 257, 1909) and Gamble (*loc. cit.*) while keying out the two species used some of those varying characters like armed or unarmed nature, shape of the leaves, length of the flowers, etc. which are also not dependable characters in the separation of the two taxa.

55. ERYTHROPALACEAE

ERYTHROPALUM BL.

Erythropalum populifolium (Arn.) Mast. in Hook. f., *Fl. Brit. Ind.* 1: 579, 1875; Gamble, *Fl. Presid. Madras* 1 (1): 191, 1915, *Mackaya populifolia* Arn., *Jard. Mag. Zool. & Bot.* 2: 350, 1838.

Climbing shrubs; branches glabrous, obscurely striated. Leaves 6.5-11.5 × 5.5-9 cm, poplar-shaped, entire, glabrous, acute or shortly acuminate at apex, truncate at base; main nerves 3 at the base; petioles 3-4.5 cm long, slender. Flowers in lax axillary cymes; peduncles and pedicels filiform. Drupes 0.5-0.8 cm long, ovoid, surrounded by the remains of calyx at the tip.

Fl. & Fr. : March-April.

Courtallum (Robert Wight 877, CAL).

56. OPILIACEAE

1a. Flowers in bracteate racemes, cone-like in bud; petals free

Opilia 2

1b. Flowers in spikes, not cone-like in bud; petals united

Cansjera 1

1. *CANSJERA* JUSS. *nom. gen. cons.*

Cansjera rheedii Gmel., Syst. 1: 280. 1791; Wt., Ic. t. 1861. 1852; Mast. in Hook. f., Fl. Brit. Ind. 1: 582. 1875; Gamble, Fl. Presid. Madras 1 (1): 193. 1915; Sleum. in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b: 36. 1936. *C. scandens* Roxb., Pl. Corom. 2: t. 103. 1799. *Cherukaniram* (Malayalam).

Climbing shrubs, 3-4m high; branches yellowish pubescent. Leaves 4.5-8.5 × 1.5-2.5 cm, ovate-lanceate, thinly coriaceous, entire, glabrous, acuminate at apex, rounded or narrowed towards base; petioles up to 0.5 cm long, pubescent. Flowers in axillary short pubescent spikes. Drupes up to 1 cm long, ovoid, glabrous, orange red when ripe.

Fl. & Fr. : September-February.

Fairly common along the dry slopes and outskirts around Five falls.

2. *OPILIA* ROXB.

Opilia amentacea Roxb., Pl. Corom. 2: 31, t. 158. 1799; Wt., Ill. Ind. Bot. t. 40. 1840; Mast. in Hook. f., Fl. Brit. Ind. 1: 583. 1875; Gamble, Fl. Presid. Madras 1 (1): 192. 1915; Sleum. in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b: 38. 1936. *Ximenia olacioides* Wt. et Arn., Prodr. 89. 1834.

Woody, climbing shrubs, 3-4 m high; branches glabrous. Leaves 3-5.5 × 2-2.5 cm, ovate or ovate-lanceate, entire, glabrous, acute at apex, acute or rounded at base; petioles 0.3-0.5 cm long, stout. Flowers greenish in axillary racemes. Drupes up to 1 cm in diameter, globose.

Fl. & Fr. : February—August.

Rare, along the sides of the stream from Shembagadevi to Tiger falls.

57. SANTALACEAE

SANTALUM Linn.

Santalum album Linn., Sp. Pl. 349. 1753; Hook. f. in Hook. f., Fl. Brit. Ind. 5: 231. 1886; Gamble, Fl. Madras 2 (7): 1260. 1925; Pilg. in Engl. & Prantl, Pflanzenfam. (ed. 2) 16b: 81. 1935. *Chandanam*, *Ganatharajan* (Malayalam). *Akkam*, *Anukkam*, *Candanum* (Tamil).

Evergreen trees, 2-3 m high ; bark grey-fissured ; branches drooping. Leaves 3.5-6 × 2-3 cm, elliptic-ovate, coriaceous, glabrous, acute at both ends ; petioles \pm 1 cm long, glabrous. Flowers brownish in axillary and terminal trichotomous panicles. Drupes \pm 1 cm across, subglobose, black when ripe.

Fl. & Fr. : September - March.

Common in Tekkumalai, around Tiger falls and in other moist deciduous areas.

58. LORANTHACEAE

1a. Flowers in racemes, spikes or umbellate inflorescence

2a. Petals 5 or 6, sympetalous

3a. Inflorescence racemose or umbellate ; petals 5

4a. Inflorescence racemose

Dendrophthoe 1

4b. Inflorescence umbellate

Taxillus 7

3b. Inflorescence spicate ; petals 6

5a. Corolla without thin-walled, enlarged part at the base

Macrosolen 5

5b. Corolla at the base with a thin walled, enlarged part

Elytranthe 2

2b. Petals 4, sympetalous or choripetalous

6a. Corolla zygomorphic ; ovaries and fruits clavate and strongly attenuate towards base

Scurrula 6

6b. Corolla actinomorphic ; ovaries and fruits globose

Helixanthera 4

1b. Flowers in axillary or lateral fascicles

Helicanthes 3

1. DENDROPTHOE Mart.

Dendrophthoe falcata (Linn. f.) Etting., Denkschr. Akad. Wissen. Math. Natur. Cl. 32 : 52, 53, 58, t. 13, f. 14. 1872 ; Danser, Bull. Jard-Bot. Buitenz. 3, 16 : 30. 1938. *Loranthus falcatus* Linn. f., Suppl. 211. 1781. *L. longiflorus* Desr. in Lamk., Enc. Meth. Bot. 3 : 598. 1789 ; Wt., Ic. t. 302. 1840 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 214. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1253. 1925. *Ithilkanni*, *Itth, Utir* (Malayalam).

Semiparasitic shrubs, 30-90 cm long ; branches terete, glabrous. Leaves 10-15 × 5-8 cm, elliptic, oblong or orbicular, leathery, brittle when dry, glabrous, acute at apex, ovate or acute at base ; midrib distinct only in the lower half of the leaf ; petioles up to 1.5 cm long, stout. Flowers yellowish-green in axillary racemes at leafless nodes. Berries 0.8-1.2cm long, ovoid-oblong, pink when ripe.

Fl. & Fr. : October March.

Common, on cultivated plants like *Citrus* in Udayathan estate, on *Sterospermum personatum* (Hassk.) Chatterjee near Shembagadevi falls, on *Clausena dentata* (Willd.) Roem. on the way to Five falls and on *Ixora bracteata* Roth and *Careya arborea* Roxb. along the reserve forest boundary on the way to Old Courtallum.

2. ELYTRANTHE Bl.

Elytranthe lepidophylla (Walp.) Danser, Bull. Jard. Bot. Buitenz. 3, 10 : 317. 1929. *Loranthus lepidophyllus* Walp., Ann. 2 : 730. 1852. *L. wightii* Hook. f. in Hook f., Fl. Brit. Ind. 5 : 207. 1886 ; Gamble, Fl. Presid. Madras 2(7) : 1251. 1925. *L. arnottianus* Wt., Calcutta J. Nat. Hist. 6 : 361. 1846 (*non* Korth.).

Slender shrubs ; young branches mealy-pubescent. Leaves 2.5-4 × 0.5-2 cm, obovate, coriaceous, glabrous, ovate at apex, narrowed at base ; petioles ± 0.5 cm, long. Flowers in solitary or paired spikes shorter than the leaves.

Fl. : May.

Courtallum (*Robert Wight* 339, 1835, CAL).

3. HELICANTHES Danser

Helicantthes elastica (Desr.) Danser, Verh. K. Ned. Akad. Wet. (sect. 2), 29 (6) : 55. 1933. *Loranthus elasticus* Desr. in Lamk., Enc. Meth. Bot. 3 : 599. 1789 ; Wt. et Arn., Prodr. 386. 1834 ; Wt., Ic. t. 343. 1840 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 216. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1254. 1925. *L. euphoxbia* Wt., Ic. t. 1063. 1846.

Woody shrubs ; branches dichotomous, glabrous, swollen at nodes. Leaves sessile or subsessile, 3-7 × 2-3.5 cm, elliptic or orbicular, thickly coriaceous, entire, glaucous beneath, obtuse at apex, acute at base ; nerves obscure. Flowers sessile in axillary fascicles at nodes. Berries up to 1 cm in diameter, subglobose.

Fl. & Fr. : November.

Courtallum (*Robert Wight* 397, CAL).

4. HELIXANTHERA Lour.

- | | |
|---|------------------------|
| 1a. Flowers in spikes ; young stems, leaves and flower buds mealy-pubescent | <i>H. hookeriana</i> 1 |
| 1b. Flowers in racemes ; young stems, leaves and flower buds furfuraceous pubescent | <i>H. obtusata</i> 2 |

1. *Helixanthera hookeriana* (Wt. et Arn.) Danser, Bull. Jard. Bot. Buitenz. 3, 10 : 317. 1929. *Loranthus hookerianus* Wt. et Arn., Prodr. 381. 1834 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 207. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1251. 1925.

Woody, semiparasitic shrubs ; young branches mealy-pubescent. Leaves 5-7.5 × 1-3.5 cm, elliptic or lanceate, coriaceous, glabrous when mature, obtuse or subacute at apex, acute at base ; petioles 0.5-1 cm long, slender. Flowers greenish, sessile in axillary single or paired pubescent spikes. Berries 0.3-0.5 cm long, subglobose, with persistent calyx.

Fl. & Fr. : December-May.

Scarce, in Tekkumalai as semiparasites on the cultivated species of *Citrus*.

2. *Helixanthera obtusata* (Schult.) Danser, Bull. Jard. Bot. Buitenz. 3, 10 : 317. 1929 *Loranthus obtusatus* Schult., Syst. Veg. 7 (2) : 1650. 1880 (*non* Span.) ; Wt. et Arn., Prodr. 381. 1834 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 205. 1886 ; Gamble, Fl. Presid. Madras (2) 7 : 1251. 1925. *L. blumeanus* Wt., Calcutta J. Nat. Hist. 6 : 361. 1846.

Large shrubs. Leaves 5-11 × 2.5-6.5 cm, ovate or elliptic, coriaceous, entire or waved, glabrous, obtuse at apex, acute or obtuse at base ; petioles ± 1 cm long. Flowers in axillary racemes, shorter than the leaves. Berries ovoid, truncate at apex, tubercled.

Fl. & Fr. : August.

Courtallum (*Robert Wight* 335, 336, CAL).

5. MACROSOLEN (Bl.) Reichb.

Macrosolen parasiticus (Linn.) Danser, Blumea 2 : 36. 1935. *Lonicera parasitica* Linn., Sp. Pl. 175. 1753. *Loranthus loniceroides* Linn.,

Sp. Pl. ed. 2: 473. 1762; Wt. et Arn, Prodr. 382. 1834; Wt., Ic. t. 203. 1840; Hook. f. in Hook. f., Fl. Brit. Ind. 5: 221. 1886. *Elytranthe loniceroides* (Linn.) G. Don, Gen. Hist. 3: 427. 1834; Gamble, Fl. Presid. Madras 2 (7): 1255. *Elytranthe parasitica* (Linn.) Danser, Bull. Jard. Bot. Buitenz. 3, 10: 315. 1929.

