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Floristic Studies in Aralam Wildlife Sanctuary



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Kerala Forest Research Institute

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FLORISTIC STUDIES IN ARALAM WILDLIFE SANCTUARY

N Sasidharan



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ABSTRACT OF PROJECT PROPOSAL

- Code : KFRI/568/2009
- Title : Floristic studies in Aralam Wildlife Sanctuary
- Objectives :
- To make an inventory of the plants in the study area.
 - To make floristic analysis, with emphasis on dominant plant groups, endemics, rare and threatened plants.
 - To find out areas with respect to species richness.
 - To prepare a digital herbarium with accession-retrieval system
- Date of commencement : May, 2009
- Scheduled date of completion : January, 2012
- Funding Agency : Kerala Forest Department (Development)
- Investigator : N Sasidharan
- Research Fellows : KV Binu (up to 16.08.2010)
KJ Dantas (from 04.10.2010)

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ACKNOWLEDGEMENTS

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ABSTRACT

Aralam Wildlife Sanctuary situated in the Kannur Revenue district of Kerala is along the northwest slopes of Western Ghats. It is contiguous with the forests of Coorg (Kodagu) district of Karnataka state and lies between 11.88° and 11.98° North latitude and 75.79° and 75.93° East longitudes. The Sanctuary occupies an area of 55 km². The major vegetation types of the Sanctuary are evergreen and semi-evergreen forests. Moist deciduous forests, Southern Hill-top evergreen forests and grasslands are the other vegetation types. About 490 ha of area is covered by plantations, comprised of 291.30 ha teak, 167 ha Eucalyptus and 30 ha cashew. Eucalyptus and Cashew plantations are in an abandoned stage.

During the study, 1,005 species of flowering plants belonging to 597 genera under 128 families and two sub families were collected and described. Dicotyledons have 818 species belonging to 476 genera under 108 families and 2 sub families. Monocotyledons are represented by 186 species in 120 genera under 19 families. Gymnosperm is represented with single family and single species. Fabaceae with 83 species is the largest family. Rubiaceae with 59 species come next. Twenty four Dicot families, 4 Monocot families and 1 Gymnosperm family are represented with only single species. Four hundred and one genera are represented with only single species. *Lepidagathis keralensis* Madhu. & Singh, *Pogostemon peethapushpum* Pradeep, *Orophea sivarajanii* Sasidh., *Miliusa wayanadica* Sujanapal, Ratheesh & Sasidh., *Impatiens veerapazhasii* Ratheesh, Sujanapal & Meera and *Combretum recurvatum* Sujana, Ratheesh & Anil, new species recently described from northern Kerala are also collected from the Sanctuary.

Aralam Wildlife Sanctuary falls with in the Nilgiri-Silent Valley-Wayanad-Kodagu endemic centre in Southern Western Ghats. Out of the 1,005 species recorded from the Sanctuary, 274 are endemic to the Peninsular India and 135 among them restricted to the southern Western Ghats. *Ophiorrhiza barberi* endemic and restricted to the Agasthyamala and Pulny Hills of southern Western Ghats is now collected from the Sanctuary. *Campbellia cytinooides*, *Christisonia bicolor*, *Discospermum apiocarpum*, *Eriocaulon thwaitesii*, *Impatiens goughii*, *I. hensloviana*, *Ipomoea barlerioides*, *Nothopegia*

monadelpha, *Paspalum canarae*, *Piper argyrophyllum*, *P. wightii*, *Psychotria bisulcata*, *Symplocos macrophylla* and *Cinnamomum perrottetii* were reported from the Nilgiris by Gamble (1915-1936) and Hooker (1872-1897). But these species were not collected during the recent floristic studies in the Nilagiri region of Kerala. The present collection of these species from the Sanctuary is new record of occurrence north to Palakkad Gap. *Psychotria dalzelli*, distributed in the Carnatic and Northern and Central Western Ghats, is also collected from the Sanctuary. *Impatiens lawsonii* and *I. stocksii* two scapigerous species believed to be distributed in Western Ghats of Karnataka (Bhaskar, 2012) are now collected from the Sanctuary. During the present study, 59 species placed under various threat categories were collected from the Sanctuary. Among these, *Allophylus concanicus*, *Dipterocarpus bourdillonii* and *Hopea erosa* are Critically Endangered

Ambalappara is the highest peak of the Sanctuary. Ambalappara-Pothurumi area has rich diversity of plants. Over 300 the species collected, 190 are exclusive to this area in the Sanctuary. The number of species collected from different Sections of the Sanctuary are 712 species (Chavachi); 621 (Narikadvu) and 390 (Aralam). The higher diversity in the Chavachi is because of the undisturbed Evergreen forests and also Ambalappara-Pothurumi area falls in this Section. Aralam is the main watershed area of Cheenkani puzha one of the main tributary of Valapatanam River which is the main water resource of Kannur revenue district. Cheenkani puzha has a key roll in enriching the water level in Valapatanam River.

In the Flora of Cannanore District by Ramachandran and V J Nair, 1,132 species were described. Their study area was 3,670 sq. km. Aralam Sanctuary has only 55 sq. km area and half of the Sanctuary are vested forest and was subjected to irrational felling, still 1,005 species could be recorded during the present study. Among them, 247 species are new additions to the flora of Kannur district. This shows the floral richness and diversity of the Sanctuary.

1. Introduction

People have been trying to understand and utilize the biodiversity from time immemorial mainly for food. When man began settled life, they started agriculture in areas around their settlements. As civilization progressed, man exploited more natural resources like timber, biomedicines and animals for better living. In the past, the natural resources were plenty and demand was less. Therefore, the exploitation was limited and did not affect the biodiversity. Increase in the population led to the conversion of large natural areas in to agricultural land and over exploitation of natural resources. The continued unsustainable exploitation resulted in the loss of biodiversity. On an average 12 per cent of the species have become threatened or endangered and some disappeared. The situation is very grave in tropical regions, the home of more than 55 per cent of the recorded biodiversity. Concern about sustainability and loss of biodiversity are increasingly being voiced from all parts of the globe. Various aspects of the problem are being highlighted for the last three decades by authors like Raven, 1988; Reid and Miller, 1989; Mc Neely, 1992 and Mc Neely *et al.*, 1990)

The millennium ecosystem assessment concluded that over the past 50 years, 60 per cent of all ecosystem services like watershed protection, hazard protection, climatic regulation etc have declined as a direct result of the growth of agriculture, industry, forestry, fisheries etc (Kinzing *et. al.* 2011). So the need for conserving ecosystem has increased. Monitoring is a crucial element of nature conservation and mangment in a rapidly changing world (Pertti Saurola, 2008). Ecologists are trying to understand the role of biodiversity in ecosystem functions (Pedro Flombaum and Osvaldo, 2012). The first and foremost step to understand the ecosystem is the identification of each group in the ecosystem.

The Western Ghats, one of the megadiversity centres in India and is also a biodiversity hotspot. Several forest areas of Western Ghats are yet to be thoroughly explored. Developmental pressure on forest areas of Kerala is high. Due to a variety of reasons, degradation of forests along the Western Ghats has taken place during the past few decades. Among the flowering plants of Kerala, as many as 497 species are placed under various threatened categories

as per the IUCN criteria (Sasidharan, 2011). Some are presumed to be extinct. However, recent floristic studies in the Protected Areas (PAs) of Kerala (Sasidharan, 1997, 1998, 1999 & 2002) have been successful in relocating many rare and endangered species. Kerala is a densely populated state and the biotic pressure on nature and natural resources is relatively high. *In situ* conservation of red listed category species is most effective if they are occurring in PAs. The Kerala Forest Department has initiated a programme for inventorising the biodiversity of the PAs with the overall objective of preparing the Management plans. The Floras of PAs such as Neyyar, Shenduruny, Periyar Tiger Reserve, Thattekkad, Peechi-Vazhani, Chinnar and Parambikulam Tiger Reserve have already been completed. Aralam Wildlife Sanctuary is one among the 22 PAs and the northernmost Wildlife Sanctuary in Kerala state. The Sanctuary has not been subjected to detailed floristic study to bring out the floristic wealth. Before the establishment of the Sanctuary, Ramachandran & Nair studied the Flora of Cannanore District (1988). However, collections from Aralam Sanctuary areas are scanty. In Kerala, most of the Protected Areas are located in the southern and central regions. Among the four Wildlife Sanctuaries in northern Kerala, the flora of Aralam Wildlife Sanctuary is more significant because the vegetation is dominated by West coast tropical evergreen and West coast semi-evergreen forests as per the classification of Champion & Seth (1968). These forest types are the habitats of most of the rare, endangered as well as endemic species. The present study was taken up to prepare the Flora of Aralam Wildlife Sanctuary with emphasis on endemic as well as threatened species.

2. Review of earlier work

Plants have been studied in India from time immemorial, mainly with regards to their medicinal properties. The systematic and scientific studies in this region were initiated by Europeans, who came to our country. Gracia da Orta's 'Os Couloquios' published from Goa in 1565 is chronologically the first botanical publication in India (Santapu, 1958). The first publication of any real importance on the botany of India is '*Hortus malabaricus*' by Henry Van Rheede during 1678-1893 (Santapau 1958). Linnaeus (1753) mainly depended on this work while naming Indian plants in '*Species plantarum*'.

The British botanists made major contributions to the floristic studies in India. Among the botanists, who worked on the peninsular India, the contributions of Robert Wight are the most outstanding. His major publications are *‘Illustrations of Indian Botany’* (1840) and *‘Icons Plantarum Indiae Orientalis’* (1838-1853). He described several new taxa from Kerala. R. H. Beddome comes next to Robert Wight with regards to floristic studies in Peninsular India. His publications are *‘The Flora Sylvatica of South India’* (1869-1874) and *‘Icones Plantarum Indiae Orientalis’* (1868-1874) in which many south Indian species including trees were described. The seven volumes of *‘Flora of British India’* by Joseph Dalton Hooker were published during 1872-1897, which covered phanerogames of the erstwhile British India. *Flora of Presidency of Madras* (J. S. Gamble in 1915 and completed by C.E.C Fisher in 1936) covers most parts of Andrapradesh, Karnataka, Tamilnadu, and Kerala. *The forest trees of Travancore* (Bourdillon, 1908) and *Flowering Plants of Travancore* (Rama Rao, 1914) are important works on the flora of Kerala.

Floristic explorations have been going in many parts of Kerala. These localized studies have resulted in the publication of many new taxa and new records from Kerala. Some important publications are *Flora of Calicut* (Manilal and Sivarajan, 1982), *Flora of Cannanore District* (Ramachandran and Nair, 1988), *Flora of Palgat* (Vajravelu, 1990), *Flora of Thiruvananthapuram District* (Mohanan and Henry, 1994), *Flowering Plants of Thrissur forests (Western Ghats, Kerala, India)* (Sasidharan and Sivarajan, 1996), *Flora of Pathanamthitta District* (Anilkumar, Sivadasan and Ravi, 2005), *Flora of Alappuzha District* (Sunil and Sivadsan, 2009), etc. Apart from these, some floristic studies were also completed as research and Ph.D programs. The notable works are *Studies on the Flora of Quilon District* (Mohanan, 1984), *Studies on the Vasular Flora of Kasaragod division of Cannanore district* (Ansari, 1985), *Systematic studies on the Flora of Kottayam District, Kerala* (Antony, 1989), *Flora of Malappuram District (excluding Nilambur Forest Division)* (Babu, 1990).

Floristic studies on many Protective Areas of Kerala have been completed during the last three decades. The notable publications are *Flora of Silent Valley Tropical Rain forests of India* (Manilal, 1988); *Flora of Thenmala Division* (Subramaniyan, 1995); *Flora of Nilambur* (Sivarajan and Philip

Mathew, 1996); *Studies on the Flora of Shenduruny Wildlife Sanctuary* (Sasidharan, 1997); *Studies on the Flora of Periyar Tiger Reserve* (Sasidharan, 1998); *Studies on the Shola Forests of Kerala* (Swarupanandan, *et. al.*, 1998); *Studies on the Flora of Chinnar Wildlife Sanctuary* (Sasidharan, 1999); *Floristic studies in Parambikulam Wildlife Sanctuary* (Sasidharan, 2002) and *Flora of Agasthyamala* (Mohanan and Sivadasan, 2002), etc.