Large shrubs; branches stout, terete or slightly angled, the internodes often twisted, glabrous. Leaves 5-12.5 × 3.5-5 cm, ovate or lanceate, coriaceous, glabrous, acuminate at apex; petioles 0.5-1 cm long. Flowers red below with greyish patches above in 2-6 flowered short axillary spikes. Berries ellipsoid, crowned by the calyx.

Fl. & Fr. : October-February.

Rare, as semiparasitic on *Terminalia* trees above Main falls.

6. *SCURRULA* Linn.

1a. Mature leaves glabrous or brownish-tomentose beneath; principal veins prominent, purplish; berries glabrous or slightly puberulent; flowers in axillary racemes

S. parasitica 2

1b. Mature leaves densely whitish tomentose, at least beneath; veins inconspicuous; berries whitish-tomentose; flowers in axillary cymes

S. cordifolia 1

1. *Scurrula cordifolia* (Wall. ex Roxb.) G. Don, Hist. 3: 421. 1834; Danser, Bull. Jard. Bot. Buitenz. 3, 10: 350. 1929. *Loranthus cordifolius* Wall. ex Roxb., Fl. Ind. 2: 222. 1824; Hook f. in Hook. f., Fl. Brit. Ind. 5: 209. 1886; Gamble, Fl. Presid. Madras 2 (7): 1252. 1925.

Large, woody semiparasitic shrub; young branches tomentose. Leaves 3.5-10 × 3-6 cm, ovate, coriaceous, tomentose on both sides or only beneath, obtuse at apex, truncate or cordate at base; petioles 1-1.5 cm long. Flowers greenish outside, pink inside, in axillary cymes, tomentose when young. Berries pyriform, white-tomentose.

Fl. & Fr. : August-January.

Very rare on the apical branches of *Dalbergia lanceolaria* Linn. f. trees at Shembagadevi.

Notes : Eventhough several authors questioned the separate specific status of *S. cordifolia* from *Scurrula parasitica* Linn., it is accepted here as two distinct species. The specific characters of the two taxa as given in the key characters here is more or less constant, justifying this concept.

2. *Scurrula parasitica* Linn., Sp. Pl. 110. 1753; Danser, Bull. Jard. Bot. Buitenz. 3, 10: 352; 1929. & ibid. 14: 34. 1938. *Loranthus scurrula*

Linn., Sp. pl. ed. 2 : 472. 1762 ; Gamble, Fl. Presid. Madras 2 (7) : 1251. 1925.

Shrubs ; young branches tomentose. Leaves 3-7.5 × 2-5 cm, broadly-elliptic, coriaceous, glabrous above, rusty-tomentose beneath, obtuse at apex, subacute at base ; petioles 0.5-1 cm long. Flowers in axillary, shortly-peduncled racemes.

Fl. : August.

Courtallum (Robert Wight 338, CAL).

7. TAXILLUS P. van Tiegh.

1a. Bracts boat-shaped, longer than the calyx ; calyx-lobes regularly toothed ; leaves, flowers and fruits tomentose or variously pubescent

T. cuneatus 2

1b. Bracts ovate, shorter than the calyx ; calyx-lobes, irregularly toothed ; leaves, flowers and fruits glabrous

T. courtallensis 1

1. *Taxillus courtallensis* (Gamble) Danser, Verh. K. Ned. Akad. Wet. (sect. 2), 29 (6) : 123. 1933. *Loranthus courtallensis* Gamble, Fl. Presid. Madras 2 (7) : 1252. 1925. *L. bracteatus* Heyne ex Roxb. var. *angustifolia* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 213. 1886.

Twiggy, semiparasitic shrubs ; young branches pubescent or tomentose. Leaves 2-3.5 × 0.5-1.3 cm, obovate, grey-lanate, rounded at apex, cuneate at base ; petioles 0.3-0.5 cm long, slender, tomentose. Flowers in axillary cymes, white-lanate ; calyx very white lanate, shortly and irregularly toothed.

Fl. : June.

Courtallum (C. A. Barber 3241, CAL).

2. *Taxillus cuneatus* (Roth) Danser, Bull. Jard. Bot. Buitenz. 3, 10 : 354. 1929. *Loranthus cuneatus* Roth, Nov. Sp. Pl. Ind. Or. 193. 1821 ; Wt. et Arn., Prodr. 385. 1834 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 214. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1253. 1925.

Bushy shrubs, forming rounded clusters ; branches greyish-brown, terete, lenticellate. Leaves 2.5-3.5 × 1-2.5 cm, ovate or obovate, subfleshy, glabrous, rounded at apex, cuneate at base. Flowers reddish-brown in axillary fascicles. Berries 0.5-1 cm long, obconic, red when ripe.

Fl. & Fr. : April-September.

Rare, in the thickly shaded Sholas of Tekkumalai at higher altitudes, as semiparasitic on *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Bedd. trees.

59. VISCACEAE

VISCUM Linn.

- 1a. Plants leafy, but older twigs sometimes with only few persistent leaves
 - 2a. Fruits ovoid, not apically truncated, dull with minute granules, not warty ; peduncles present, about 0.3 cm long *V. orientale* 3
 - 2b. Fruits oblong, apically truncated, smooth with nine longitudinal lines ; peduncles absent or if present never more than 0.1 cm long *V. monoicum* 2
- 1b. Plants leafless
 - 3a. Internodes always more than 0.3 cm wide, slightly twisted near the base, never filiform ; fruits large, ovate-oblong or globose *V. articulatum* 1
 - 3b. Internodes terete, less than 0.2 cm wide, often filiform ; fruits small, subglobose *V. ramosissimum* 4

1. *Viscum articulatum* Burm. f., Fl. Ind. 211. 1768 ; Hook. f. in Hook f., Fl. Brit. Ind. 5 : 226. 1886 (incl. var. *dichotoma*) ; Gamble, Fl. Presid. Madras 2 (7) : 1259. 1925 ; Fischer, Rec. Bot. Surv. India 11 : 161. 1926 (incl. var. *dichotoma*) ; Danser, Bull. Jard. Bot. Buitenz. 3, 16 : 56. 1938 & in Blumea 4 : 280. 1941 ; Rolla Rao, J. Indian Bot. Soc. 36 : 126. 1957. *V. flexuosum* Gamble, Kew Bull. 1913 : 47. 1913. *V. nepalense* Spreng., Syst. 47. 1827 ; Danser, Blumea 4 : 283. 1941. *V. dichotomum* D. Don, Prodr. Fl. Nep. 142. 1825 (*non* Gilbert, 1792 & *non* Spreng. 1825). *V. attenuatum* DC., Prodr. 4 : 284. 1830 ; Wt. et. Arn., Prodr. 380. 1834 ; Engl. in Engl. & Prantl, Pflanzenfam. (ed. 1) 1 : 140. 1897. *V. liguidambaricolum* Hayata, Icon. Pl. Formos. 5 : 194, t. 71, 72. 1915 ; Danser, Blumea 4 : 289. 1941.

Semiparasitic shrubs ; branches pendulous, 30-100 cm long, jointed, dichotomous ; internodes 2-5 cm long, flattened, broadening gradually from the base to the top, longitudinally striated, pale green. Leaves scaly, indistinct. Flowers greenish, minute, 1-3 together in axillary cymose clusters ; bracts connate, cupular. Berries 0.3-0.4 cm in diameter, globose or ovate-oblong, smooth, greenish-yellow.

Fl. & Fr. : February-May.

Parasitic on trees in the dry deciduous forests above Chittaruvi, on the way to Tekkumalai, on the way to Old Courtallum, etc. where it is most abundant.

2. *Viscum monoicum* Roxb. ex DC., Prodr. 4 : 278. 1830 ; Roxb., Fl. Ind. 3 : 763. 1832 ; Wt. et Arn., Prodr. 379. 1834 ; Roxb., Fl. Ind. (ed. 3) : 715. 1874 ; Hook. f. in Hook. f. Fl. Brit. Ind. 5 : 224. 1886 (incl. var. *edgeworthii*) ; Gamble, Fl. Presid. Madras 2(7) : 1258. 1925 ; Danser, Bull. Jard. Bot. Buitenz. 3, 16 : 54. 1938 (as syn. of *V. orientale*) & in Blumea 4 : 305. 1941 (excl. syn. *verruculosum*) ; Rolla Rao, J. Indian Bot. Soc. 36 : 1960. 1957. *V. benghalensis* Roxb. ex Wt. et Arn., Prodr. 379. 1834 (as synonym). *V. orientale* Talbot, For. Fl. Bombay & Sind. 2 : 421. 1911 (*non* Willd. *pro parte*).

Much branched, pendulous shrubs, up to 40 cm long ; branches jointed, terete ; internodes 2-7 cm long, up to 0.8 cm in diameter, longitudinally wrinkled, yellowish. Leaves up to 7×3 cm, ovate or lanceate, somewhat leathery, entire, more or less irregularly crenate or wavy, acute or subacute at apex, tapering into the petiole at base ; basal nerves 3 or 5, fairly prominent. Flowers greenish-yellow, sessile in axillary cymes of 3-5 ; bracts connate, cupular, scaly. Berries 0.4-0.5 cm long, oblong, truncate at apex, smooth with about nine longitudinal whitish lines.

Fl. & Fr. : February - May.

Fairly common around Main falls and between Tiger falls and Shembagadevi.

3. *Viscum orientale* Willd., Sp. Pl. 4 (2) : 717. 1805 ; Wt. et Arn., Prodr. 379. 1834 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 224. 1886 (*pro parte*) ; Gamble, Fl. Presid. Madras 2 (7) : 1258. 1925 ; Danser, Bull. Jard. Bot. Buitenz. 3, 16 : 53. 1938 (excl. syn. *V. monoicum* Roxb. ex Wt. et Arn.) & in Blumea 4 : 299. 1941 ; Rolla Rao, J. Indian Bot. Soc. 36 : 154. 1957.

Much branched, pendulous shrubs, up to 60 cm long ; branches dichotamous or umbellate towards apex, terete, jointed ; nodes swollen ; internodes up to 6 cm long, \pm 0.5 cm in diameter, smooth or rarely striped. Leaves 2.5—5×1—2.2 cm, elliptic or elliptic-lanceate, entire, obtuse at apex, tapering into the petiole at base ; basal nerves 3, more distinct above. Flowers greenish yellow in axillary sessile or pedunculate clusters of 3 ; bracts connate at base, boat shaped. Berries \pm 0.5 cm long, ovoid, contracted at apex, surface dull by minute granules, smooth, not warty.

Fl. & Fr. : January May.

Common in the dry deciduous forests between Tiger falls and Shembagadevi on trees like *Pongamia pinnata* (Linn.) Pierre and *Zizyphus xylopyrus* (Retz.) Willd.

Notes : Each inflorescence unit appears to be quite uniform in this plant and consists of one larger flower in the centre which is female and two lateral male flowers which are smaller than the central one. Danser (*loc. cit.* 1941) had given that 3-5 flowers are present in each inflorescence unit in this taxon and this may be due to his inclusion of *V. monoi-cum* also as a synonym there.

4. *Viscum ramosissimum* Wt. et Arn., Prodr. 380. 1834 ; Wt., Ic. t. 3 : 13. 1845 (excl. t. 1017) ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 225. 1886 ; Gamble, Fl. Presid. Madras 2 (7) : 1258. 1925 ; Danser, Blumea 4 : 294. 1941 ; Rolla Rao, J. Indian Bot. Soc. 36 : 142. 1957.

Much branched shrubs, 15-25 cm long ; branches numerous, broom-like, jointed, terete ; internodes 3-5 cm long, terete, up to 0.2 cm in diameter, smooth. Flowers minute, sessile in 1-3 flowered groups whorled at the nodes ; bracts connate at base. Berries \pm 0.3 cm in diameter, subglobose.

Notes : The specimen Robert Wight 340 from Courtallum examined here is devoid of any leaves, but possess fruits of half-maturation. The details of the fruits are given along with the description of the species which Danser (*loc. cit.*) and Rolla Rao (*loc. cit.*) failed to observe for the taxon.

60. HIPPOCRATEACEAE

1a. Flowers in axillary groups of mostly threes ;
fruits not winged

Salacta 2

1b. Flowers in axillary corymbose cymes ; fruits winged

Reissantia 1

1. REISSANTIA Halle

Reissantia indica (Willd.) Halle, Bull. Mus. Hist. Nat. Paris 30 : 466. 1958 ; Raju, J. Biol. Sci. 8 (2) : 57. 1965. *Hippocratea indica* Willd., Sp. Pl. 1 : 143. 1797 ; Wt. et Arn., Prodr. 104. 1834 ; A. Laws. in Hook. f., Fl. Brit. Ind. 1 : 624. 1875 ; Gamble, Fl. Presid. Madras 1 (2) : 213. 1918. *Pristimera indica* (Willd.) A. Sm., J. Arnold Arbor. 26 : 175. 1945. *Odangod* (Tamil).

Climbing shrubs ; branchlets glabrous. Leaves $2.5-9.5 \times 2-4.5$ cm, elliptic, finely serrate, pale, acuminate at apex, narrowed at base ; petioles 0.5—1.5 cm long. Flowers minute in axillary corymbose cymes shorter than the leaves. Samaras 3—4 cm long, narrowly acute, 3 winged.

Fl. : May.

Courtallum (*Robert Wight* 193, CAL).

2. SALACIA Linn. *nom. gen. cons.*

Salacia oblonga Wall. (Cat. no. 4226. 1831. *nom. nud.*) *ex* Wt. *et* Arn., Prodr. 106. 1834 ; Wt., Ill. Ind. Bot. t. 40. 1840 ; A. Laws. in Hook. f., Fl. Brit. Ind. 1 : 628. 1875 ; Gamble, Fl. Presid. Madras 1 (2) : 215. 1918 ; Raju, J. Biol. Sci. 8 (2) : 58. 1965.

Climbing shrubs, 3—4 cm high ; branches glabrous. Leaves $5.5-15 \times 2.5-6$ cm, elliptic oblong, entire, yellowish when dry, obtusely acuminate or rounded at apex, tapering at base ; petioles 1—1.5 cm long, slender. Flowers yellowish green in groups of 3, axillary, sessile or pedicelled. Berries up to 4 cm in diameter, globose pyriform, orange coloured when ripe ; seeds 1—8, angular, immersed in the pulp.

Fl. & Fr. : December.

Fairly common below Honey falls.

61. CELASTRACEAE

- | | |
|--|-----------------------|
| 1a. Armed shrubs | <i>Maytenus</i> 3 |
| 1b. Unarmed shrubs or trees | |
| 2a. Climbing shrubs ; fruits dehiscent | <i>Celastrus</i> 2 |
| 2b. Erect shrubs or trees ; fruits indehiscent | |
| 3a. Leaves entire ; stigma one, broad, peltate | <i>Pleurostylia</i> 4 |
| 3b. Leaves serrate ; stigma three, capitate or spreading | <i>Cassine</i> 1 |

1. CASSINE Linn.

Cassine glauca (Rottb.) O. Ktze., Rev. Gen. Pl. 1 : 114. 1891. *Mangifera glauca* Rottb., Nye. Sam. Vid. Selsk. Skrift. 2 : 534, t. 4, f. 1. 1753. *Elaeodendron glaucum* (Vahl) Pers., Syn. 1 : 241. 1805 ; A. Laws.

in Hook. f., Fl. Brit. Ind. 1 : 623. 1875 ; Gamble, Fl. Presid. Madras 1 (2) : 211. 1918. *E. roxburghii* Wt. et Arn., Prodr. 157. 1834 ; Wt., Ill. Ind. Bot. t. 71. 1840. *Karuniraka* (Malayalam). *Celuppai*, *Irogoti*, *Karukkuva*, *Karuvalli* (Tamil).

Trees, 6–8 m high ; bark grey. Leaves 6–10 × 3–4.5 cm, elliptic or obovate, serrate, glabrous, rounded or acute at apex, acute at base ; petioles 2–2.5 cm long. Flowers greenish in axillary dichotomous or paniculate cymes. Drupes 1–1.5 cm long, obovoid, apiculate ; seeds arillate.

Fl. & Fr. : May–January.

Along the sides of Main falls this is one of the common evergreen trees.

2. CELASTRUS Linn.

Celastrus paniculata Willd., Sp. Pl. 1 : 1125. 1797 ; Wt. et Arn., Prodr. 158. 1834 ; Wt., Ic. t. 158. 1840 & Ill. Ind. Bot. 72. 1840 ; A. Laws. in Hook. f., Fl. Brit. Ind. 1 : 617. 1875 ; Gamble, Fl. Presid. Madras 1 (2) : 208. 1918. *Palulavam* (Malayalam). *Valuluvai*, *Kalamban* (Tamil).

Scandent shrubs, up to 5 m high ; young branches pendulous with lenticular warts. Leaves 4–9 × 2–4.5 cm, broadly elliptic or ovate, glabrous, serrate or closely crenate, shortly acute at apex, rounded or acute at base ; petioles 0.3–0.5 cm long. Flowers greenish–yellow at the tip, dark brown below, in small terminal, pendulous panicles. Capsules 0.5–1 cm across, subglobose, transversely wrinkled, 3-valved ; seeds with fleshy scarlet aril.

Fl. & Fr. : April–October.

Common in the dry outskirts between Tiger falls and Main falls and also around Five falls.

3. MAYTENUS Molina emend. Bose

Maytenus wallichii (G. Don) Bennet et Sahnj, Indian For. 103 : 387. 1917. *Catha wallichii* G. Don, Gen. Syst. 2 : 9. 1832. *Celastrus wallichiana* Spreng. ex Wt. et Arn., Prodr. 159. 1834. *Gymnosporia wallichiana* A. Laws. in Hook. f., Fl. Brit. Ind. 1 : 621. 1834 ; Gamble, Fl. Presid. Madras 1 (2) : 210. 1918. *Maytenus wallichiana* (Wt. et Arn.) Raju et Babu, Bull. Bot. Surv. India 10 : 349. 1969.

Armed shrubs, 2-3 m high ; branches zig - zag ; thorns with flowers and leaves. Leaves $2.5 \times 2.5-4$ cm, obovate, obtuse or emarginate, leathery, serrate, glabrous, rounded at apex, cuneate at base ; petioles 0.5-1 cm long. Flowers greenish yellow or white in terminal cymose fascicles or on thorns. Capsules 1-2 cm long, slightly obcordate, brown ; seeds arillate.

Fl. & Fr. : December - March.

Fairly common in the outskirts and open areas around Tiger falls and Main falls.

4. PLEUROSTYLIA Wt. et Arn.

Pleurostylia opposita (Wall.) Alston in Trimen, Handb. Fl. Ceylon 6 (suppl.) : 48. 1931. *Celastrus oppositus* Wall. in Roxb., Fl. Ind. 2 : 398. 1824. *Pleurostylia wightii* Wt. et Arn., Prodr. 157. 1834 ; Wt., Ic. t. 155. 1839 ; A. Laws. in Hook. f., Fl. Brit. Ind. 1 : 617. 1875 ; Gamble, Fl. Presid. Madras 1 (2) : 211. 1918. *P. heynei* Wt. et Arn., Prodr. 157. 1834. *Chirupiyari* (Tamil).

Small glabrous trees ; bark pale. Leaves $2.5-7.5 \times 1-3.2$ cm, elliptic-oblong or somewhat obovate, entire, glabrous, pale, obtuse at apex, acute at base ; secondary nerves obscure ; petioles 0.3-0.6 cm long, slender. Flowers small in axillary paniculate cymes. Drupes 0.5-0.7 cm long, ovoid with persistent calyx ; seeds with aril-like testa.

Fl. & Fr. : April - September.

Courtallum (C. A. Barber 3309, CAL).

62. ICACINACEAE

1a. Flowers unisexual (or functionally so, i.e. the plant dioecious) ; inflorescence axillary

Gomphandra 1

1b. Flowers bisexual ; inflorescence terminal

Nothapodytes 2

1. GOMPHANDRA Wall. ex Roxb.

Gomphandra tetrandra (Wall. ex Roxb.) Sleum., Natizbl. 15 : 238. 1940 & in Blumea 17 : 205. 1969. *Lasianthera* ? *tetrandra* Wall. ex Roxb., Fl. Ind. 2 : 328. 1834. *Gomphandra axillaris* Wall. (Cat. no. 3718. 1831 *nom. nud.*) ex Voight, Hort. Suburb. Calc. 31. 1845 *nom. illeg.*

(based on *L. tetrandra* Wall.) ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 586. 1875. *G. polymorpha* Wt., Ill. Ind. Bot. 1 : 103. 1840, incl. vars. *angustifolia*, *longifolia*, *acuminata*, *oblongifolia* and *ovalifolia* Wt. loc. cit. ; Gamble, Fl. Presid. Madras 1 (1) : 195. 1915. *Stemmurus heyneanus* Miers, Ann. Mag. Nat. Hist. 2, 10 : 40. 1852. *S. axillaris* Miers, Ann. Mag. Nat. Hist. 2, 10 : 41. 1852 ; Howard, J. Arnold Arbor. 2 : 486, pl. 1, f. 7 10. 1940. *Cundali* (Tamil).