Floristic explorations in the Malabar region were carried out earlier by botanists like van Rheede, Robert Wight, RH Beddome, CA Barber, MA Lawson, JS Gamble, CEC Fisher, *et.al.* Their floristic explorations resulted in the publications of several new plants from the Kannur district, which is a part of Malabar region. There are 94 botanical names with specific epithets “*malabarica*, *malabaricus*, *malabathrum* and *malabaricum*”, denoting the Malabar region. The Flora of the erstwhile Kannur district was studied during 1980s by Ramachandran and Nair and published the *Folra of Cannore District* in 1988. Many plants included in their flora are now in the Wayanad district which was established in 1980. Observations on the vegetation of Tellicherry division of Cannanore district was also done by Ramachandran in 1983. Ethnobotanical studies were also carried out by Ramachandran and Nair (1981, 1987). Menon (1998) carried out vegetation mapping of the Aralam Wildlife Sanctuary. Udayan *et al.*, (2004) published some additions to the flora of Kannur district based on their collections from Kottiyur reserve forests, which is adjacent to the Aralam Wildlife Sanctuary. Rajith and Ramachandran (2010) published a list of plants used in the Ethno medicines of Kurichas of Kannur district. Jomy Augustin *et. al.* (2010) published some endemic and threatened plants of Aralam Sanctuary.

3. Area of study

3.1. Location

Aralam Wildlife Sanctuary situated in the Kannur revenue district of Kerala is along the northwest slopes of Western Ghats. It is contiguous with the forests of Coorg (Kodagu) district of Karnataka state and lies between 11.88° and 11.98° North latitude and 75.79° and 75.93° East longitudes. The altitude varies between 60 m to 1,500 m above sea level. The Sanctuary falls within the

Nilgiri-Silent Valley-Wayanad-Kodagu subcentre, one of the richest regions with respect to diversity and endemism in the entire Western Ghats region. It is estimated that 150 endemic species are exclusive to this region (Nayar, 1996).

3.2. History of the study area

The Sanctuary was constituted in 1984 as per the Government notification on 15th October 1984. The 'Odanthode Malavaram' of Telichery Special Division and some part of Kottiyoor Reserve Forest comprise the present Sanctuary. The 'Odanthode Malavaram' was previously a private forest and it came under Government control by The Kerala Forest (Vesting and Assignment) Act 1971.

Three thousand and sixty ha of 'Odanthode Malavaram' was clear felled for establishing the Central-State Farm. However, 178.16 ha of the clear felled area was not taken up by the Central State Farm. This area was later planted with eucalyptus and teak and became the part of the Sanctuary. Out of the remaining 3,500 ha of Odanthode Malavaram, 1,782.16 ha was transferred to the Wildlife Wing. Later, the remaining portions were also handed over for the Sanctuary. Prior to the vesting in 1971, the area was subjected to irrational felling. Some area was subjected to selection felling before constituting the Sanctuary. Portion of the Kottiyoor reserve forests near Chavachithode, which was attached to the Sanctuary was also subjected to selection felling during 1941-49. The remaining 25 sq.km is undisturbed and this area is now in the core area of the Sanctuary.

3.3. Topography

The Aralam Wildlife Sanctuary has an undulated terrain. The altitude varies from 60 m (Valayamchal) to 1,500 m (Ambalappara) above sea level. Ambalappara (1,500 m), Pothurumi (1,397 m), Mullenpara (1,500 m), Kattikari (1,100 m), Chavachimala (825 m), Kannadivechakunnu (800 m) and Kurumbankallu (850 m) are the main peaks. Cheenkannipuzha which is flowing in the west direction originates from Karnataka part of Bhramagiri. Chavachithode, the main tributary of Cheenkannipuzha originates from

Pothrumimala of the Sanctuary. Urutypuzha, originating from Karnataka part of Bhramagiri also flows along the Sanctuary. The rivers Cheenkannipuzha and Urutypuzha join Bavelipuzha which flows to the Valapattanam River (Map 1).

3.4. Geology, rock and soil

Geologically the area can be grouped in to two main rock types:-

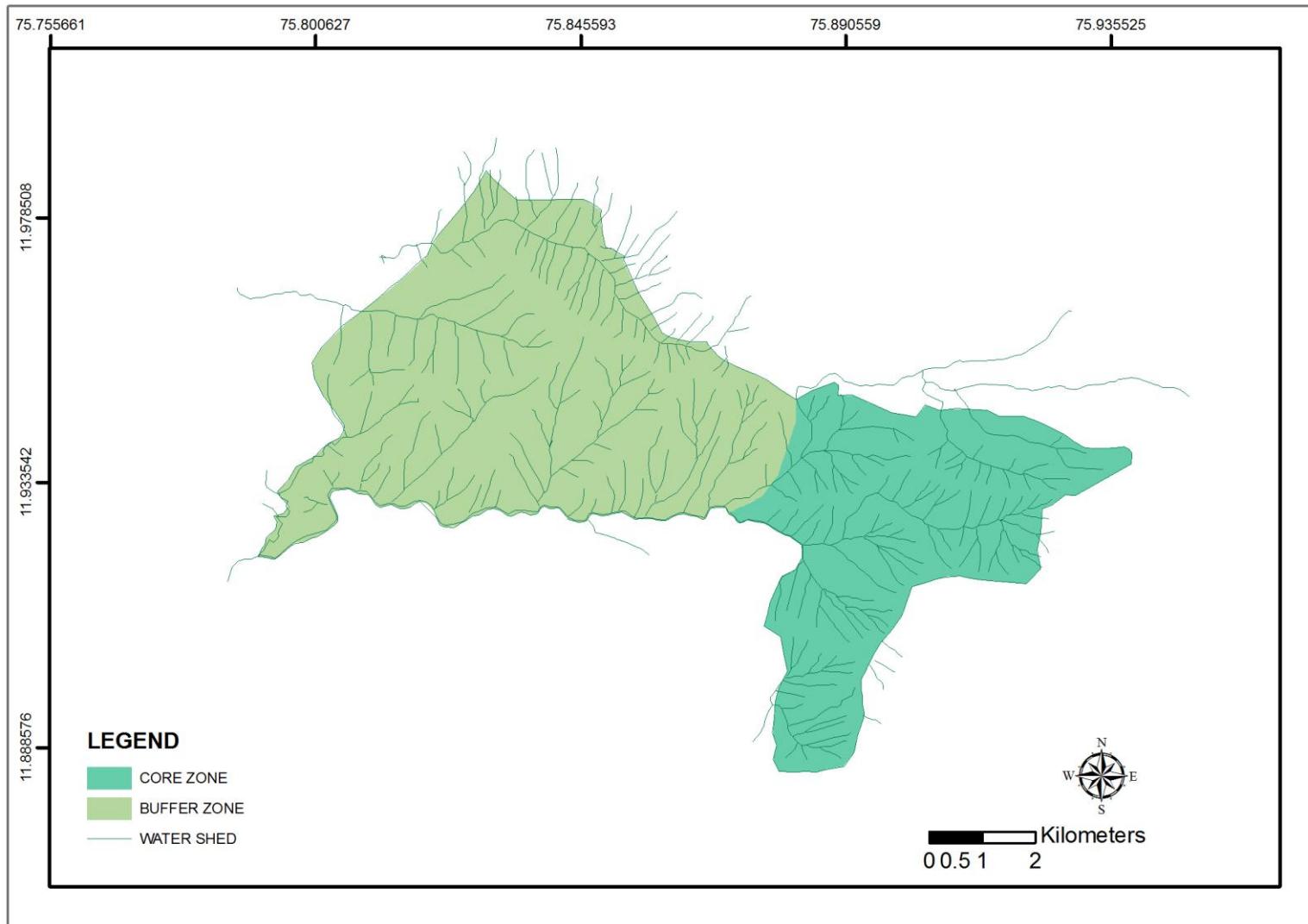
Laterite rock- this is seen in the lower reaches. Laterite is ferragenus, reddishsait rocks with irregular galleries filled with yellow clay which hardens on expose to atmospheric gensis laterite formation is attributed to monsoon condition repeated through ages. Decomposition of genesis and partial rearrangement by the mechanical action of water give rise to laterite rocks. These rocks are seen at lower elevations of the Sanctuary.

Crystalline:- the mountains of Western Ghats are composed of ancient crystallines and metamorphic rocks of archean age, mainly quartzogenesis the principal rock types are granite and their genesis variation the genesis rocks are biolate gensis their chief constituents being quartz, feldspar, biolate and granite.

Soil: - The major soil type in the area is lateritic with moderate erosion and well drained clay soils. The alluvial soils are seen along the banks of river which is flowing gently and it is well drained.

3.5. Climate

The Sanctuary receives southwest and the northeast monsoons with a maximum annual rainfall of 5,052 mm and the minimum of 3,745 mm and the number of rainy days varies from 100-120 (Gopinathan, *n.d.*). The rainfall even goes as high as over 6,000 mm in the mountin reaches. The dry season varies between 3 to 4 months when the monthly rainfall is below 50 mm. The temperature at the foothills varies from 11°C to 40°C and in the hills it is between 8°C and 25°C. The hottest months are April and May. At the foothills the humidity varies from 60 to 100%.



Map 1. Study area showing buffer core zones and water shed

4. Vegetation

The major vegetation types met with in this Sanctuary are West coast tropical evergreen forest, West coast tropical semi-evergreen forest, Southern hilltop evergreen forest, Grasslands and Plantations (Champion & Seth 1986; Chandrasekharan 1962a, 1962b; Meher-Homji, 1967, 1978 & 1984).

4.1. West coast tropical evergreen forest

This vegetation type is characterised by the profuse growth of arborescent species. The trees have a three tier composition, the highest attaining a height up to 45 m. Many trees have buttresses at base and the boles are clean, cylindrical, un-branched at least up to two-thirds of their height and generally with a spreading or umbrella shaped crown. The middle stratum is more or less candle shaped and the lower is characteristically conical. Dense growth with orchids, aroids, mosses, ferns and lichens on trees are common. Cauliflory is not rare. The dominant upper storey consists chiefly of *Artocarpus heterophyllus*, *Bischofia javanica*, *Calophyllum polyanthum*, *Canarium strictum*, *Cullenia exarillata*, *Dipterocarpus indicus*, *Drypetes venusta*, *Dysoxylum malabaricum*, *Elaeocarpus tuberculatus*, *Mesua ferrea*, *Palaquim ellipticum*, *Persea macrantha* and *Vateria indica*. The second storey, which is about 15-25 m high, is comprised of *Aglaia elaeagnoidea*, *Baccaurea courtallensis*, *Cinnamomum malabathrum*, *Dimocarpus longan*, *Elaeocarpus serratus*, *Garcinia talbotii*, *Holigarna grahamii*, *Litsea wightiana*, *Myristica beddomei*, *Polyalthia coffeoides* and others. The third storey which is of less than 15 m in height consists of small trees like *Cinnamomum* spp., *Syzygium laetum*, *Syzygium munronii*, *Memecylon* sp., *Xanthophyllum arnottianum*, and also shrubs like *Lasianthus* sp., *Psychotria* sp., *Strobilanthes* sp., *Thottea siliquosa* et al.. Palms like *Arenga wightii*, *Calamus* sp., *Pinanga dicksonii* and reeds like *Ochlandra* sp., are common. The ground flora is sparse and represented by species like *Amomum* sp., *Hydrocotyle javanica*, *Elettaria cardamomum*, *Ophiorrhiza* spp, and species of *Begonia* and *Elatostemma*. Woody lianas are represented by *Caesalpinia cucullata*, *Entada rheedei*, *Gnetum edule*, *Derris scandens*, *Quisqualis malabarica*, *Combretum latifolium* etc. Epiphytes are represented by *Fagraea ceylanica*, various species of orchids, aroids and pteridophytes. Common parasites are members of Loranthaceae and Viscaceae.

About 22 sq km (34 %) of the forest is fairly undisturbed belonging to this type. The forest from Chavachi to Ambalappara is a good west coast tropical evergreen forest. *Dipterocarpus*, *Calophyllum* and *Palaquium* species dominate in Uruppukunnu. A good population of *Dipterocarpus bourdillonii*, a critically endangered tree species of Western Ghats, is seen in the Chavachi area of the Sanctuary. The evergreen forest has good representation of endemic wild plants such as *Arenga wightii* and *Pinanga dicksonii* and very good growth of *Calamus* spp.