Erect, woody shrubs, 1-2.5 m high ; stem feebly branched, glabrous, green. Leaves 8-14.5 × 2.5-4 cm, lanceate, entire, glabrous, acute or shortly and bluntly acuminate at apex, acute or obtuse at base ; petioles 0.4 to 0.6 cm long. Flowers yellowish in short axillary cymes. Drupes 1-1.5 cm long, elongate, topped with the remains of the stigma.

Fl. & Fr. : August-February.

Very rare, along the steep slopes towards the base of Kailasamottai, in thickly shaded areas.

2. NOTHAPODYTES BL.

Nothapodytes foetida (Wt.) Sleum., Notizbl. 15 : 247. 1940 ; Harward, J. Arnold Arbor. 23 : 70. 1942 ; Sleum., Blumea 17 : 232. 1969. *Stemonurus foetidus* Wt., Ic. t. 955. 1845. *Mappia foetida* (Wt.) Miers, Ann. Mag. Nat. Hist. 2, 9 : 395. 1852 incl. vars. *gardneriana* (Miers) Thw. & *championiana* (Miers) Thw. ; Mast. in Hook. f., Fl. Brit. Ind. 1 : 589. 1875 ; Gamble, Fl. Presid. Madras 1 (1) : 196. 1915. *M. gardneriana* Miers, Ann. Mag. Nat. Hist. 2, 9 : 396. 1852 ; Mast. loc. cit. ; Gamble, loc. cit. *M. ovata* Miers, Ann. Mag. Nat. Hist. 2, 9 : 396. 1852 ; Mast., loc. cit. (incl. var. *championiana* Miers). *M. championiana* Miers, Ann. Mag. Nat. Hist. 2, 9 : 397. 1852 ; Gamble, loc. cit. *M. tomentosa* Miers, Ann. Mag. Nat. Hist. 2, 9 : 397. 1852 ; Mast., loc. cit. ; Gamble, loc. cit. *Corilai*, *Pillipicum* (Malayalam). *Arali*, *Cheubugam*, *Corilai* (Tamil).

Trees ; branchlets angular with leaf-scars. Leaves 4-18 × 2-8 cm, elliptic-ovate or lanceate-oblong, entire, sparsely pubescent above, glabrous or sparsely pilose on the veins beneath, attenuate at apex, attenuate or rounded at base ; petioles 1.5-5 cm long, strigose. Flowers small in terminal, dichotomous, corymbose cymes.

Fl. : August.

Courtallum (Robert Wight 744, 1077, CAL).

63. BUXACEAE

SARCOCOCCA Lindl.

Sarcococca pruniformis Lindl., Bot. Reg. t. 1012. 1826 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 266. 1888 (*pro parte*, excl. vars.). *S. trinervia* Wt., Ic. t. 1877. 1852 ; Gamble, Fl. Presid. Madras 2 (7) : 1265. 1925.

Shrubs with green branches. Leaves 7-12 × 2-3.5 cm, elliptic or elliptic-lanceate, entire, glabrous, drying brown, long acuminate at apex, triple-nerved from 0.5-1 cm above the base ; petioles 0.5-1 cm long. Flowers in short axillary racemes, unisexual, apetalous. Berries ellipsoid, 0.5-1 cm long, fleshy.

Fl. & Fr. : April - June.

Courtallum (*Robert Wight* 806, 1082, CAL).

64. EUPHORBIACEAE

- | | |
|---|-----------------------|
| 1a. Plants with stinging hairs | <i>Tragia</i> 23 |
| 1b. Plants without stinging hairs | |
| 2a. Leaves palmately 3 to 5 lobed | <i>Jatropha</i> 14 |
| 2b. Leaves not lobed | |
| 3a. Leaves peltate | <i>Macaranga</i> 16 |
| 3b. Leaves not peltate | |
| 4a. Flowers in cyathia, i.e. reduced to a single stamen enclosed in an involucre with a single, central female flower, the whole resembling a single flower | |
| 5a. Involucres irregular, slipper-shaped | <i>Pedilanthus</i> 19 |
| 5b. Involucres regular, turbinate or campanulate | <i>Euphorbia</i> 10 |
| 4b. Flowers not in cyathia i.e. not reduced to a single stamen or a single ovary contained in an involucre | |
| 6a. Flowers with petals in one or both the sexes | |
| 7a. Petals free | |
| 8a. Calyx in female flowers not accrescent in fruits | |
| 9a. Stamens with filaments free or nearly so | |

- 10a. Calyx in male flowers imbricate, valvate or nearly open ; pistillode absent *Croton* 7
- 10b. Calyx in male flowers globose, splitting into 4 to 5 valvate lobes ; pistillode present *Agrostistachys* 2
- 9b. Stamens produced on a gynophore or connate at least at the base into a column
- 11a. Ovary 2-loculed ; fruits drupaceous with 1 or 2 pyrenes ; styles 2, forked or subentire *Bridelia* 5
- 11b. Ovary 3-loculed ; fruits capsular with 3 valves ; styles 3, each bifid *Chrozophora* 6
- 8b. Calyx in female flowers persistent and accrescent in fruits *Blachia* 3
- 7b. Petals connate *Givoria* 12
- 6b. Flowers without petals in both the sexes

- 12a. Fruits capsular or drupaceous (except in *P. emblica* where it is a berry)
- 13a. Stamens connate by their connectives into a column
- 14a. Styles confluent into a long or short column lobed at the tip *Glochidion* 13
- 14b. Styles free or if partly connate style arms and stigma free *Sauropus* 21
- 13b. Stamens free or if connate, by their filaments only
- 15a. Stamens few to many, but always more than five
- 16a. Fruits capsular
- 17a. Leaves crenate or crenateserrate; stamens often eight *Acalypha* 1
- 17b. Leaves distantly denticulate, sinuate or entire; stamens 20-30 or more *Mallotus* 17
- 16b. Fruits drupes *Drypetes* 8
- 15b. Stamens 3 to 5
- 18a. Calyx-lobes 5 or 3 in both male and female flowers; stamens 5 or 3
- 19a. Stamens 5 *Meinckia* 18
- 19b. Stamens 3
- 20a. Leaves large, lanceate or oblanceate *Excoecaria* 11
- 20b. Leaves very small, oblong *Phyllanthus* 20
- 18b. Calyx-lobes 4 in male and 6 in female flowers; stamens 2 or 4 *Eriococcus* 9
- 12b. Fruits berries
- 21a. Stamens all free and exerted *Securinega* 22
- 21b. Stamens all connate or at least the inner series of 2 or 3 connate into a column

- 22a. Stamens 3, connate into a column *Breynia* 4
- 22b. Stamens 5 in two series, the outer with free filaments, the inner 2 or 3 connate into a column *Kirganella* 15

1. ACALYPHA Linn.

- 1a. Erect herbs, 30-60 cm high *A. indica* 2
- 1b. Shrubs, 1-2 m high
- 2a. Stem and leaves aromatic ; male and female flowers on the same inflorescence *A. fruticosa* 1
- 2b. Stem and leaves not aromatic ; male and female flowers on separate inflorescence *A. racemosa* 3

1. *Acalypha fruticosa* Forssk., Fl. Aegypt. - Arab. 161. 1775 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 415. 1887 ; Pax et K. Hoffm. in Engl., Pflanzenr. 85 : 169. 1924 ; Gamble, Fl. Presid. Madras 2 (7) : 1330. 1925. *Cini* (Tamil).

Much branched aromatic shrubs ; branchlets pubescent. Leaves 2.5 7.5 × 1 4.5 cm, ovate, crenate, glabrous above, glandular beneath, obtusely acuminate at apex, cuneate at base ; petioles 2 3 cm long, slender, pubescent. Flowers in axillary spikes with few female flowers towards the base and male flowers above. Capsules trilobed with yellowish glands in the sinus, tomentose.

Fl. & Fr. : December - August.

Common in the dry outskirts around Main falls.

2. *Acalypha indica* Linn., Sp. Pl. 1003. 1753 ; Wt., Ic. t. 877. 1844 - 45 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 416. 1887 ; Pax et K. Hoffm. in Engl., Pflanzenr. 85 : 33. 1924 ; Gamble, Fl. Presid. Madras 2 (7) : 1330. 1925 ; Airy Shaw, Kew Bull. 26 : 206. 1971.

Erect herbs, 30 60 cm high ; branches angular, pubescent. Leaves 2.5 7.5 × 1.5 4.5 cm, ovate or rhomboid ovate, crenate serrate, thin, acute at apex, cuneate at base ; petioles slender. Flowers greenish in axillary spikes ; male and female flowers on the same inflorescence. Capsules small, hirsute, concealed by the persistent bracts.

Fl. & Fr. : September - December.

A common weed in the wet and shady localities around Main falls.

3. *Acalypha racemosa* Wail. (Cat. no. 1828. 1829. *nom. nud.*) ex Baill., *Etud. Gen. Euphorb.* 443. 1858 ; Sant. et Wagh, *Bull. Bot. Surv. India* 5 : 105. 1963. *A. paniculata* Miq., *Fl. Ind. Bat.* 1, 2 : 406. 1859 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 415. 1887 ; Pax et K. Hoffm. in Engl., *Pflanzenr.* 85 : 14. 1924 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1330. 1925.

Shrubs, \pm 1 m high ; branches finely pubescent. Leaves 4 \times 10 \times 1.5 \times 5 cm, ovate, membranous, serrate, sparsely hairy on both sides, acuminate at apex, rounded or subcordate at base ; petioles 2 \times 7.5 cm long, pubescent. Flowers unisexual ; female flowers in lax terminal panicles with minute bracts ; male flowers in slender axillary spikes. Capsules \pm 0.2 cm across, trilobed.

Fl. & Fr. : January - August.

Common at Chittaruvi, Tiger falls and Shembagadevi.

2. AGROSTISTACHYS Dalz.

1a. Leaves coarsely and sharply serrate with incurved spinulose teeth

A. indica 1

1b. Leaves entire

A. meeboldii 2

1. *Agrostistachys indica* Dalz., *Kew J. Bot.* 2 : 41. 1840 ; Bedd., *lc. Pl. Ind. Or.* t. 241. 1874 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 406. 1887 ; Pax et K. Hoffm. in Engl., *Pflanzenr.* 57 : 103. 1912 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1317. 1925 ; Balak., *J. Bombay Nat. Hist. Soc.* 67 : 301-303. 1970 ; Airy Shaw, *Kew Bull.* 29 : 312. 1974. *A. longifolia* (Wt.) Benth. var. *genuina* Muell. Arg. in DC., *Prodr.* 15 (2) : 726. 1866. *A. gauchandii sensu* Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 406. 1887 (*non* Muell. Arg., 1866).

Stout glabrous shrubs, 1 \times 2 m high ; branches tough, marked with scars of fallen petioles and stipules. Leaves 12 \times 48 \times 4 \times 15 cm, elliptic-oblong or oblong-lanceate, spathulate, coarsely and sharply serrate with incurved spinulose teeth, acuminate or bluntly cordate at apex, narrowed or cuneate at base. Flowers greenish, monocious in axillary or supra axillary spikes shorter than the leaves. Capsules \pm 1 cm across, 3 lobed, glabrous, reddish-brown.

Fl. & Fr. : August February.

Common in Tekkumalai and Vaithamalai, in deeply shaded areas.

2. *Agrostistachys meeboldii* Pax et K. Hoffm. in Engl., Pflanzenr. 57 : 100. 1912 ; Gamble, Fl. Presid. Madras 2 (7) : 1318. 1925 ; Balak., J. Bombay Nat. Hist. Soc. 67 : 303-304. 1970. *Sarcoclinum longifolium* Wt., Ic. t. 5 : 24, t. 1887-1888. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 407. 1887 excl. var. *malayana* et var. *latifolia* (non Kurz).

Large shrubs or small trees ; branches glabrous. Leaves 14-30 × 3-9 cm, oblanceate, spatulate, leathery, entire, shortly and obtusely acuminate at apex, narrowed and gradually tapering into the petiole at base ; petioles 0.5-1.5 cm long, broad at base. Flowers unisexual in solitary and axillary spikes shorter than the leaves. Capsules 0.6-0.8 cm long, depressed globose, minutely pilose or subglabrous.

Fl. & Fr. : August February.

Courtallum (Robert Wight 2612, CAL).

3. *BLACHIA* Baill.

- 1a. Male flowers in umbels ; persistent calyx \pm 0.3 cm long

B. umbellata 2

- 1b. Male flowers in short racemes ; persistent calyx 1-1.5 cm long

B. calycina 1

1. *Blachia calycina* Benth., J. Linn. Soc. Lond. 17 : 226. 1879 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 402. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1338. 1925 ; Pax et K. Hoffm. in Engl. & Prantl, Pflanzenfam. 19C : 160. 1931. *Croton umbellatum* Wt., Ic. t. 1874. 1852 (non Willd.).

Spreading shrubs, 1-2.5 m high ; branches glabrous. Leaves 4.5-9.5 × 1.5-4 cm, lanceate or oblanceate, subequal sided, entire, glabrous, bluntly acuminate at apex, narrowed at base ; petioles up to 0.5 cm long. Flowers greenish yellow, monoecious ; male flowers in lax, terminal racemes ; female flowers solitary, axillary. Capsules \pm 1 cm long, with accrescent calyx about 1.5 cm long.

Fl. & Fr. : Almost throughout the year.

Very common above Chittaruvu, below New falls and in other dry areas.

2. *Blachia umbellata* (Willd.) Baill., Etud. Gen. Euphorb. 387, t. 19, f. 18-20. 1858; Hook. f. in Hook. f., Fl. Brit. Ind. 5: 402. 1887; Gamble, Fl. Presid. Madras 2 (7): 1338. 1925; Pax et K. Hoffm. in Engl. & Prantl, Pflanzenfam. (ed. 2) 19C: 160. 1931. *Croton umbellatum* Willd., Sp. Pl. 4: 545. 1805.

Shrubs up to 1.5 m high; branches glabrous. Leaves 2.5 - 10 × 1.5 - 5 cm, ovate or obovate, entire, glabrous, bluntly acuminate at apex, acute at base; petioles 0.5 - 0.7 cm long. Flowers greenish, monoecious; male flowers in terminal long peduncled umbels; female flowers terminal in groups of 1-5 on erect peduncles. Capsules 0.5 - 1 cm long, deeply 3-lobed, smooth; persistent calyx 0.2 - 0.3 cm long.

Fl. & Fr.: January - August.

Rare, in the dry outskirts at Old Courtallum.

4. BREYNIA Forst. et Forst. f. non. gen. cons.

1a. Calyx of the female flowers enlarged in fruits *B. retusa* 1

1b. Calyx of the female flowers slightly enlarged or not enlarged in fruits *B. rhamnoides* 2

1. *Breynia retusa* (Dennst.) Alston in Trimen, Handb. Fl. Ceylon 6 (suppl.): 261. 1931. *Phyllanthus retusus* Dennst., Schluessel zum Hort. Malab. 24. 1818. *Melanthesa retusa* (Dennst.) Kost., Allg. Med. - Pharm. Flora 5: 1771. 1835; Sant., Bull. Bot. Surv. India 3: 19. 1961. *M. turbinata* Wt., Ic. t. 1897. 1852. *Breynia patens* Rolfe, J. Bot. (n. s.) 11: 359. 1882; Hook. f. in Hook. f., Fl. Brit. Ind. 5: 329. 1887; Gamble, Fl. Presid. Madras 2 (7): 1304. 1925. *Peruniruri* (Malayalam).

Shrubs, 1.5 - 2 m high; branches spreading. Leaves 1.5 - 2.5 × 0.5 - 1.5 cm, broadly - elliptic, glabrous, greenish above, glaucous beneath, obtuse at apex, rounded or narrowed at base. Flowers yellowish - green, axillary; male flowers often in small fascicles; female flowers solitary. Berries 1 - 1.5 cm across, depressed globose, orange - coloured turning purplish black.

Fl. & Fr.: May - June.

Rare, in the outskirts and dry areas around Main falls.

2. *Breynia rhamnoides* (Retz.) Muell. - Arg. in DC., Prodr. 15 (2): 440. 1866; Hook. f. in Hook. f., Fl. Brit. Ind. 5: 330. 1887; Gamble,

Fl. Presid. Madras 2 (7) : 1304. 1925. *Phyllanthus rhamnoides* Retz., Obs. Bot. 5 : 30. 1789. *Melanthesa rhamnoides* (Retz.) Wt., Ic. t. 1898, f. 1. 1852. *Chuvannaniruri*, *Kattuneruri*, *Pavilappulu* (Malayalam). *Kattuneruri*, *Pomarai* (Tamil).

Shrubs, 2–2.5 m high; branches spreading, glabrous. Leaves shortly petioled. 1.5–3 × 1–1.5 cm, elliptic, ovate or rounded, membranous, entire, glabrous, obtuse at both ends. Flowers yellowish, axillary, pedicelled. Berries up to 0.7 cm long, subglobose, yellowish red when ripe.

Fl. & Fr. : April–August.

Rare, in the dry outskirts of Old Courtallum and Chittaruvu.

5. *BRIDELIA* Willd.

- | | |
|--|------------------------|
| 1a. Flowers pubescent outside, glabrous inside | <i>B. scandens</i> 1 |
| 1b. Flowers glabrous outside, pubescent inside | <i>B. stipularis</i> 2 |

1. *Bridelia scandens* (Roxb.) Willd., Sp. Pl. 4 : 979. 1805 (*pro parte*); Jablonszky in Engl., Pflanzenr. 65 : 54. 1915; Gamble, Fl. Presid. Madras 2 (7) : 1281. 1925. *Cluytia scandens* Roxb., Pl. Corom. 4 : 39, t. 173. 1798. *Bridelia stipularis* Muell.—Arg. in DC., Prodr. 15 : 499. 1866 (*promin. parte*); Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 270. 1887 (*ex parte*).

Armed lianas, reaching 3–4 m high; branches yellowish tomentose. Leaves 5–12.5 × 1–5 cm, elliptic or ovate, subcoriaceous, entire, pubescent beneath, obtuse, acute or rounded at base; petioles 0.5–1 cm long, stout, tomentose. Flowers yellowish, monoecious in axillary and terminal spikes. Drupes ± 1 cm long, oblong, ridged.

Fl. & Fr. : June–March.

Common in the dry outskirts around Tiger falls.

2. *Bridelia stipularis* (Linn.) Bl., Bijdr. 2 : 597. 1825; Muell. Arg. in DC., Prodr. 15 (2) : 499. 1866 (*pro parte*); Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 270. 1887; Jablonszky in Engl., Pflanzenr. 65 : 56. 1915; Gamble, Fl. Presid. Madras 2 (7) : 1280. 1925. *Cluytia stipularis* Linn., Mant. 127. 1767.

Straggling shrubs, 3–6 m high; branches yellowish tomentose. Leaves 4.5–10.5 × 1.5–4.5 cm, elliptic-ovate or obovate, entire,

fulvous tomentose beneath, acute at apex, rounded at base ; petioles ± 0.5 cm long, tomentose. Flowers in axillary or terminal spikes with small leaves. Drupes ± 0.8 cm long, oblong with enlarged calyx.

Fl. & Fr. : June - March.

Banks of the stream in Udayathan estate above Swamiar falls.

6. *CHROZOPHORA* Neck. ex Juss. nom. gen. cons.

Chrozophora rottleri (Geiseler) Juss. ex Spreng., Syst. Veg. 3 : 850. 1826 ; Prain, Kew Bull. 1918 : 95. 1918 ; Pax et K. Hoffm. in Engl., Pflanzent. 57 : 19. 1912 ; Gamble, Fl. Presid. Madras 2 (7) : 1317. 1925 ; Balak., Bull. Bot. Surv. India 15 : 4. 1973. *Croton rottleri* Geiseler, Crot. Monogr. 57. 1807. *C. plicata* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 409. 1887.

Feebly branched shrubs ; branches glabrous. Leaves $4.5 - 7.5 \times 2.3 - 4$ cm, variable in shape, ovate to suborbicular, succulent, hairy on both sides, obtuse or rounded at apex, cuneate at base ; petioles $2 - 3.8$ cm long, hairy. Flowers minute in axillary cymes. Capsules ± 1 cm across, reddish, densely tomentose.

Fl. & Fr. : February - April.

Courtallum (Robert Wight 2932, CAL).

7. *CROTON* Linn.

- | | |
|--|---------------------------|
| 1a. Branches silvery scaly ; leaves entire | <i>C. malabaricus</i> 3 |
| 1b. Branches stellate-hairy or with trichomes ; leaves serrate | |
| 2a. Shrubs or small trees ; flowers in long, lax, terminal racemes | <i>C. klotzchianus</i> 2 |
| 2b. Herbs ; flowers in short terminal spikes | <i>C. bonplandianum</i> 1 |

1. *Croton bonplandianum* Baill., Adansonia 4 : 339. 1864 ; Croisat, J. Bombay Nat. Hist. Soc. 41. 573. 1940. *C. sparsiflorus* Morong in Ann. N.Y. Acad. Sci. 7 : 221. 1893 ; Gamble, Fl. Presid. Madras 2 (7) : 1316. 1925.

Erect herbs, $30 - 60$ cm high ; stem with multi armed trichomes. Leaves $2 - 6 \times 1.5 - 2.5$ cm, ovate - lanceate, serrate, acuminate at apex, ovate at base ; petioles $1.5 - 3.5$ cm long. Flowers greenish white in

terminal spikes ; male flowers towards the apex of the inflorescence ; female flowers towards the base of it. Capsules 3 angled, stellate hairy.

Fl. & Fr. : September January.

A weed of recent introduction in India (1910), common in the waste places and plains.