4.2. West coast semi-evergreen forest

This forest type is found between 600 to 800 m elevation and in some areas descends to 500 m. Although it is a closed forest, unlike the evergreen, it is not so dense and the evergreen and deciduous species are mingled in the top storey. While the preponderance of evergreen species are more when they merge towards the wet evergreen type. In most of the localities *Dipterocarpus indicus* predominates in the top storey making the forest *Dipterocarpus* dominant. This gives the forest the status of a subtype of the major semi-evergreen type. Physiognomy of the top storey is a mixture of evergreen and deciduous species. The dominant evergreen species are *Artocarpus heterophyllus*, *Bischofia javanica*, *Calophyllum polyanthum*, *Hopea parviflora*, *Mangifera indica*, *Mesua ferrea*, *Myristica beddomei* etc. The deciduous ones are *Bombax ceiba*, *Dalbergia latifolia*, *Holigarna grahamii*, *Pterospermum diversifolium*, *Tetrameles nudiflora*, etc.

Areas like Valayamchal, Narikkadavu and Paripputhode, the forest is semi-evergreen type intermixed with a small patch of moist deciduous forests.

4.3. Southern moist mixed deciduous forest

This forest type is seen below 700 m altitude. During the rainy season due to the thick foliage, the canopy looks similar to that of evergreen forest. However, during dry season the moist deciduous forest reveal its true identity as the trees shed their leaves. The leafless period varies from two weeks to four months depending on the species. The principal species of this type of forest

are: *Albizia odoratissima*, *A. lebbeck*, *A. procera*, *Bombax ceiba*, *Briedelia retusa*, *Dalbergia latifolia*, *Grewia tiliifolia*, *Lagerstroemia microcarpa*, *L. speciosa*, *Schleichera oleosa*, *Terminalia paniculata*, *Terminalia bellirica*, *Tetrameles nudiflora* etc. The middle stratum trees are *Bauhinia racemosa*, *Cassia fistula*, *Careya arborea*, *Ficus exasperate*, *F. racemosa*, *Miliusa tomentosa*, *Olea dioica*, *Phyllanthus emblica*, *Sapindus trifoliatus*, etc. The woody climbers are *Acacia caesia*, *Calycopteris floribunda*, *Cissus heyneana*, *Spatholobus parviflorus* etc. are very common. The lower story is composed of species like *Cipadessa baccifera*, *Chionanthus mala-elengi*, *Holarrhena pubescens*, *Narengi crenulata*, *Hydnocarpus pentandra* etc.

4.4. Southern hill-top evergreen forest

This forest type is seen at an elevation between 1,200 and 1,500 m. The trees in this forest type is characterised by short-boled and highly branched and seldom exceed 20 m. There will be dense growth of mosses, lichens, aroids, orchids and ferns. The principal species are *Litsea wightiana*, *Calophyllum astro-indicum*, *Cinnamomum sulphuratum*, *Diospyros nilagirica*, *Elaeocarpus munronii*, *E. recurvatus*, *Gordonia obtusa*, *Garcinia* sp., *Ixora sivarajiana*, *Ligustrum robustum* ssp. *walkeri*, *Memecylon* sp., *Meliosma pinnata* ssp. *barbulata*, *Symplocos cochinchinensis* ssp. *laurina*, *Syzygium densiflorum*, *Pittosporum tetraspermum* *Atlantia wightii*, *Tarennia alpestris* etc.

4.5. Grasslands

The Grasslands in the Sanctuary are along the fringe areas bordering the Brahmagiri Hills. The common grasses and sedges are *Chrysopogon hackelli*, *Cymbopogon* spp., *Garnotia arundinacea*, *Themeda triandra*, *Fimbristylis* spp., *Pycnus* spp., *Carex* spp., *Cyperus* spp. etc. are common grasses. Apart from the grasses and sedges, the grasslands support several herbaceous and shrubby species such as *Eriocaulon* spp., *Habenaria* spp., *Hedyotis* spp., *Heracleum rigens*, *Hypericum mysurense*, *Impatiens* spp., *Ipomoea barlerioides*, *Knoxia wightiana*, *Oldenlandia* spp. *Pimpinella heyneana*, *Phoenix loureiroi*, *Striga asiatica*, *S. angustifolia*, *Swertia* spp., *Vernonia indica* etc.

4.6. Plantations

About 490 ha of area is covered by plantations, comprised of 291.30 ha teak, 167 ha Eucalyptus and 30 ha cashew. Eucalyptus and Cashew plantations are in an abandoned stage.

5. Method

5.1. Exploration and identification of plant species

Repeated collection trips were carried out in different seasons to all habitatas of the Sanctuary so as to collect all phanerogams from the study area in flowering and fruiting stage (Map 2). The collected specimens were made in to herbarium. Being a forest flora, care was taken to make it useful to the Forest Department Staff and other users as possible. Emphasis was be given to record field characters such as bole shape, bark colour, surface pattern, inner bark colour, exudation etc. of tree species. These field characters are of great help in the identification of tree in the field. The specimens were identified with the help of relevant literature and authentic herbarium collections available in the KFRI herbarium and MH herbarium, Coimbatore.

5.2. Status of Red listed category species

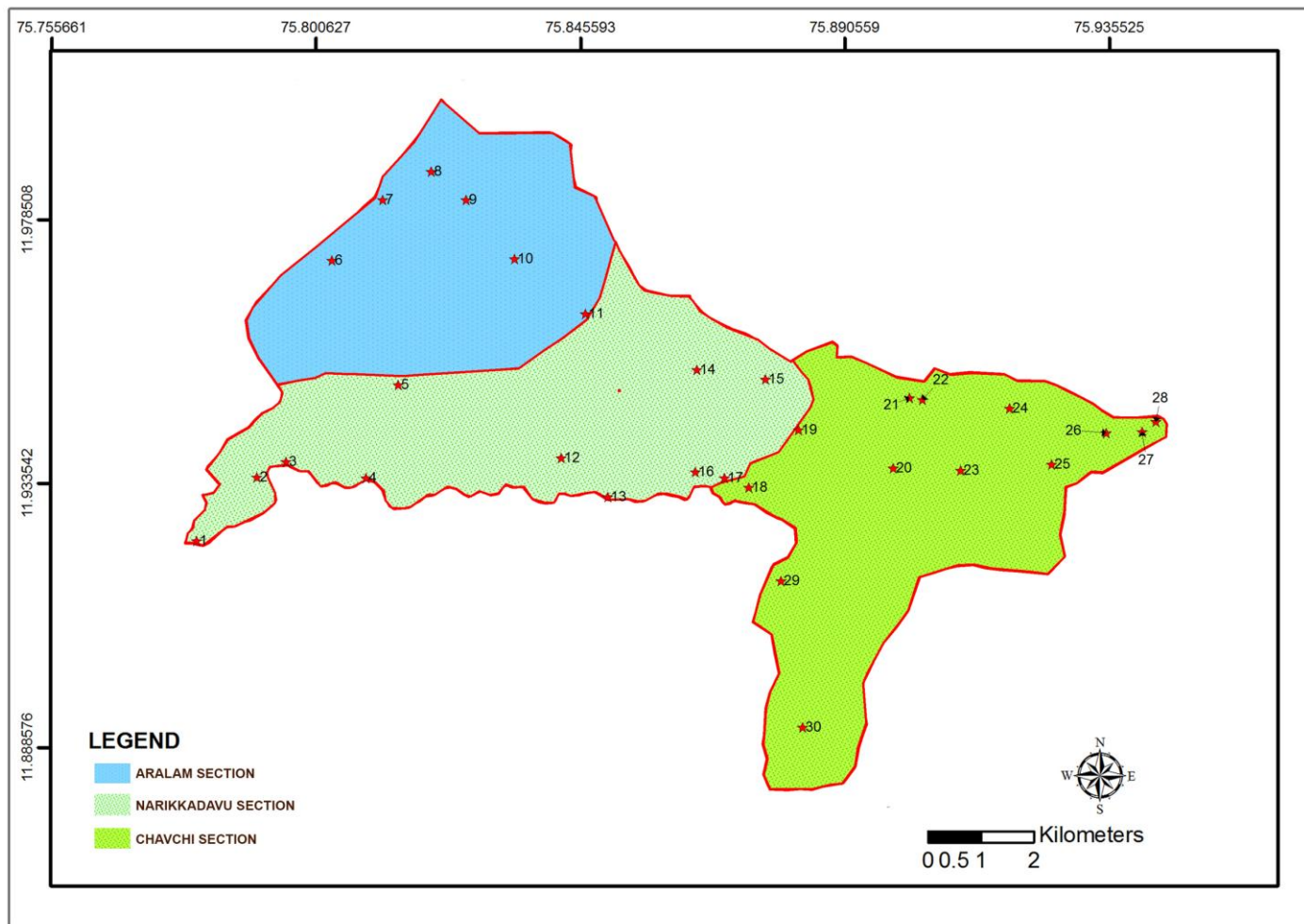
The population of Red listed category species was assessed and the status such as vulnerable, rare, endangered, critically endangered etc. ascertained as per IUCN criteria (IUCN, 2000).

5.3. Herbarium preparation

Collection and preparation of Herbarium specimens were done as per standard procedure (Santapau, 1955; Bridson & Forman, 1991). Reference herbarium specimens are maintained in the Kerala Forest Research Institute Herbarium (KFRI).

5.4. Format of the Flora

Families are arranged according to the classification system of Bentham and Hooker (1862-83) with necessary modifications in accordance with their



Map 2. Different Collection Localities and Sections. **1.** Valayamchal, **2.** Pookundu, **3.** Checkdam, Pookund, **4.** Narikadavu, **5.** Uruppukunnu, **6.** Paripode, **7.** 55_block, **8.** Pottichapara, **9.** Kurumbankallu, **10.** Kannadivechakunnu 1, **11.** Kannadivechakunnu2, **12.** Pothanplavu, **13.** Kariyankappu, **14.** Meenmutti, **15.** Meenmutti Vellachatam, **16.** Crossway, **17.** Chelachuvadu, **18.** Chavachi 1, **19.** Moonamthode, **20.** Chavachi vellachatam, **21.** Kattikari 2, **22.** Kattikari 1, **23.** Chavachi 2, **24.** Mullenpara, **25.** Pothurumi, **26.** Astippara, **27.** Ambalappara Tower, **28.** Ambalappara, **29.** Kolithat, **30.** Santhagiri

current status. Dichotomous parallel keys are provided for the identification of families, genera under families and species under genera. Under the families, the genera and species are arranged alphabetically. The correct and up to date name of the species is followed by basionym, if any, and important synonyms. Exhaustive citations of floras have been avoided and restricted to Wight (1838-53), Hooker (1872-97), Gamble (1915-36) , and floras of adjacent areas like Calicut (Manilal & Sivarajan, 1982), Kasaragod (Ansari, 1985), Cannanore (Ramachandran & V J Nair, 1988), Wayanad (Ratheesh Narayan, 2009) and recent revisions and monographs. A brief diagnostic description is followed by flowering, fruiting period and distribution data. The collection number(s) of the specimens studied were also cited. All the specimens are lodged in KFRI Herbarium (KFRI), otherwise mentioned.

6. Results

6.1. Floristic analysis

During the study, 1,005 species of flowering plants belonging to 597 genera under 128 families and two sub families were collected and described. Dicotyledons have 818 species belonging to 476 genera under 108 families and 2 sub families. Monocotyledons are represented by 186 species in 120 genera under 19 families. Gymnosperm is represented with single family and single species (Table 1 & Figure 1). Fabaceae with 83 species in 44 genera is largest family in the Sanctuary. Rubiaceae with 59 species in 30 genera come next. Likewise Euphorbiaceae 55 (29), Orchidaceae 49 (35), Acanthaceae 40 (16), Asteraceae 36 (26), Poaceae 36 (30), Lamiaceae 26 (14), Cyperaceae 24 (8), Commelinaceae 23 (7) are coming rest of the 10 largest positions in the study area (Figure 2). Twenty four dicot families, 4 monocot families and 1 gymnosperm family are represented with only single species. The genera *Strobilanthes* and *Impatiens* have maximum number of species with 12. *Desmodium* with 10 species, *Syzygium* with 9, *Cyperus* and *Murdannia* with 8 species each come the first five positions. Four hundred and one genera are represented with only single species.