2. *Croton klotzschianus* (Wt.) Thw., Enum., Pl. Zeyl. 276. 1864 Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 392. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1315. 1925. *Tigllium klotzschianus* Wt., Ic. t. 1914. 1852. *Tani* (Tamil).

Shrubs or small trees, 1-4 m high ; young branches stellate hairy. Leaves 2.5-9.5 × 2.5-4.5 cm, elliptic-ovate or oblong, serrate, acute at apex, rounded at base ; petioles 1-2.5 cm long, slender. Flowers greenish-yellow, unisexual on long slender racemes. Capsules 1-1.5 cm long, oblong, stellate hairy.

Fl. & Fr. : October June.

Common in the lower altitudes of the area like Chittaruvu.

3. *Croton malabaricus* Bedd., Ic. Pl. Ind. Or. t. 181. 1872 & in For. Man. in Fl. Sylvat. 204. 1874 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 386. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1314. 1925. *Koluvasi*, *Anakkuru*, *Pimparam* (Malayalam). *Tavuttippolavu*, *Anakkutu* (Tamil).

Trees, 5-8 m high ; branchlets silvery-scaly. Leaves 4.5-16.5 × 2.5-9.5 cm, elliptic or rarely lanceate, entire, sparsely and stellately lepidote above, silky-scaly beneath, acuminate at apex, cuneate at base ; petioles up to 8.5 cm long, slender, silky-scaly. Flowers in terminal racemes. Capsules up to 1.5 cm long, obovoid, silky-scaly.

Fl. & Fr. : July September.

Courtallum (Robert Wight 802, CAL).

8. DRYPETES Vahl

Drypetes oblongifolia (Bedd.) Airy Shaw, Kew Bull. 23 : 57. 1969. *Laneasagum oblongifolium* Bedd., Madras J. Sci. (n. s.) 6 : 71. 1861. *Cyclostemon macrophyllus* Bl. var. *sessiliflora* Bedd., Fl. Sylvat. 2 : 278, t. 278. 1872. *C. macrophyllus* Bl. var. *peninsularis* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 341. 1887. *Cyclostemon macrophyllus sensu* Bourd.,

Trav. Trees 329. 1908 ; Gamble, Fl. Presid. Madras 2 (7) : 1302. 1925 (*non* Bl.) ; *Drypetes longifolia* Pax et K. Hoffm. in Engl., Pflanzenr. 81 : 245. 1922 (*pro parte, non Cyclostemon longifolius* Bl.).

Trees ; branches terete, rigid. Leaves 10–20 × 3–4.5 cm, oblong, coriaceous, entire or distantly and shallowly serrate, glabrous, abruptly acuminate at apex ; main nerves about 10 pairs, jointed by prominent reticulation ; petioles ± 0.5 cm long, thick. Flowers axillary, sessile, unisexual. Drupes ± 2 cm across, subglobose, tomentose or strigose.

Fl. & Fr. : March–August.

Courtallum (Robert Wight 934, CAL).

9. ERIOCOCCUS Hassk.

Eriococcus ovalifolia (Wt.) K.K.N. Nair, J. Bombay nat. Hist. Soc. 79 : 453. 1982. *Reidia ovalifolia* Wt., Ic. t. 1904, f. 3. 1852. *Phyllanthus longiflorus* Wall. (Cat. no. 7905. 1847 *nom. nud.*) ex Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 302. 1887. *Reidia longiflora* Gamble, Fl. Presid. Madras 2 (7) : 1293. 1925.

Bushy shrubs, 0.5–1 m high ; branches glabrous. Leaves 1–1.5 cm long, obliquely ovate, entire, glaucous beneath, subacute or apiculate at apex, acute at base ; petioles very short. Flowers white, solitary, axillary. Capsules ± 0.4 cm long, smooth, glabrous.

Fl. & Fr. : October–August.

Fairly common in the shrubby areas around Tekkumalai.

10. EUPHORBIA Linn.

1a. Plants armed with stipular spines

2a. Leaves very deciduous, the mature plants without leaves ; branching irregular

E. antiquorum 1

2b. Leaves persistent, mature plants leafy ; branching whorled

E. nivulita 4

1b. Plants unarmed

3a. Shrubs or trees ; leaves inconspicuous, soon deciduous

E. tirucalli 6

3b. Herbs or undershrubs ; leaves persistent

4a. Erect undershrubs ; stem zig-zag at least when young

E. geniculata 2

4b. Erect or prostrate herbs ; stem not zigzag when young

5a. Gland of the involucre with a conspicuous petaloid limb

E. rosea 5

5b. Gland of the involucre without a petaloid limb or the limb inconspicuous

E. hirta 3

1. *Euphorbia antiquorum* Linn., Sp. Pl. 450. 1753 ; Wt., Ic. t. 897. 1844 45 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 255. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1273. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 7. 1954.

Shrubs or small trees, 2–5 m high ; branches fleshy, green, jointed, 3–5 sinuately winged. Leaves up to 1 cm long, oblong, fleshy, glabrous, rounded or obtuse at apex, cuneate at base, very deciduous. Flowers yellowish in terminal and subterminal cyathia. Capsules \pm 1 cm in diameter, compressed, glabrous.

Fl. & Fr. : September–March.

Common in the dry rocky slopes and foot hills.

2. *Euphorbia geniculata* Ort., Nov. Rar. Pl. Hort. Matr. Decad. 18. 1797 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 239. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1278. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 5. 1954.

Erect herbs, 30–60 cm high ; branches green, glabrous. Leaves 3.5–5.5 \times 1–2.5 cm, alternate below, opposite above, elliptic or obovate, glabrous, acute at apex, cuneate at base ; petioles 1–1.5 cm long, glabrous. Flowers greenish in terminal cyathia. Capsules globose, glabrous.

Fl. & Fr. : October–March.

A weed, common on the way to Five falls in waste places.

3. *Euphorbia hirta* Linn., Sp. Pl. 454. 1753 ; Gamble, Fl. Presid. Madras 2 (7) : 1275. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 15. 1954. *E. pilulifera* auct. non Linn. ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 250. 1887.

Erect herbs, 20–30 cm high ; branches simple, jointed, hairy, purplish. Leaves 2.5–4 \times 1.5–2 cm, obliquely lanceate, rarely elliptic, serrulate, acute at apex, rounded or cuneate at base ; petioles \pm 0.3 cm

long. Flowers green in terminal clustered, cyathia. Capsules 0.2-0.3 cm in diameter, hairy.

Fl. & Fr. : October - April.

Common in the teak plantations on the way to Five falls and also in the wet soil around Shembagadevi falls.

4. *Euphorbia nivulia* Buch. Ham., Trans. Linn. Soc. Lond. 14 : 286. 1825 ; Wt., Ic. t. 1862. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 225. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1277. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 7. 1954. *E. nereifolia* Roxb., Fl. Ind. 2 : 467. 1832 (*non* Linn., *nec* Willd.). *Elakalli* (Malayalam). *Ilakkalli*, *Manchevi*, *Nanangalli* (Tamil).

Armed, fleshy trees, 3-6 m high ; branches whorled, with stipular spines, glabrous. Leaves sessile or sub-sessile, 10-20 × 3-5.5 cm, suborbicular, fleshy, glabrous, rounded at apex, tapering towards the base ; midrib conspicuous, lateral nerves obscure. Flowers greenish in solitary or twin cyathia from the axils of fallen leaves.

Fl. : March-May.

Below Honey falls, rare along the sides of rocks.

5. *Euphorbia rosea* Retz., Obs. Bot. 4 : 26. 1786 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 251. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1275. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 13. 1954.

Prostrate herbs, 15-20 cm long ; branches woody at base, glabrous or hairy. Leaves up to 1 × 0.5 cm, obliquely obovate or linear-spathulate, coriaceous, crenate or dentate towards apex, obtuse or rounded at base ; petioles obscure. Flowers reddish in axillary or terminal cyathia ; involucre glands rose. Capsules 0.2-0.3 cm long, glabrous.

Fl. & Fr. : March - October.

Common, spreading on waste grounds on the way to Five falls and in Tekkumalai.

6. *Euphorbia tirucalli* Linn., Sp. Pl. 452. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 254. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1276. 1925 ; Sant., Bull. Bot. Soc. Bengal 8 : 5. 1954.

Erect, dichotomously branched shrubs, 1-2.5 m high ; branches forming dense crown, green, striate, glabrous ; internodes 8-12 cm long, terete. Leaves 0.5-1 cm long, deciduous, spathulate or oblong, obtuse at apex, acute at base, succulent.

A hedge plant growing wild along the outskirts of the reserve forests on the way to Five falls.

11. EXCOECARIA Linn.

Excoecaria crenulata Wt., Ic. t. 1865. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 473. 1887 ; Pax in Engl., Pflanzener. 52 : 160. 1912 ; Gamble, Fl. Presid. Madras 2 (7) : 1345. 1925. *Tillai* (Tamil).

Shrubs or trees ; branches glabrous. Leaves 6-9 × 1.5-2.5 cm, lanceate or oblanceate, chartaceous, sinuate-crenate, acuminate at both ends ; petioles ± 0.5 cm long. Flowers monoecious or dioecious ; male flowers in terminal spikes ; female flowers solitary, axillary.

Fl. : May - August.

Courtallum (Robert Wight 827, 828, CAL).

12. GIVOTIA Griff.

Givotia moluccana (Linn.) Sreem., Taxon 24 : 696. 1975. *Croton moluccanum* Linn., Sp. Pl. 1005. 1753. *Givotia rottleriformis* Griff. ex Wt., Calcutta J. Nat. Hist. 4 : 388. 1844 & Ic. t. 1889. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 395. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1342. 1925 ; A.R. Sm., Kew Bull. 22 : 504. 1968. *Vendalai* (Tamil).

Trees, 17-20 m high ; branchlets densely stellate-tomentose. Leaves 12-17 cm long, equally broad, broadly ovate or orbicular, irregularly dentate, stellate tomentose beneath, acute at apex, cordate and deeply sinuated at base, palmately nerved ; petioles 10-15 cm long, stellate tomentose with 1 or 2 glands. Flowers yellow in axillary or terminal, tomentose, paniculate cymes. Drupes 2-2.5 cm in diameter, subglobose, 1-seeded.

Fl. & Fr. : March - July.

Rare, along the sides of Main falls in rocky places.

13. GLOCHIDION Forst. nom. gen. cons.

- | | |
|--|------------------------|
| 1a. Plants yellowish-tomentose towards apex | <i>G. tomentosum</i> 2 |
| 1b. Plants fully glabrous | |
| 2a. Leaves acuminate and mucronate at apex ;
pedicels filiform | <i>G. ellipticum</i> 1 |
| 2b. Leaves bluntly acuminate but not mucronate
at apex ; pedicels stout | <i>G. zeylanicum</i> 3 |

1. *Glochidion ellipticum* Wt., Ic. t. 1906. 1852 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 321. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1308. 1925.