Decalepis nervosa, *Impatiens stocksii*, *I. lawsonii*, *I. fasciculata*, *Cyanotis thwaitesii*, *C. obtusa*, and *Eugenia codyensis* are new additions to flora of

Kerala from the Sanctuary. Out of 1,005 plants recorded, 247 are new report to the flora of Kannur District. *Lepidagathis keralensis* Madhu. & Singh, *Pogostemon peethapushpum* Pradeep, *Orophea sivarajanii* Sasidh., *Miliusa wayanadica* Sujanapal, Ratheesh & Sasidh., *Impatiens veerapazhasii* Ratheesh, Sujanapal & Meera and *Combretum recurvatum* Sujana, Ratheesh & Anil, new species recently described from northern Kerala are also collected from the Sanctuary.

Table 1. General statistics of Flora

	Dicotyledons	Monocotyledons	Gymnosperms	Total
Families	108	19	1	128
Genera	476	120	1	597
Species	818	186	1	1,005

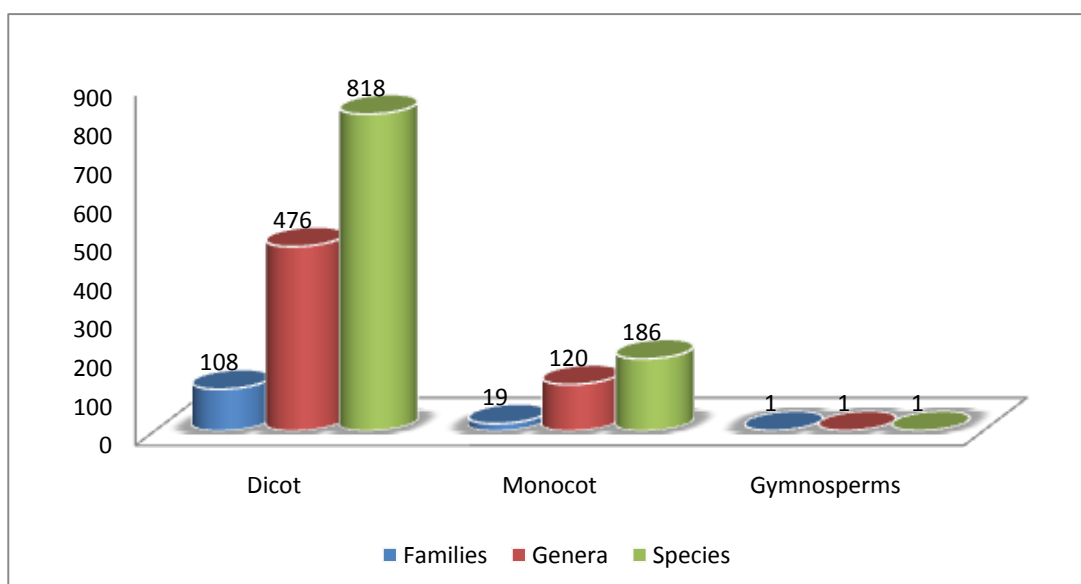


Figure 1: Chart showing Species distribution in Sanctuary

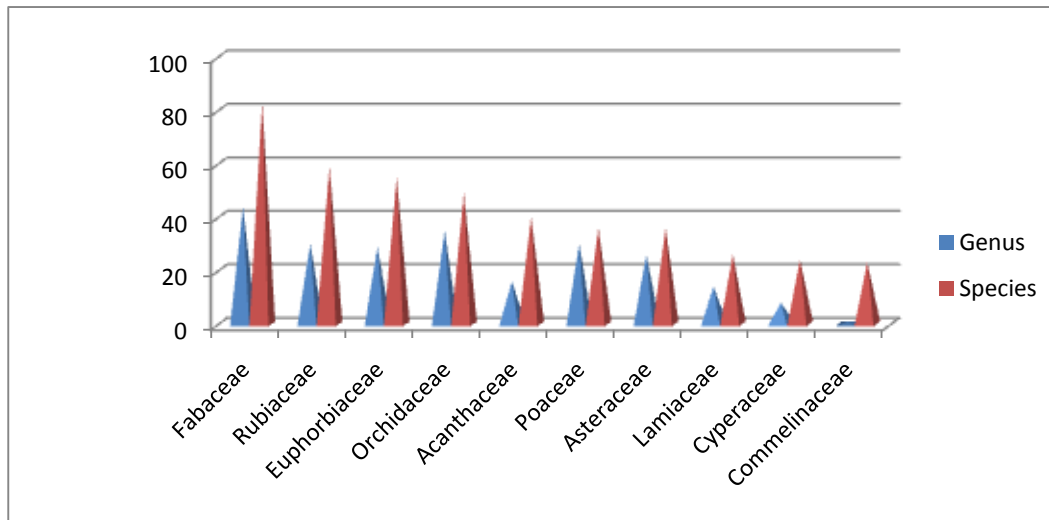


Figure 2: Chart showing 10 Major families in the Sanctuary

6.2. Comparisons

Fabaceae comprising three sub families is the largest family in Kerala. Poaceae, Orchidaceae, Rubiaceae and Asteraceae occupy the next positions of largest families in Kerala. In the Sanctuary also Fabaceae is the largest family, followed by Euphorbiaceae, Rubiaceae, Orchidaceae and Acanthaceae.

Compared with the flora of adjacent districts, the family Fabaceae rank first position. Same pattern is found in the different protective areas of Nilgiri Biosphere reserve (NBR) except Silent Valley, where the family Orchidaceae has maximum diversity. In all the other areas, Poaceae occupy 2nd or 3rd positions but in the Sanctuary it goes to 6th. This is may be due to the dense tree cover in the Sanctuary. Major portion of the Sanctuary is covered by evergreen forests. Open areas are comparatively low and the Sanctuary has no typical Grasslands, only the fringe area is with Grasslands. Other large families of Kerala and NBR like Orchidaceae, Rubiaceae, Euphorbiaceae, Asteraceae, Cyperaceae and Acanthaceae are fairly well represented in Sanctuary.

6.3. Endemism and restricted Distribution

Western Ghats are one of the global hot spot and well known for its high percentage of endemism. Nearly 5,800 species belongs to 2,200 genera of 217

families are in the Western Ghats. About 35% are endemic to this region. Aralam Wildlife Sanctuary falls within the Nilgiri-Silent Valley-Wayanad-Kodagu endemic centre in Southern Western Ghats. (Ahmedullah and Nayar, 1987). Out of the 1,005 species recorded from the Sanctuary, 274 are endemic to the Peninsular India and 135 among them restricted to the Southern western Ghats (Figure 3).

In Kerala Rubiaceae rank the first in the number of endemic species. In Aralam also Rubiaceae with 28 endemics comes in the first position of endemics. Rest of the families with more number of endemics are Acanthaceae (20), Orchidaceae (17), Euphorbiaceae (15), Lauraceae (14), and Fabaceae (13). *Ophiorrhiza barberi* endemic and restricted to the Agasthyamala and Pulney Hills of southern Western Ghats is now collected from the Sanctuary. *Campbellia cytinoides*, *Christisonia bicolor*, *Discospermum apiocarpum*, *Eriocaulon thwaitesii*, *Impatiens goughii*, *I. hensloviana*, *Ipomoea barlerioides*, *Nothopegia monadelphica*, *Paspalum canarae*, *Piper argyrophyllum*, *P. wightii*, *Psychotria bisulcata*, *Symplocos macrophylla* and *Cinnamomum perrottetii* were reported from the Nilgiris by Gamble (1915-1936) and Hooker (1872-1897). But these species were not collected during the recent floristic studies in the Nilagiri region of Kerala. The present collection of these species from the Sanctuary is new record of occurrence north to Palakkad Gap. *Psychotria dalzelli*, distributed in the Carnatic and Northern and Central Western Ghats, is also collected from the Sanctuary. *Tragia montana*, is reported to be distributed from Wayanad to Cochin. However, it has not been recollected from the region north of Palakkad Gap. *Impatiens lawsonii* and *I. stocksii* two scapigerous species believed to be distributed in Western Ghats of Karnataka (Bhaskar, 2012) are now collected from the Sanctuary.

Among the 50 endemic genera in India, 38 are restricted to the Western Ghats. Out of 38 genera, 31 are monotypic. (Sheeba *et al*, 2011.) Monotypic genera such as *Adenoon*, *Blepharistemma*, *Helicanthes*, *Indobanalia*, *Jerdonia*, *Otonephidium*, *Poeciloneuron* and *Molluava* are occurring in the Aralam wildlife Sanctuary. Apart from these, endemic genera like *Anaphyllum*, *Decalepis* and *Haplanthodes* are also present in the Sanctuary.

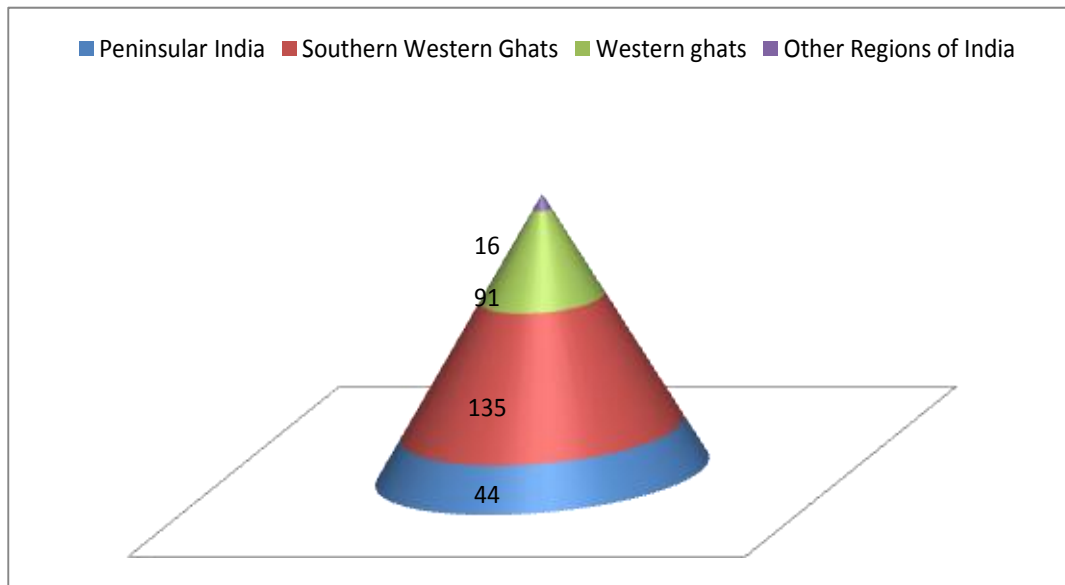


Figure 3. Chart showing endemism in different Regions of India

6.4. Threatened Plants

During the present study, 59 species placed under various threat categories were collected from the Sanctuary (Table 2 & Figure 4). Among these *Allophylus concanicus*, *Dipterocarpus bourdillonii* and *Hopea erosa* are Critically Endangered. *D. bourdillonii* has a good population in the Chavachi section. *Allophylus concanicus* is well distributed in the Narikadvu and Chavchi sections. *Hopea erosa* is rarely seen in Chavchi section.

Table 2. List of Threatened Taxa

Species	Family	Status
<i>Hopea erosa</i>	Dipterocarpaceae	Critically Endangered
<i>Dipterocarpus bourdillonii</i>	Dipterocarpaceae	Critically Endangered
<i>Allophylus concanicus</i>	Sapindaceae	Critically Endangered
<i>Cyclea fissicalyx</i>	Menispermaceae	Endangered
<i>Grewia gamblei</i>	Tiliaceae	Endangered
<i>Vepris bilocularis</i>	Rutaceae	Endangered

<i>Holigarna beddomei</i>	Anacardiaceae	Endangered
<i>Kingiodendron pinnatum</i>	Caesalpiniaceae	Endangered
<i>Lasianthus capitulatus</i>	Rubiaceae	Endangered
<i>Ophiorrhiza barberi</i>	Rubiaceae	Endangered
<i>Pogostemon gardneri</i>	Lamiaceae	Endangered
<i>Actinodaphne salicina</i>	Lauraceae	Endangered
<i>Beilschmiedia wightii</i>	Lauraceae	Endangered
<i>Taeniophyllum scaberulum</i>	Orchidaceae	Endangered
<i>Dictyospermum ovalifolium</i>	Commelinaceae	Endangered
<i>Casearia wynadensis</i>	Flacourtiaceae	Vulnerable
<i>Dipterocarpus indicus</i>	Dipterocarpaceae	Vulnerable
<i>Hopea parviflora</i>	Dipterocarpaceae	Vulnerable
<i>Hopea ponga</i>	Dipterocarpaceae	Vulnerable
<i>Elaeocarpus recurvatus</i>	Elaeocarpaceae	Vulnerable
<i>Impatiens herbicola</i>	Balsaminaceae	Vulnerable
<i>Aglaiia barberi</i>	Meliaceae	Vulnerable
<i>Miquelia dentata</i>	Icacinaceae	Vulnerable
<i>Salacia malabarica</i>	Hippocrateaceae	Vulnerable
<i>Holigarna grahamii</i>	Anacardiaceae	Vulnerable
<i>Saraca asoca</i>	Fabaceae	Vulnerable
<i>Blepharistemma serratum</i>	Rhizophoraceae	Vulnerable
<i>Syzygium densiflorum</i>	Myrtaceae	Vulnerable
<i>Memecylon lawsonii</i>	Melastomataceae	Vulnerable
<i>Begonia trichocarpa</i>	Begoniaceae	Vulnerable
<i>Ixora malabarica</i>	Rubiaceae	Vulnerable
<i>Lasianthus jackianus</i>	Rubiaceae	Vulnerable
<i>Mycetia acuminata</i>	Rubiaceae	Vulnerable

<i>Ochreinauclea missionis</i>	Rubiaceae	Vulnerable
<i>Saprosma fragrans</i>	Rubiaceae	Vulnerable
<i>Tarenna nilagirica</i>	Rubiaceae	Vulnerable
<i>Anaphalis neelgerryana</i>	Asteraceae	Vulnerable
<i>Ceropegia metziana</i>	Asclepiadaceae	Vulnerable
<i>Marsdenia raziana</i>	Asclepiadaceae	Vulnerable
<i>Toxocarpus palghatensis</i>	Asclepiadaceae	Vulnerable
<i>Swertia beddomei</i>	Gentianaceae	Vulnerable
<i>Strobilanthes aurita</i>	Acanthaceae	Vulnerable
<i>Myristica malabarica</i>	Myristicaceae	Vulnerable
<i>Actinodaphne malabarica</i>	Lauraceae	Vulnerable
<i>Cinnamomum perrottetii</i>	Lauraceae	Vulnerable
<i>Cinnamomum riparium</i>	Lauraceae	Vulnerable
<i>Cryptocarya beddomei</i>	Lauraceae	Vulnerable
<i>Drypetes confertiflora</i>	Euphorbiaceae	Vulnerable
<i>Glochidion hohenackeri</i>	Euphorbiaceae	Vulnerable
<i>Eria albiflora</i>	Orchiadaceae	Vulnerable
<i>Belosynapsis vivipara</i>	Commelinaceae	Vulnerable
<i>Murdannia lanuginosa</i>	Commelinaceae	Vulnerable
<i>Arenga wightii</i>	Arecaceae	Vulnerable
<i>Neanotis monosperma</i>	Rubiaceae	Near Threatened
<i>Elaeocarpus munronii</i>	Elaeocarpaceae	Near Threatened
<i>Anaphyllum wightii</i>	Araceae	Near Threatened
<i>Arisaema barnesii</i>	Araceae	Near Threatened
<i>Tabernaemontana alternifolia</i>	Apocynaceae	Near Threatened

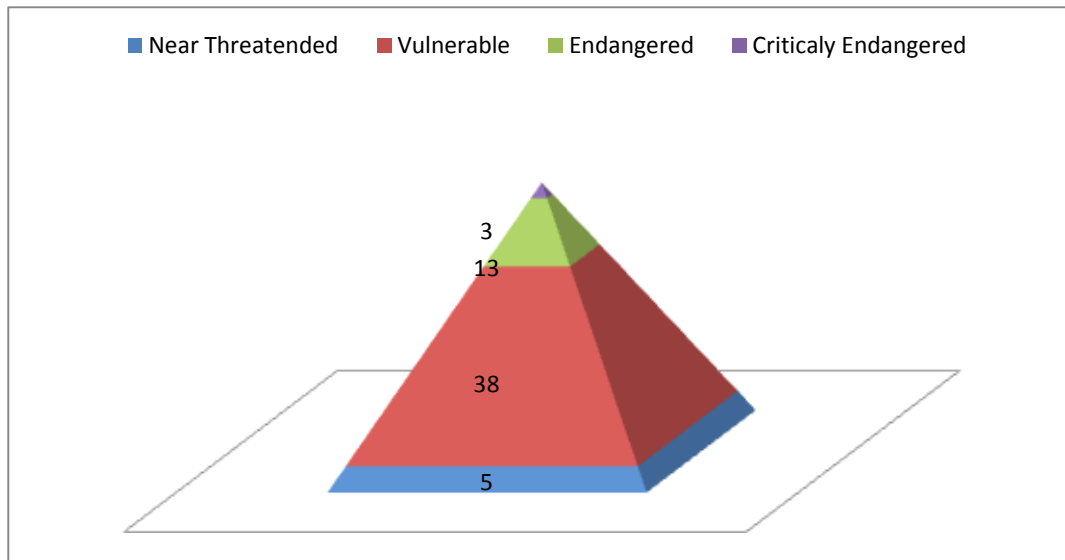


Figure 4: Chart Showing IUCN Category Plants

6.5. Weeds and cultivated Plants

As many as 52 species in the Sanctuary are considered as weeds. Most of the weeds are occurring along the fringe areas of the Sanctuary due to human intractions. *Chromolanea ododrata* and *Mikania micrantha* are the major invasive weeds in the Sanctuary. Both of them are common in the plantations. In the natural forest the occurrence of invasive species is less. In the earlier settlements there are 20 species, mostly cultivated or planted. Some fruit species were planted by the Forest department as a part of afforestation programmes.

7. Discussion and conclusion

Aralam is small area compared to other protective areas of Kerala. It has only 55 sq. km area and half of the Sanctuary are vested forest and was subjected to irrational felling. Nearly 25 sq. km are of undistrurbed forest. In 1988 Ramachandran and V J Nair studied the Flora of Cannanore District. Their study area included some areas of the present Wayanad district and the total area covered was 3,670 sq. km. In the Flora of Cannanore District only 1,132 species were described. The present study describes 1,005 species. Among

them 247 species are new additions to Kannur district. This shows the diversity of study area.

The Aralam Sanctuary has good diversity, particularly in the Evergreen and Semi- Evergreen forests. The important association is *Dipterocarpus- Palaquim* – *Mesua*, this type of association is very few in Kerala. Besides this, *Dipterocarpos* - *Calophyllum* – *Palaquim*; *Mesua* – *Artocarpus* - *Hopea* associations are also seen. The diversity of epiphytes is relatively very high, especially in the forests above 700 m elevation. Orchids, lichens, mosses are well distributed in the evergreen forests. The occurrence *Dipterocarpus bourdillonii*, a critically endangered tree in the Sanctuary is interesting. This is the only area with distribution of *D. bourdillonii* in Kerala north to Plakkad Gap.

Ambalappara is the highest peak of the Sanctuary. The vegetation is Hilltop tropical evergreen forests. There is dominance of members of the families Lauraceae and Myrtaceae, along with *Calophyllum astro-indicum*, *Diospyros nilagirica*, *Elaeocarpus munronii*, *E. recurvatus*, *Gordonia obtusa*, *Garcinia gummi-gutta var. papilla*, *Ixora sivarajiana*, *Ligustrum gamblei*, *Memecylon sp.*, *Meliosma pinnata ssp. barbulata*, *Symplocos cochinchinensis ssp. laurina* etc. But the small area shows a distinctive growth pattern. Ambalappara- Pothurumi area has rich diversity of plants. Over 300 the species collected, 190 are exclusive to this area in the Sanctuary. The number of species collected from different Sections of the Sanctuary are 712 species (Chavachi); 621 (Narikadvu) and 390 (Aralam) [Figure 5]. The higher diversity in the Chavachi is because of the undisturbed Evergreen forests and also Ambalappara-pothurumni area falls in this Section.

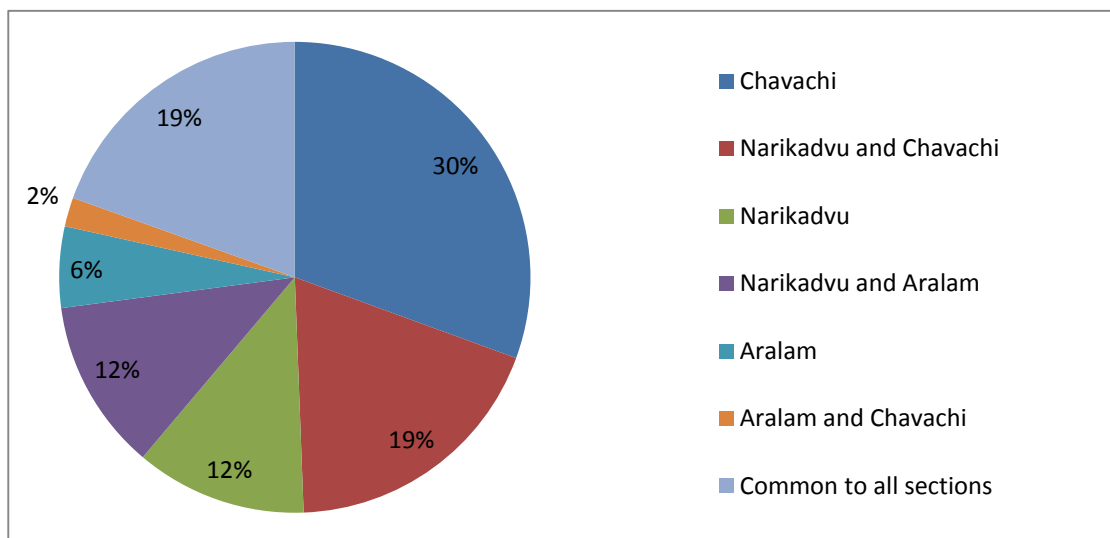


Figure 5: Chart Showing Distribution of Species among Three different sections of Sanctuary

All the five arboreal primates of Kerala are occurring in the Sanctuary. Fruits of Anjili, Jack fruit, Mango, Mullenchaka, Mootilpazham, different species of *Garcinia*, *Syzygium*, *Eugenia*, *Palquium*, *Ficus*, *Salacia*, Cucurbitaceae members etc are eaten by arboreal mammals and birds. Elephants are the large animals in the Sanctuary. The Sanctuary is well represented with good number of Reptiles and Amphibians. The birds in the Sanctuary are also well represented. Ambalappara (1500 m) is the highest peak in the Sanctuary but many birds usually found above 1,800 m are seen here. Beside Ambalappara, other Sanctuary areas also support good bird populations.

Aralam is the main watershed area of Cheenkani puzha one of the main tributary of Valapatanam River which is the main water resource of Kannur revenue district. Cheenkani puzha has a key roll in enriching the water level in Valapatanam River.

Only Spermatophytes in the Sanctuary were subjected to detailed study. The diversity among lower groups of plants is much higher, so detailed studies are needed to know the richness of the plant diversity. Quantitative studies are needed to ascertain the population status of the 59 threatened species as well as the 286 endemic plants for their conservation.