Trees, 3-6 m high ; branchlets glabrous. Leaves 5.5-11.5 × 1.5-4.5 cm, oblong-lanceate or lanceate, glabrous, shiny, acuminate with a short mucro at apex, narrowed towards the base. Flowers small in axillary clusters. Capsules 0.6-1 cm long, subglobose, obscurely lobed.

Fl. & Fr. : September - February.

Common in Tekkumalai below the third wooden bridge along the sides of ravines.

2. *Glochidion tomentosum* Dalz., Kew J. Bot. 3 : 38. 1851 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 309. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1306. 1925. *Vellaiccandanum* (Tamil).

Small trees ; branchlets subangular, pubescent. Leaves 4-15 × 2-6.5 cm, elliptic or ovate-oblong, entire, pubescent beneath, acuminate at apex, rounded at base ; petioles 0.3-0.5 cm long ; stipules lanceate, hairy. Flowers greenish, in axillary fascicles, pubescent. Capsules 0.6-0.8 cm across, subglobose, beaked, obscurely lobed, pubescent.

Fl. & Fr. : Almost throughout the year.

Along the sides of the stream below Tiger falls.

3. *Glochidion zeylanicum* (Gaertn.) Juss., Tent. Euphorb. 107. 1824 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 310. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1306. 1925 ; Alston, Ann. R. Bot. Gard. Peradeniya 11 : 2. 1928. *Bradleia zeylanica* Gaertn., Fruct. 2 : 128, t. 129. 1791. *Kumbalam* (Tamil).

Trees, 3-6 m high ; branchlets glabrous. Leaves 8.5-20 × 3.5-5.5 cm, broadly ovate or oblong, entire, pale beneath, bluntly acuminate at apex, rounded or oblique at base ; petioles up to 0.5 cm long, stout. Flowers greenish-yellow in supra-axillary, glabrous umbels. Capsules ± 1 cm across, subglobose, obscurely lobed, glabrous, often beaked.

Fl. & Fr. : Almost throughout the year.

Fairly common below New falls in the marshy soil along the sides of the stream.

14. *JATROPHA* Linn.

Jatropha gossypifolia Linn., Sp. Pl. 1006. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 383. 1887 ; Pax in Engl., Pflanzenr. 42 : 26. 1910 ; Gamble, Fl. Presid. Madras 2 (7) : 1340. 1925 ; Ainy Shaw, Kew Bull. 26 : 204. 1971.

Shrubs, 1-1.5 m high ; stem grey white, lenticellate. Leaves 7-10 × 8-11 cm, broader than long, 3-5 lobed ; lobes acute at apex, glandular hairy along the margins. Flowers reddish in terminal cymes. Capsules ± 1.5 cm long, oblong, 3-lobed, brownish.

Fl. & Fr. : November-April.

A common weed in the waste places and along roadsides before Five falls.

15. *KIRGANELIA* Baill.

Kirganelia reticulata (Poir.) Baill., Etud. Gen. Euphorb. 613, 614. 1858 ; Gamble, Fl. Presid. Madras 2 (7) : 1294. 1925. *Phyllanthus reticulatus* Poir. in Lamk., Enc. Meth. Bot. 5 : 298. 1804 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 288. 1887. *Kattuniruvi*, *Kilanelli*, *Nirelli* (Malayalam). *Abirange*, *Karunelli*, *Malanelli* (Tamil).

Much branched shrubs, 2-3 m high ; branches glabrous. Leaves 1.5-2 × 0.6-1.2 cm, elliptic, obovate or suborbicular, acute at apex, tapering or obtuse at base. Flowers light yellow, unisexual ; male flowers in axillary fascicles ; female flowers solitary, axillary. Berries 0.4-0.5 cm across, globose, purple when ripe.

Fl. & Fr. : April-March.

Fairly common in the plains and outskirts.

16. *MACARANGA* Thou.

Macaranga peltata (Roxb.) Muell. Arg. in DC., Prodr. 15 (2) : 1010. 1866 ; Pax in Engl., Pflanzenr. 63 : 347. 1914 ; Gamble, Fl. Presid. Madras 2 (7) : 1326. 1925. *Osyris peltata* Roxb., Fl. Ind. 3 : 755. 1832. *Macaranga roxburghii* Wt., Ic. t. 1852 & 1948, f. 4. 1853 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 448. 1887. *Vatta*, *Oothooni* (Malayalam).

Trees ; branches glaucous, tips rusty tomentose. Leaves peltate, 12-20 cm in diameter, orbicular-ovate, entire, glabrous above, tomen-

tose beneath, acuminate or acute at apex; petioles 12–20 cm long, glaucous. Flowers dioecious in axillary or terminal tomentose straight panicles.

Fl. : March–July.

Courtallum (*Robert Wight* 758, CAL).

17. MALLOTUS Lour.

- | | |
|---|-----------------------------|
| 1a. Leaves narrowed at base; capsules armed with hard, conical spines | <i>aureo-punctatus</i> |
| 2a. Capsules 1–1.3 cm across, lobes obscure; leaves rhombic-lanceate | <i>M. aureo-punctatus</i> 1 |
| 2b. Capsules 0.6–0.8 cm across, lobes prominent; leaves elliptic-lanceate | <i>M. stenanthus</i> 4 |
| 1b. Leaves acute or rounded at base; capsules unarmed | |
| 3a. Capsules tomentose or hairy, red | <i>M. philippensis</i> 2 |
| 3b. Capsules minutely tomentose, green | <i>M. rhamnifolius</i> 3 |

1. *Mallotus aureo punctatus* (Dalz.) Muell.-Arg. in DC., Prodr. 15 (2) : 973. 1866; Pax in Engl., Pflanzenr. 63 : 162. 1914; Gamble, Fl. Presid. Madras 2 (7) : 1323. 1925. *Rottlera aureo-punctata* Dalz., Kew J. Bot. 3 : 122. 1851. *Mallotus lowii* Muell.-Arg., Linnaea 34 : 192. 1865; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 438. 1887 (*pro parte*). *M. muricatus* (Wt.) Muell.-Arg., Linnaea 34 : 191. 1865 (*quod basionym*); Pax, loc. cit. p. 160; Hook. f., loc. cit. p. 436; Gamble, loc. cit. p. 1322. *Claoxylum muricatum* Wt., Ic. t. 1886. 1852.

Shrubs, 2–3 m high; branchlets pubescent or glabrous. Leaves 7.5–15.5 × 3–5.5 cm, rhombic-lanceate, coriaceous, entire or sinuate, glabrous, bluntly acuminate at apex, narrowed at base; petioles 0.5–1 cm long, pubescent. Flowers greenish-yellow; male flowers fascicled along the rachis; female flowers in few flowered axillary racemes. Capsules 1–1.3 cm across, spinescent, minutely pubescent.

Fl. & Fr. : October–March.

Rare, in Tekkumalai as an undergrowth.

2. *Mallotus philippensis* (Lamk.) Muell.-Arg., Linnaea 34 : 196. 1865; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 442. 1887; Pax in Engl., Pflanzenr. 63 : 184. 1914; Gamble, Fl. Presid. Madras 2 (7) : 1322. 1925; Airy Shaw, Kew Bull. 26 : 300. 1971. *Croton philippense* Lamk., Enc.

Meth. Bot. 2 : 206. 1786. *Cenkolli*, *Kapila*, *Kuramattukka*, *Mannana* (Malayalam). *Avam*, *Curangicari*, *Kabilam*, *Kaislappodi* (Tamil).

Shrubs or small trees, 2.5 - 6 m high ; branchlets tomentose. Leaves 8 - 16 × 3 - 15 cm, ovate or ovate lanceate, entire or dentate, glabrous above, glandular beneath, acuminate at apex, obtuse or acute at base ; petioles 3 - 5.5 cm long, hairy, with two glands at the apex. Flowers yellowish in terminal panicles of spikes. Capsules ± 1 cm across, 3 lobed, tomentose or hairy, red.

Fl. & Fr. : October - August.

Very common almost throughout the area.

3. *Mallotus rhamnifolius* (Willd.) Muell.-Arg., *Linnaea* 34 : 196. 1865 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 440. 1887 ; Pax in Engl., *Pflanzenr.* 63 : 180. 1914 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1322. 1925. *Croton rhamnifolius* Willd., *Ges. Naturf. Fr. Neue Schr.* 4 : 190. 1803.

Trees, 3 - 6 m high ; branchlets pubescent or tomentose. Leaves 4.5 - 15 × 3 - 6 cm, ovate oblong or lanceate, entire or sinuate, yellow glandular beneath, acute at apex, acute or rounded at base ; petioles 1.5 - 4 cm long, pubescent. Flowers greenish ; male flowers in terminal panicles ; female flowers solitary, axillary. Capsules ± 1 cm across, yellow - glandular, stellate - tomentose, greenish.

Fl. & Fr. : October - August.

Rare, above Shembagadevi and on the way to Old Courtallum.

4. *Mallotus stenanthus* Muell.-Arg., *Linnaea* 34 : 191. 1865 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 437. 1887 ; Pax in Engl., *Pflanzenr.* 63 : 190. 1914 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1322. 1925.

Trees, 3 - 4.5 m high ; branches glabrous or puberulous. Leaves up to 12 × 4.5 cm, elliptic lanceate, subcoriaceous, almost glabrous, entire or sinuate, acuminate at apex, narrowed at base. Flowers greenish in slender, axillary and terminal racemes. Capsules 0.6 - 0.8 cm across, prominently yellow glandular with few scattered spines.

Fl. & Fr. : October - March.

Fairly common below Shembagadevi and Five falls.

18. *MEINECKIA* Baill.

Meineckia longipes (Wt.) Webster, *Acta Bot. Neerl.* 14 : 352, f. 6, 15, 23. 1965. *Peltandra longipes* Wt., *lc.* 5 (2) : 25, t. 1891. 1852.

Phyllanthus longipes (Wt.) Muell.-Arg., *Linnaea* 32 : 11. 1863 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 287. 1887. *Neopeltandra longipes* (Wt.) Gamble, *Fl. Presid. Madras* 2 (7) : 1236. 1925.

Woody, glabrous shrubs. Leaves 5-9 × 2-3.5 cm, ovate or ovate-elliptic, membranous, glabrous, abruptly acuminate at apex, rounded or acute at base ; petioles 0.2-0.3 cm long. Flowers greenish, axillary, monoecious ; male flowers in clustered, racemiform bracteate, 0.2-0.4 cm long ; female flowers solitary, long pedicelled. Capsules small, 3-loculed.

Fl. & Fr. : October - August.

Common in the outskirts around Main falls.

19. PEDILANTHUS Neck. *nom. gen. cons.*

Pedilanthus tithymaloides (Linn.) Poit., *Ann. Mus. Hist. Nat. Paris* 19 : 390, t. 19. 1812 ; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 239. 1887 ; Gamble, *Fl. Presid. Madras* 2 (7) : 1346. 1925 ; Robert L. Dressler, *Contr. Gray Herb. Harv.* 182 : 136. 1957. *Euphorbia tithymaloides* Linn., *Sp. Pl.* 453. 1753.