1. Cyanotis obtusa



2. Cyanotis thwaitesii



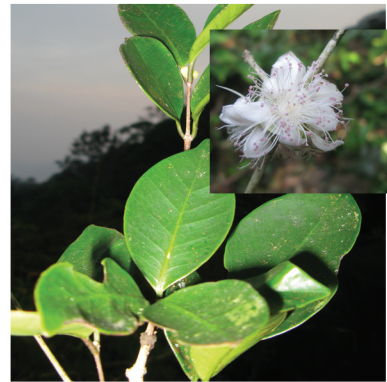
3. Impatiens lawsonii



4. Impatiens fasciculata



5. Impatiens stocksii



6. Eugenia codyensis



7. Impatiens veerapazhasii



8. Ixora sivarajiana



9. Lepidagathis keralensis



10. Miliusa wayanadica



11. Orophea sivarajanii



12. Pogostemon peethapushpam

Plate 1. Addition to the Flora of Kerala (1-6) and new collection locality for recently described plants (7-12)



Actinodaphne salicina



Allophylus concanicus



Beilschmiedia wightii



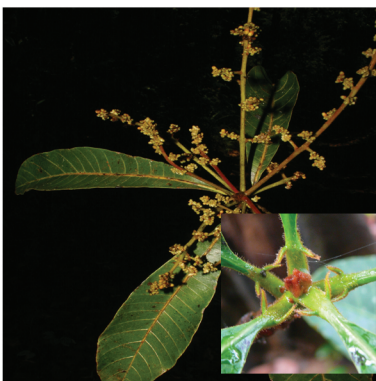
Cyclea fissicalyx



Dictyospermum ovalifolium



Grewia gamblei



Holigarna beddomei



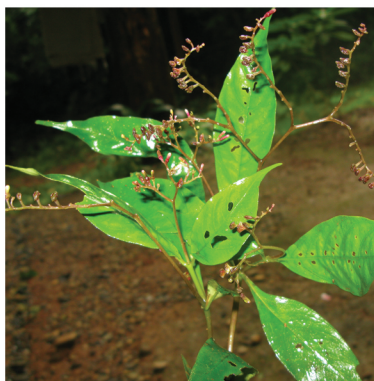
Hopea erosa



Kingiodendron pinnatum



Lasianthus capitulatus



Ophiorrhiza barberi



Pogostemon gardneri

Plate 2. Endangered category plants



Adenoon indicum



Archidendron monadelphum var. gracile



Argostemma verticillatum



Balanophora abbreviata



Bulbophyllum acutiflorum



Campbellia neilgherrica



Cheirostylis parvifolia



Christisonia bicolor



Cyanotis racemosa



Dendrobium nutans



Discospermum apiocarpum



Elatostema wightii



Garcinia talbotii



Glochidion hohenackeri var. johnstonei



Impatiens jerdoniae



Leucas eriostoma var. eriostoma



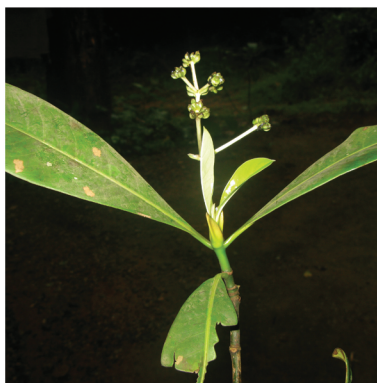
Micrococca beddomei



Osyris quadripartita



Paracroton integrifolius



Psychotria dalzellii



Salacia malabarica



Saprosmia fragrans



Sauropus gour-maitii



Schefflera roxburghii



Sopubia trifida



Strobilanthes cuspidatus



Strobilanthes ixiocephalus



Strobilanthes lupulinus



Strychnos dalzellii var. dalzellii



Syzygium munronii



Tarena alpestris



Teucrium tomentosum



Toxocarpus palghatensis



Trichosanthes lobata



Vernonia ornata



Zeuxine affinis

8. Systematic Treatment

KEY TO THE FAMILIES OF VASCULAR PLANTS

- 1a. Ovules enclosed with in carpels; stigma present..... **Angiosperms**
- 1b. Ovules not enclosed with in carpels; stigma absent..... **Gnetaceae**

ANGIOSPERMS

- 1a. Plants with tap root system; cotyledons two; leaves with reticulate venation..... **Dicotyledons**
- 1b. Plants with fibrous root system; cotyledons one; leaves usually with parallel venation **Monocotyledons**

DICOTYLEDONS

- 1a. Flowers without or with one whorl of perianth **Monochlamydeae**
- 1b. Flowers with two or more whorls of perianth 2
- 2a. Inner whorl of perianth free; stamens free from petals **Polypetalae**
- 2b. nner whorl of perianth united or connate below; stamens epipetalous **Gamopetalae**

Polypetalae

- 1a. Ovary inferior 2
- 1b. Ovary superior or half inferior 11
- 2a. Petiole sheathing at base 3
- 2b. Petiole not sheathing at base 4
- 3a. Herbs or subshrubs; fruit a cremocarp..... **Apiaceae**
- 3b. Shrubs or trees; fruit a drupe **Araliaceae**
- 4a. Flowers unisexual..... 5
- 4b. Flowers bisexual..... 7
- 5a. Tendril climbers **Cucurbitaceae**
- 5b. Erect herbs, shrubs or trees 6
- 6a. Herbs or subshrubs..... **Begoniaceae**
- 6b. Trees **Datisceae**
- 7a. Stamens more than 15 8
- 7b. Stamens less than 12 9
- 8a. Leaves opposite or subopposite with intramarginal nerves and pellucid glands **Myrtaceae**
- 8b. Leaves alternate without intramarginal nerves and pellucid glands **Lecythidaceae**
- 9a. Fruit linear or angular **Onagraceae**
- 9b. Fruit otherwise 10

10a. Fruit a berry.....	Alangiaceae
10b. Fruit a drupe.....	Combretaceae
11a. Carpels free or ovary one celled without hypanthium.....	12
11b. Ovary 2 or more celled rarely one celled with hypanthium	33
12a. Leaves with insectivorous sticky glands.....	Droseraceae
12b. Leaves without insectivorous sticky glands.....	13
13a. Fruit a legume.....	Fabaceae
13b. Fruit otherwise	14
14a. Leaves with sheathing petiolar base	Dilleniaceae
14b. Leaves without sheathing petiolar base	15
15a. Gynandrophore or gynophore present, sometimes gynophore reduced	16
15b. Gynandrophore or gynophore absent	17
16a. Tendril climbers	Passifloraceae
16b. Plants otherwise	Capparaceae
17a. Carpels free	18
17b. Carpels united or slightly connate below	21
18a. Trees or woody climbers; fruits aggregate of berries	Annonaceae
18b. Herbs, Shrubs or herbaceous climbers; fruits achenes or capsules	19
19a. Flowers grouped, fruits achenes; climbers	Ranunculaceae
19b. Flowers solitary, fruits capsules; herbs or shrubs.....	20
20a. Fruit indehiscent.....	Parnassiaceae
20b. Capsules 3-valved.....	Violaceae
21a. Ovule one.....	22
21b. Ovules two or more.....	24
22a. Plants dioecious; flowers unisexual	Menispermaceae
22b. Plants monoecious; flowers bisexual, rarely unisexual	22
23a. Trees	Anacardiaceae
23b. Climbing shrubs.....	Ancistrocladaceae
24a. Fruit dehiscence circumscissile.....	Portulacaceae
24b. Fruit dehiscence otherwise	25
25a. Leaves very fleshy.....	Crassulaceae
25b. Leaves otherwise	26
26a. Tendril climbers	Erythropalaceae
26b. Plants otherwise	27
27a. Erect or prostrate herbs or bushy subshrubs	Hypericaceae
27b. Trees, shrubs or climbers	28
28a. Disc embracing the base of the ovary	Olaceae
28b. Disc absent or not embracing the ovary, rarely cup shaped	29
29a. Disc lining the calyx tube or form a ring at its base	Rosaceae
29b. Disc neither lining the tube nor forming a ring at its base.....	30
30a. Leaves compound	Connaraceae
30b. Leaves simple	31

31a. Sepals free; fruit pungent smelling.....	Pittosporaceae
31b. Sepals absent or variously connate at base; fruit not pungent smelling.....	32
32a. Fruit a drupe.....	Icacinaceae
32b. Fruit a berry or capsule.....	Flacourtiaceae
33a. Lower sepal spurred.....	Balsaminaceae
33b. Lower sepal not spurred.....	34
34a. Leaves gland-dotted.....	Rutaceae
34b. Leaves not gland-dotted.....	35
35a. Petals laciniate.....	Elaeocarpaceae
35b. Petals not laciniate.....	36
36a. Seeds embedded in cottony wool or fruit large and echinate.....	Bombacaceae
36b. Seeds not embedded in cottony wool; fruit not echinate, rarely bristly.....	37
37a. Climbers with axillary or leaf opposed tendrils.....	Vitaceae
37b. Plants without tendrils, rarely with tendrils from inflorescence.....	38
38a. Sepals accrescent into wings or woody and reflexed in fruit.....	Dipterocarpaceae
38b. Sepals not accrescent into wings or woody reflexed in fruit.....	39
39a. Leaves opposite, subopposite or whorled, if alternate seeds red arillate.....	40
39b. Leaves alternate.....	48
40a. Petals absent, calyx free.....	Molluginaceae
40b. Petals present, rarely absent when calyx tubular.....	41
41a. Calyx tubular.....	42
41b. Calyx free or partially united.....	44
42a. Petals lacerate at apex.....	Rhizophoraceae
42b. Petals entire.....	42
43a. Calyx lobes imbricate.....	Melastomataceae
43b. Calyx lobes valvate.....	Lythraceae
44a. Disc absent or inconspicuous.....	45
44b. Disc very prominent.....	46
45a. Trees, fruits berry.....	Clusiaceae
45b. Woody climbers, Fruits capsule.....	Linaceae
46a. Stamens three.....	Hippocrateaceae
46b. Stamens four or more.....	47
47a. Fruit a berry.....	Aquifoliaceae
47b. Fruit a capsule.....	Celastraceae
48a. Staminal filaments united into a staminal tube.....	49
48b. Staminal filaments free or partially united at base.....	54
49a. Stipule large, foliaceous.....	Leeaceae
49b. Stipule small, not foliaceous or absent.....	50
50a. Seeds carunculate.....	Polygalaceae
50b. Seeds not carunculate.....	51

51a. Petals with double ligule inside	Erythroxylaceae
51b. Petals without double ligule inside	52
52a. Anthers one celled	Malvaceae
52b. Anthers two celled	53
53a. Leaves simple; stipules present	Sterculiaceae
53b. Leaves compound rarely simple when stipules absent	Meliaceae
54a. Stigma punctiform.....	Sabiaceae
54b. Stigma otherwise	55
55a. Leaves simple or variously lobed	56
55b. Leaves compound	60
56a. Stamens to six.....	57
56b. Stamens ten or more	59
57a. Prostrate or erect herbs	Brassicaceae
57b. Shrubs, trees or woody climbers	58
58a. Stamens opposite to petals	Rhamnaceae
58b. Stamens alternate to petals	Dichapetalaceae
59a. Stamens inserted on torus	Tiliaceae
59b. Stamens not inserted on torus, adnate to petals at base	Theaceae
60a. Flowers in peduncled umbels.....	Oxalidaceae
60b. Flowers in racemes or panicles	61
61a. Disc cupular.....	Burseraceae
61b. Disc tumid or annular	62
62a. Disc tumid; exstipulate.....	Sapindaceae
62b. Disc annular; stipulate	Staphyleaceae

Gamopetalae

1a. Petals connate at base only.....	Symplocaceae
1b. Petals united	2
2a. Scapigerous plants with insectivorous bladders.....	Lentibulariaceae
2b. Non-scapigerous plants without insectivorous bladders	3
3a. Leafless root parasites	Orobanchaceae
3b. Plants otherwise	4
4a. Anthers connate with stigma; corona present	5
4b. Anthers otherwise; corona absent	6
5a. Pollen masses granular, contained in a spatulate appendices	Periplocaceae
5b. Pollen masses not granular, contained in a soft pollen carrier or pendulous	Asclepiadaceae
6a. Ovary inferior	7
6b. Ovary superior or half inferior	11

7a. Inflorescence a head	Asteraceae
7b. Flowers single or inflorescence other than a head	8
8a. Stipules present	Rubiaceae
8b. Stipules absent.....	9
9a. Leaves pinnatifid or pinnate.....	Valerianaceae
9b. Leaves simple	10
10a. Fruits a 2-valved capsule	Lobeliaceae
10b. Fruits a berry	Vacciniaceae
11a. Carpels more than two.....	12
11b. Carpels two	14
12a. Ovary 1-celled	Myrsinaceae
12b. Ovary 2 or more celled	12
13a. Plants with milky exudates; flowers bisexual	Sapotaceae
13b. Plants without milky exudates; flowers unisexual.....	Ebenaceae
14a. Corolla regular, if irregular, calyx regular or with leafy bract.....	15
14b. Corolla irregular, if regular, calyx irregular or with accrescent bract	21
15a. Leaves opposite	16
15b. Leaves alternate	19
16a. Plants with milky latex	Apocynaceae
16b. Plants without milky latex	17
17a. Stamens two	Oleaceae
17b. Stamens four or more, rarely three sterile	18
18a. Annual herbs; flowers in dichasioid cymes	Gentianaceae
18b. Plants otherwise; if herbs, flowers solitary or in fascicles	Loganiaceae
19a. Ovules and seeds less than four.....	20
19b. Ovules and seeds many	Solanaceae
20a. Twining plants; fruit capsular	Convolvulaceae
20b. Erect or procumbent plants; fruit drupe or of nutlets	Boraginaceae
21a. Fruit elastically dehiscent.....	Acanthaceae
21b. Fruit dehiscence otherwise	22
22a. Ovules and seeds less than five.....	23
22b. Ovules and seeds more than five.....	24
23a. Ovary 4-partite or lobed; fruit nutlets.....	Lamiaceae
23b. Ovary entire; fruit drupe or pyrenes	Verbenaceae
24a. Leaves compound; seeds winged	Bignoniaceae
24b. Leaves simple rarely lobed; seeds not winged	25
25a. Ovary one celled	Gesneriaceae
25b. Ovary two or more celled.....	26
26a. Fruit horned; placenta not swollen.....	Pedaliaceae
26b. Fruit not horned; placenta swollen.....	Scrophulariaceae

Monochlamydeae

1a. Thalloid aquatic herbs	Podostemaceae
1b. Plants otherwise	2
2a. Parasites or semiparasites	3
2b. Autophytes	5
3a. Achlorophyllous root parasites	Balanophoraceae
3b. Chlorophyllous semi-stem parasites	4
4a. Flowers bisexual	Loranthaceae
4b. Flowers unisexual	Viscaceae
5a. Flowers without perianth	Piperaceae
5b. Flowers with perianth	6
6a. Leaves and young shoots with silvery scales	Elaeagnaceae
6b. Leaves and young shoots without silvery scales	7
7a. Ovary inferior	8
7b. Ovary superior	10
8a. Trees	Santalaceae
8b. Herbs, shrubs or twiners	9
9a. Fruits with sticky glandular hairs	Nyctaginaceae
9b. Fruits without sticky glandular hairs	Aristolochiaceae
10a. Ovary 2 or more celled or imperfectly 2-celled	11
10b. Ovary one celled	12
11a. Male flowers without perianth	Daphniphyllaceae
11b. Male flowers with perianth	Euphorbiaceae
12a. Leaves with ochrea	Polygonaceae
12b. Leaves without ochrea	13
13a. Stamens and staminodes united at base	14
13b. Stamens and staminodes free at base	15
14a. Trees	Myristicaceae
14b. Herbs or subshrubs	Amaranthaceae
15a. Stamens in two or more whorls	Lauraceae
15b. Stamen solitary or in single whorl	16
16a. Male flowers in globose, oblong or flat receptacle or in synchonia	Moraceae
16b. Male flowers not in globose, oblong or flat receptacle or in synchonia	17
17a. Filaments erect in bud	Ulmaceae
17b. Filaments inflexed in bud	Urticaceae

MONOCOTYLEDONS

1a. Leaf venation reticulate.....	2
1b. Leaf venation parallel.....	4
2a. Plants with tendrils; inflorescence umbellate	Smilacaceae
2b. Plants without tendrils; inflorescence otherwise	3
3a. Inflorescence a spadix.....	Araceae
3b. Inflorescence otherwise.....	Dioscoreaceae
4a. Ovary superior	5
4b. Ovary inferior	13
5a. Fruit a caryopsis	Poaceae
5b. Fruit otherwise	6
6a. Inflorescence a spadix.....	7
6b. Inflorescence otherwise.....	8
7a. Leaves simple, margin spiny	Pandanaceae
7b. Leaves compound, leaflet margins not spiny.....	Arecaceae
8a. Perianth lobes sepaloid.....	9
8b. Perianth lobes petaloid	12
9a. Inflorescence a head	Eriocaulaceae
9b. Inflorescence otherwise.....	10
10a. Perianth lobe tubular.....	Najadaceae
10b. Perianth lobe not tubular.....	11
11a. Tepals modified in to glumes.....	Cyperaceae
11b. Tepals not modified in to glumes.....	Juncaceae
12a. Perianth lobes dissimilar	Commelinaceae
12b. Perianth lobes similar	Liliaceae
13a. Inflorescence a spadix.....	Musaceae
13b. Inflorescence otherwise.....	14
14a. Pollen grains collected in pollinia; seeds minute	Orchidaceae
14b. Pollen grains not collected in pollinia; seeds not minute	15
15a. Flowers zygomorphic	16
15b. Flowers actinomorphic.....	18
16a. Stamen with distinct filament, anther two celled	17
16b. Stamen sessile, anther one celled.....	Marantaceae
17a. Leaves arrangement distichous	Costaceae
17b. Leaves arrangement is not distichous	Zingiberaceae
18a. Stamens free	Hypoxidaceae
18b. Stamens united	Haemodoraceae

RANUNCULACEAE

- 1a. Terminal leaflet modified into tendrils..... Naravelia
1b. Terminal leaflet entire, not modified Clematis

CLEMATIS L., Sp. Pl. 543. 1753.

- 1a. Sepals 4, 7 mm long, flowers numerous..... C. gouriana
1b. Sepals 5, above 10 mm long, flowers few..... C. smilacifolia

Clematis gouriana Roxb. ex DC., Syst. Nat. 1: 138. 1817; Hook. f., Fl. Brit. India 1: 4. 1872; Gamble, Fl. Pres. Madras 3(2). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 35. 1988; M. A. Rau in B. D. Sharma et al., Fl. India 1: 64. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 113. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 87. 2009.

Climbing herbs; young branches pubescent. Leaves opposite, 3-foliolate; leaflets 3-7, 4-6 x 1.5-3 cm, ovate, acute at apex, rounded at base, nerves tomentose below. Inflorescence drooping panicles, terminal and axillary, tomentose. Flowers white, 1 cm across. Tepals 7 x 4 mm, oblong, obtuse, pubescent. Stamens many, filaments 8 mm long, glabrous. Carpels 10-15, pubescent ovules 1 in each. Fruits achenes, 3 x 1 mm, ovoid, hairy; style persistent, ca. 30 mm long.

Ambalappara, KVB 31587

Fl. & Fr.: November-March

Distribution: Common along the margins of Grasslands at Ambalappara.

Clematis smilacifolia Wall., Asiat. Res. 13: 402. 1820; Hook. f., Fl. Brit. India 1: 3. 1872; M. A. Rau in B. D. Sharma et al., Fl. India 1: 75. 1993. *Clematis loureiriana* Merr., Trans. Amer. Phil. Soc. 24: 154. 1935 p.p., non DC. 1818.

Climbers; branchlets glabrous. Leaves 1-3-foliolate; leaflets to 18 x 14 cm, broadly ovate, acute at apex, cordate at base, glabrous, purplish beneath; nerves 7-9; petioles 2-15 cm long, twining. Cymes 3-few flowered, trichotomous; peduncles 4-5 cm long, dark brownish hairy; bracts to 2 x 0.5 cm; pedicels to 15 cm long, ribbed. Flowers 35 mm across, creamy-white. Tepals ovate, greenish-brown. Achenes to 11 x 5 mm, hairy; stigma persistent, 7 cm long.

Ambalappara, KVB 22549

Fl. & Fr.: August-February

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to India.

NARAVELIA Adanson, Fam. Pl. 2: 460, 581. 1763 (*nom. cons.*).

Naravelia zeylanica (L.) DC., Syst. Nat. 1: 167. 1817; Hook. f., Fl. Brit. India 1: 7. 1872; Gamble, Fl. Pres. Madras 3(3). 1915; Manilal & Sivar., Fl. Calicut 25. 1982; Ansari, Fl. Kasaragod Div. 52. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 35. 1988; M. A. Rau in B. D. Sharma et al., Fl. India 1: 106. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 115. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 87. 2009. *Atragene zeylanica* L., Sp. Pl. 542. 1753.

Climbing shrubs; young stem, leaves and buds densely villous; roots tuberous. Leaves opposite, 2-3-foliolate; leaflets 4-12 x 3-8 cm, elliptic-ovate, apex acute or acuminate, base rounded, margins distantly dentate, pubescent beneath, glabrous above, basally 5-ribbed; terminal leaflet transformed into a

3-fid, hooked tendril, up to 9 cm long; petioles 5-10 cm long. Inflorescence terminal and axillary divaricately branched, up to 15 cm long panicles. Flowers greenish yellow, c. 1.5 cm across, bisexual. Sepals 4-5, greenish yellow, 0.8-1 cm long, elliptic, pubescent without. Petals 6-12, greenish yellow, 0.7-0.9 x 1-1.5 mm, linear to spatulate. Stamens many; filaments ligulate; staminodes 10-14, petaloid. Carpels many; ovule one per carpel; style 1.5-2 mm long; stigma clavate. Fruit achenes many; 0.8-1 cm long, linear, stalked, with spirally twisted, 3-4 cm long, feathery persistent style.

Crossway, KVB 31525

Fl. & Fr.: October-April

Distribution: Common throughout the Sanctuary.

DILLENACEAE

DILLENIA L., Sp. Pl. 535. 1753.

1a. Inflorescence on leafy branches, flowers white *D. bracteata*

1b. Inflorescence on old branches with out leaves, flowers yellow *D. pentagyna*

Dillenia bracteata Wight, Ic. t. 358. 1840-43; Hook. f., Fl. Brit. India 1: 37. 1872; Gamble, Fl. Pres. Madras 7 (5). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 36. 1988; N. C. Majumdar in B. D. Sharma et al., Fl. India 1: 154. 1993; N.P. Balakr. & G.V.S. Murthy in P. Daniel, Fl. Kerala 1: 120. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 88. 2009.

Trees, to 20 m high, bark greyish-brown; young shoots tomentose; leaf scars clasp the branches half the circumference. Leaves simple, alternate, spiral, 15-45 x 5-20 cm, obovate to elliptic-obovate, apex acute, acuminate or obtuse, base cuneate, acute, or obtuse, margin serrate or rarely entire, coriaceous, glabrescent at maturity; lateral nerves 12-20 pairs, parallel, prominent; intercostae subscalariform, faint stipules lateral, deciduous; petiole 10-50 mm long, stout, pubescent, grooved above. Flowers in racemes or in 2-7 flowered clusters, bisexual, white, 2.5-3 cm across; pedicels 4-10 mm long; bracts lanceolate or spatulate, hirsute, early cauducous. Sepals 5, ovate, 8-12 x 5-9 mm, coriaceous, reddish, silky pubescent. Petals 5, obovate, 15-20 x 5-10 mm, white. Stamens numerous, cohering slightly at base, in 2 series, purple blue; anthers linear, opening by small slits. Carpels 5, cohering at the axis, ovules many; styles 5, free, 9 mm. Pseudocarp orange, subglobose, enclosed within sepals, 2.5-3 cm across. Fruits 8 x 5 mm; seeds 1 or 2, 5 x 4.5 mm, ovoid, dark reddish-brown to black, arillate, glabrous.

Ambalappara, KVB 31748

Fl. & Fr.: December-February

Distribution: Common in Evergreen forests of Kattikari and Ambalappara.

Endemic to Western Ghats

Dillenia pentagyna Roxb., Pl. Corom. t. 20. 1795; Hook. f., Fl. Brit. India 1: 38. 1872; Gamble, Fl. Pres. Madras 8 (6). 1915; Manilal & Sivar., Fl. Calicut 25. 1982; Ansari, Fl. Kasaragod Div. 52. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 36. 1988; N. C. Majumdar in B. D. Sharma et al., Fl. India 1: 156. 1993; N.P. Balakr. & G.V.S. Murthy in P. Daniel, Fl. Kerala 1: 122. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 89. 2009.

Deciduous trees, to 25 m high, bark 15-20 mm, thick, surface grey, molted with white, smooth; blaze pink-red; branchlets stout, with prominent 'V' shaped leaf scars. Leaves simple, alternate, spiral, clustered at the tip of

branchlets, 15-60 x 10-25 cm, obovate to oblong-lanceolate, scarious, apex obtuse, base acute or attenuate, margin serrate, rarely entire, glabrous above, puberulent beneath; lateral nerves many, parallel, prominent, intercostae scalariform, faint; estipulate; petiole 15-60 mm long, sheathing, stout, glabrous, winged. Flowers bisexual, fascicled on old branches, 2.5-3 cm across, yellow, fragrant; pedicels 2.5-6 cm long; bracts hairy. Sepals 5, 8-12 mm long, obovate or elliptic, glabrous, accrescent. Petals 5, 10-20 x 7-12 mm, obovate, obtuse, bright yellow. Stamens numerous, yellow in 2 series, outer series with 60-90 stamens, each 2.5-4 mm long, inner series with up to 10 stamens, each 6-9 mm long. Carpels 5-10, cohering at the axis, arranged on the narrow conical receptacle, unilocular, ovules many; styles free, 4 mm long. Fruit an aggregate of berries, drooping, subglobose, 15 x 13 mm, indehiscent, fleshy, yellow, orange or red, subtended by persistent sepals; seeds numerous, 5 x 3.5 mm, ovoid, black, glabrous, exarillate.