Feebly branched undershrubs, 0.5-1.5 m high ; stem and branches green, glabrous, cylindrical with milky latex. Leaves 5-12 × 3-6 cm, broadly ovate, entire, fleshy, dark green, acute at apex, cordate at base ; petioles ± 0.5 cm long. Flowers scarlet in slipper shaped cyathia, ± 1 cm in length.

Fl. : February - March.

A hedge plant common on the way to Five falls.

20. PHYLLANTHUS Linn.

1a. Fruits berries

P. emblica 2

1b. Fruits capsular

2a. Filaments of the stamens connate into a column

3a. Herbs or undershrubs

4a. Leaves elliptic or obovate, 1.5-2 × 0.8-1.2 cm, distantly arranged ; petioles 0.1-0.2 cm long

P. mitsionis 3

4b. Leaves linear, up to 1 × 0.4 cm, closely arranged ; petioles absent

P. urinaria 5

- 3b. Shrubs or trees
- 5a. Leaves elliptic or obovate, 0.6—1.2 cm broad, acute, distantly arranged *P. debilis* 1
- 5b. Leaves linear, up to 0.3 cm broad, rounded, truncate or apiculate at apex, closely arranged *P. polyphyllus* 4
- 2b. Filaments of the stamens free *P. virgatus* 6

1. **Phyllanthus debilis** Klein ex Willd., Sp. Pl. 4 : 582 83. 1804 ; Gamble, Fl. Presid. Madras 2 (7) : 1290 1925 ; Webster, J. Arnold Arbor. 38 : 307. 1957. *P. niruri* var. *javanicus* Muell.-Arg., Linnaea 32 : 43. 1863 & in DC., Prodr. 15 (2) : 407. 1866. *P. niruri* var. *debilis* Muell. Arg., Linnaea 32 : 43. 1863. *P. debilis* Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 299. 1887.

Shrubs, 1–2 m high ; branches glabrous. Leaves 1–1.5 × 0.8–1.2 cm, elliptic or obovate, entire, shiny above, pale beneath, acute at apex, acute or oblique at base ; petioles obscure (\pm 0.1 cm long). Flowers greenish white, monoecious, axillary. Capsules 0.2–0.4 cm across, trilobed.

Fl. & Fr. : August–March.

Fairly common at Main falls and in the sholas around Honey falls.

2. **Phyllanthus emblica** Linn., Sp. Pl. 982. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 289. 1887 ; Webster, J. Arnold Arbor. 38 : 76. 1957. *Emblica officinalis* Gaertn., Fruct. 122–123, pl. 108, f. 2. 1790 ; Gamble, Fl. Presid. Madras 2 (7) : 1295. 1925. *Nelli*, *Nellikamaram*, *Amalakam* (Malayalam). *Indul*, *Amalakam*, *Nelli*, *Perunelli* (Tamil).

Trees, 3–8 m high ; branches rough, glabrous. Leaves 0.7–1.8 × 0.1–0.3 cm, linear or rarely linear-oblong, apiculate at apex, obtuse or acute at base ; petioles obscure. Flowers greenish, monoecious in axillary fascicles. Berries 0.8–1.3 cm across, depressed globose, smooth.

Fl. & Fr. : November–April.

Quite common around Old Courtallum, in the thick shady forest.

3. **Phyllanthus missionis** Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 297. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1290. 1925.

Herbs or undershrubs ; branches glabrous. Leaves 1.5–2 × 0.8–1.2 cm, elliptic or obovate, distantly arranged, glabrous, acute or rounded

at apex : petioles 0.1 - 0.2 cm long. Flowers pale white on 0.6 - 0.8 cm long peduncles, gradually enlarging towards apex. Capsules 0.2 - 0.3 cm across, almost globose with persistent calyx.

Fl. & Fr. : July.

Courtallum (C.A. Barber 3246, 3383, CAL).

4. *Phyllanthus polyphyllus* Willd. Sp. Pl. 4 : 586. 1805 ; Wt., Ic. t. 1895, f. 2. 1852 ; Hook. f. in Hook f., Fl. Brit. Ind. 5 : 290. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1288. 1925. *Kattunelli, Kilarannelli* (Malayalam). *Kilanelli* (Tamil).

Large shrubs, 3 - 4.5 m high ; branches glabrous, terete. Leaves sessile, 0.5 - 1.5 × 0.2 - 0.3 cm, linear, glabrous, obtuse or apiculate at apex, rounded or subcordate at base. Flowers greenish white, solitary, axillary. Capsules ± 0.5 cm across, depressed globose, 3 lobed, smooth.

Fl. & Fr. : May - December.

Rare, along the sides of the small canal in the Teak plantations on the way to Five falls.

5. *Phyllanthus urinaria* Linn., Sp. Pl. 982. 1753 ; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 293. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1289. 1925 ; Webster, J. Arnold Arbor. 38 : 194, f. 9. 1957.

Erect herbs, 30 - 50 cm high ; branches glabrous. Leaves sessile, 0.7 - 1 × 0.2 - 0.4 cm, linear, membranous, glabrous, pale beneath, hispid along the margins, acute and mucronate at apex, obtuse or oblique at base. Flowers minute, subsessile, solitary, axillary. Capsules 0.2 - 0.3 cm across, globose or depressed globose, trilobed, verrucose.

Fl. & Fr. : July.

Courtallum (C.A. Barber 3326, CAL).

6. *Phyllanthus virgatus* (as *virgata*) Forst. f., Fl. Ins. Austrl. Prodr. 65. 1786 ; Airy Shaw, Kew Bull. 26 : 325. 1971. *P. simplex* Retz., Obs. Bot. 5 : 29. 1789 ; (var. *genuninus*) Muell. Arg. in DC., Prodr. 15 (2) : 391. 1866 ; Hook. f. in Hook f., Fl. Brit. Ind. 5 : 295. 1887 ; Gamble, Fl. Presid. Madras 2 (7) : 1289. 1925. *P. simplex* var. *virgatus* (Forst. f.) Muell. Arg., Linnæa 32 : 32. 1863 & in DC., Prodr. 15 (2) : 391. 1866.

Erect or diffuse, glabrous herbs, 30 - 40 cm high ; stem unbranched or feebly branched. Leaves up to 1.8 × 0.7 cm, distichous, linear-oblong, apiculate at apex, rounded at base ; stipules sagittate. Flowers solitary, axillary, long pedicelled. Capsules ± 0.5 cm across, trilobed.

Fl. & Fr. : August.

Courtallum (Robert Wight 779, CAL).

21. *SAUROPUS* Bl. *nom. gen. cons.*

Sauropus quadrangularis (Willd.) Muell. Arg., *Linnaea* 32 : 73. 1863 & in DC., *Prodr.* 15 (2) : 242. 1866 (excl. var. *pubescens*); Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 335. 1887; Pax et K. Hoffm. in Engl., *Pflanzenr.* 81 : 223. 1922; Gamble, *Fl. Presid. Madras* 2 (7) : 1303. 1925. *Phyllanthus quadrangularis* Willd., *Sp. Pl.* 4 : 585. 1805.

Glabrous, twiggy shrubs. Leaves 0.7-2 × 0.5-1.2 cm, suborbicular or elliptic, thin, glabrous, acute or rounded at apex, acute, obtuse or narrowed at base; petioles ± 0.1 cm long. Flowers axillary, solitary or paired; male flowers long pedicelled. Capsules up to 0.5 cm in diameter, depressed globose, with persistent calyx.

Fl. & Fr. : July.

Courtallum (C.A. Barber 3398, CAL).

22. *SECURINEGA* Comm. ex Juss. *nom. gen. cons.*

1a. Plants armed

S. leucopyrus 1

1b. Plants unarmed

S. virosa 2

1. *Securinega leucopyrus* (Willd.) Muell. Arg. in DC., *Prodr.* 15 (2) : 451. 1866; Airy Shaw, *Kew Bull.* 25 : 493. 1971. *Flueggea* (*Fluggea*) *leucopyrus* Willd., *Sp. Pl.* 4 : 757. 1805; Wt., *Icon.* 1875. 1852; Hook. f. in Hook. f., *Fl. Brit. Ind.* 5 : 328. 1887; Gamble, *Fl. Presid. Madras* 2 (7) : 1296. 1925. *Perinclavu* (Malayalam). *Madpulant* (Tamil).

Trees, up to 4 m high; branches straggling, angular, slender. Leaves 1.5-2.5 × 1-1.5 cm, obovate, elliptic or obcordate, entire, glaucous and reticulately veined beneath, obtuse at both ends. Flowers greenish yellow, axillary, monoecious; male flowers in clusters; female flowers solitary. Berries ± 0.5 cm across, globose, white.

Fl. & Fr. : April - November.

Fairly common in the scattered dry forest floor before Tekkumalai.

2. *Securinega virosa* (Roxb. ex Willd.) Pax et K. Hoffm. in Engl. & Prantl, *Pflanzenfam.* (ed. 2) 19C : 60. 1931. *Phyllanthus virosus* Roxb.

ex Willd., Sp. Pl. 4 : 578. 1805. *Flueggea microcarpa* Bl., Bijdr. 580. 1825; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 328. 1887. *F. virosa* Baill., Etud. Gen. Euphorb. 393. 1858; Gamble, Fl. Presid. Madras 2 (7) : 1296. 1925. *Perinkluy* (Malayalam). *Irubulai*, *Varadbula* (Tamil).

Unarmed shrubs; branches woody, young ones angular. Leaves 2.5–7.5 × 1.5–3.5 cm, elliptic, ovate or obovate, entire, glabrous, subacute or obtuse at apex, acute or cuneate at base, reticulate beneath. Flowers axillary; male flowers in clusters; female flowers solitary. Berries 0.4–0.8 cm in diameter, globose, white.

Fl. & Fr. : April–August.

Courtallum (*C.A. Barber* 3299, 3393; *Robert Wight* 774, CAL).

23. TRAGIA Linn.

Tragia involucrata Linn., Sp. Pl. 980. 1753; Hook. f. in Hook. f., Fl. Brit. Ind. 5 : 465. 1887 (*ex parte*); Pax in Engl., Pflanzenr. 68 : 81. 1919; Gamble, Fl. Presid. Madras 2 (7) : 1332. 1925. *Choricannan*, *Kodithua* (Malayalam).

Straggling, hispid herbs, 30–60 cm long; stem with scattered stinging hairs. Leaves 2–10 × 1.5–4.5 cm, oblong-lanceate or broadly ovate, serrate, abruptly acuminate at apex, rounded at base; petioles 0.5–1.5 cm long. Flowers greenish-yellow in terminal racemes. Capsules 0.5–0.8 cm across, trilobed, hispid.

Fl. & Fr. : March–August.

A common weed in the waste places.