Valayamchal, *KJD 26356*

Fl. & Fr.: February-June

Distribution: Common in Semi-evergreen forests of Valayamchal.

ANNONACEAE

- 1a. Climbers..... 2
- 1b. Shrubs or trees..... 4
- 2a. Flowers on hooked peduncles..... *Artabotrys*
- 2b. Flowers not on hooked peduncles..... 3
- 3a. Petals less than 2 cm long..... *Uvaria*
- 3b. Petals more than 4 cm long..... *Desmos*
- 3a. Inner petals clawed, nectaries present..... *Orophea*
- 3b. Inner petals not clawed, nectaries absent..... 4
- 4a. Flowers sessile..... *Meiogyne*
- 4b. Flowers pedicelled..... 5
- 5a. Petals dissimilar, outer much smaller than the inner..... *Milusa*
- 5b. Petals subsimilar..... 6
- 6a. Shrubs or small trees, outer petals clawed at base..... *Goniothalamus*
- 6b. Medium trees, all petals alike, not clawed at base..... *Polyalthia*

ARTABOTRYS R. Brown, Bot. Reg. 5: 423. 1820.

Artabotrys zeylanicus Hook. f. & Thoms., Fl. Ind. 128. 1855 & Hook. f., Fl. Brit. India 1: 54. 1872; Gamble, Fl. Pres. Madras 14(10). 1915; Manilal & Sivar., Fl. Calicut 26. 1982; Ansari, Fl. Kasaragod Div. 53. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 37. 1988; Debika Mitra in B. D. Sharma et al., Fl. India 1: 253. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 139. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 92. 2009.

Woody climbers. Leaves simple, alternate, 13-18 x 5-7 cm, oblong, acute at both ends; nerves 10-12 pairs; petiole striate. Flowers a few; pedicels 1-2 cm long, stout with 4 bracts at base. Sepals 3, to 8 x 6 mm, broadly ovate, pubescent. Petals 6, 2.5-3 x 0.7 cm, oblong-lanceolate, concave at base inside, pubescent, yellow. Stamens many, anthers oblong, concealed by the flat and broad connectives. Carpels several, tomentose, ovules paired in each cell. Fruitlets sessile, 15-22 mm dia, globose, densely packed.

Paripode, *KVB 31279*

Fl. & Fr.: September-June

Distribution: Common in Semi-evergreen forests of Pookundu, Narikkadavu, Kariyenkappu and Paripode.

DESMOS Loureiro, Fl. Cochinch. 1: 352. 1790, 'Desmis'

Desmos lawii (Hook. f. & Thoms.) Safford, Bull. Torrey Bot. Club 39: 506. 1912; Debika Mitra in B. D. Sharma *et al.*, Fl. India 1: 261. 1993; Ramach. & V.J. Nair, Fl. Cannanore Dist. 38. 1988 M. Mohanan in P. Daniel, Fl. Kerala 1: 143. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 93. 2009. *Unona lawii* Hook. f. & Thoms., Fl. Ind. 132. 1855 & Hook. f., Fl. Brit. India 1: 59. 1872; Gamble, Fl. Pres. Madras 15(10). 1915.

Woody climbers; young shoots sericeous tomentose. Leaves simple, alternate, 9-13 x 3-4 cm, ovate-oblong, apex acute, base rounded, glaucous below; nerves 8 pairs. Flowers solitary, axillary; pedicels 2-4 cm long, slender, bracteate. Sepals to 9 x 6 mm, obovate, pubescent, yellowish green. Petals biseriate, 5-7 x 0.5 cm, linear-oblong, pubescent; stamens 1 mm long. Carpels many, densely hairy, stigma globose, red. Fruitlets to 7 x 6 mm, globose-oblong, stipitate, beaked; seeds globose; stipe 1 cm long, slender.

Chavachi, NS & KVB 31467

Fl. & Fr.: April-July

Distribution: Fairly common in the Evergreen forests of Meenmutty and Chavachi.

GONIOTHALAMUS J.D. Hooker & Thompson, Fl. Ind. 105. 1855.

Goniothalamus cardiopetalus (Dalz.) Hook. f. & Thoms., Fl. Ind. 107. 1855 & Hook. f., Fl. Brit. India 1:75.1872; Gamble, Fl. Pres. Madras 18 (13). 1915; Ansari, Fl. Kasaragod Div. 54. 1985; Debika Mitra in B. D. Sharma *et al.*, Fl. India 1: 232. 1993; Ramach. & V.J. Nair, Fl. Cannanore Dist. 38. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 93. 2009. *Polyalthia cardiopetala* Dalz. in Hook. 's, J. Bot. Kew Gard. Misc. 2:39.1850.

Shrubs or small trees, 3-5 m tall; young branches puberulous. Leaves alternate, 10-23 x 2.5-7.5 cm, oblong-lanceolate or oblanceolate, cuneate at base, abruptly acuminate at apex, slightly undulate along margins, coriaceous, glabrous, brownish beneath; lateral nerves 8-15 pairs, prominently raised beneath, looping near margins; petioles 5-10 mm long, glabrous. Flowers solitary or a few in superposed clusters, axillary; pedicels 5-10 mm long, pubescent when young; bracts minute at the base of pedicels. Sepals 3, almost orbicular, connate upto middle, free at tips, ca 6 mm across, brownish pubescent. Petals 6 outer 3 cucullate, oblong-ovate, clawed at base, acute at apex, 10-15 x 4-6 mm, brown tomentose; inner ones triangular, united into a mitriform column, 6-9 x 5 mm. Stamens many, ca 2 mm long; connectives capitate at apex. Carpels many, linear-oblong, ca 3 mm long, brown-pubescent, 1-ovuled; styles 2-3 mm long, curved; stigma bilobed. Fruitlets ellipsoid, ca 1.5 x 0.7 cm; seed one.

Paripode, KVB 31675; Pothurumi, KVB 31727

Fl. & Fr.: January-August

Distribution: Common in the Evergreen Forests of Chavachi, Kattikari, Moonamthode and Meenmutty, Semi-evergreen forests of Paripode etc. Endemic to southern Western Ghats.

MEIOGYNE Miquel, Ann. Mus. Bot. Lugduno-Batav. 2: 12. 1865.

1a. Petals over 1 cm broad; fruit tomentose *M. pannosa*
1b. Petals less than 7 mm broad; fruit glabrous *M. ramarowii*

Meiogyne pannosa (Dalz.) Sinclair, Sarawak Mus. J. 5: 604. 1951; Debika Mitra in B. D. Sharma *et al.*, Fl. India 1: 266. 1993; Ramach. & V.J. Nair, Fl.

Cannanore Dist. 39. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 94. 2009. *Unona pannosa* Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 3: 207. 1851; Hook. f., Fl. Brit. India 1: 58. 1872; Gamble, Fl. Pres. Madras 14(10). 1915. *Desmos pannosus* (Dalz.) Safford, Bull. Torrey Bot. Club 39: 506. 1912.

Small trees, 4-9 m tall, bark smooth, greyish, mottled with green, young shoots puberulous, branchlets slender. Leaves simple, alternate, distichous, , 2.5-7 x 1.5-3 cm, elliptic ovate, ovate or ovate lanceolate, apex acuminate or caudate acuminate, base obtuse or rounded, margin entire, coriaceous, glabrous and glossy above, slender, prominent, pinnate, regular; intercostae reticulate; petiole 5-9 mm long, slender, pubescent; estipulate. Flowers solitary, subsessile, axillary or terminal, dull yellowish-green or creamy white. Sepals 3, 4-6 x 4-5 mm, ovate, tomentose outside, glabrous inside, connate at base. Petals 6 (3+3), 2.5-5 x 0.5-1.5 cm, outer spreading, clawed, inner erect and smaller, oblong-lanceolate or ovate-lanceolate, densely silky tomentose. Stamens numerous, cuneate, connective broad, concealing the anthers, capitate. Carpels many, sessile or subsessile, oblong, 2-2.5 mm long, strigose; ovules 2-8 in one row, stigma capitate. Fruit aggregate, fruitlets 12 x 8 mm, yellowish, obovoid, fulvous tomentose, apiculate; seeds 1-3, globose, shiny.

Chavachi, KVB 31523; Paripode, KVB 31677; Ambalappara, KVB 31716
Fl. & Fr.: Through out the year
Distribution: Common in the Evergreen forests of the Sanctuary. Endemic to Western Ghats

Meiogyne ramarowii (Dunn) Gandhi in Saldanha & Nicolson, Fl. Hassan Dist. 38. 1976; Ansari, Fl. Kasaragod Div. 54. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 39. 1988; Debika Mitra in B. D. Sharma et al., Fl. India 1: 266. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 95. 2009. *Unona ramarowii* Dunn, Bull. Misc. Inform. Kew 1914: 183. 1914; Gamble, Fl. Pres. Madras 15(10). 1915. *Desmos ramarowii* (Dunn) Das, Bull. Bot. Surv. India 5: 42. 1963.

Shrubs, bark grey; branchlets hirsute. Leaves oblong, apex acuminate, base rounded, hirsute below, nervules parallel; petiole 8 mm long. Flowers dull white, sessile. Sepals 12 x 6 mm, ovate, acute, hispid. Petals lanceolate, saccate at base, densely hispid. Carpels densely villous. Fruitlets to 2.5 x 1 cm, red, oblong, shortly stalked, tomentose, depressed between seeds; seeds 1-3, globose.

Chavachi, KVB 31522; KJD 26174

Fl. & Fr.: January-September

Distribution: Rare in the Evergreen forests of Chavachi and Kattikari. Endemic to southern Western Ghats

Miliusa Leschenault ex A.P. de Candolle

Miliusa wayanadica Sujanapal, Ratheesh & Sasidh., J. Bot. Res. Inst. Texas 4: 64. 2010; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 98. 2009.

Shrubs; bark black, branches terete, branching horizontal, young parts densely pubescent. Leaves simple, alternate, 6-9 x 2-3 cm, lanceolate or elliptic-lanceolate, apex caudate acuminate, base rounded, slightly oblique, margins entire; lateral nerves 5-8 pairs, intramarginal nerves sub-marginal, tomentose on both sides; petiole to 3 mm or subsessile, coriaceous. Flowers solitary, axillary or slightly above the axil, pedicel 4-7 mm long, glabrous,

bracteoles two at the base, unequal, triangular, very small. Flowers yellow or yellowish-green; Sepals 3, ca. 4 × 3 mm, broadly ovate. Outer petals 3, triangular, ca. 3 mm long, slightly curved on mature flower, prominently hairy on margins; inner petals 3, broadly ovate, 7-9 × 2-4 mm, upper half out-curved at 90°, hairy on the mouth; torus triangular, long hairy. Stamens 6+3, anthers in pairs, staminodes 3, arranged alternate with two stamens, one pair slightly above the staminode, connective slightly prolonged above the anther, connective truncate, anthers extrorse. Carpels 7-12, flask shaped, 2 mm long, glabrous, stigma club-shaped, with viscous exudation on the torus in mature flower, ovules 1 or 2. Fruitlets 6-8, subglobose, glabrous, brownish or blackish when dry, apiculate; stipe terete, 10-13 mm long, stalk ca. 5 mm, monocarp 8-10 mm across; seeds 1 or 2.

Ambalappara, *KVB 31592; 31712, 31790*; Asthipara, *KJD 26085*

Fl. & Fr.: December-August

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthipara. Endemic to southern Western Ghats.

OROPHEA Blume, *Bijdr.* 18. 1825.

Orophea sivarajanii Sasidh., *Nordic J. Bot.* 19: 301. 1999; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 99. 2009.

Shrubs, 2-3 m tall, young shoots glabrous. Leaves alternate, 7-15 x 3-6 cm, oblong or elliptic-oblong, acuminate at apex, obtuse or rounded at base, glabrous; lateral nerves 7-11 pairs, prominent below and faint above, intercostae widely reticulate, prominulous below and inconspicuous above; petiole 2-3 mm long, glabrous. Flowers in 2 or 3 flowered 1.5-2 cm long glabrous racemes or solitary, axillary or lateral; pedicels 8-12 mm long, glabrous; bract 0.5 mm long, ovate-acute, towards the upper half of the pedicel. Sepals 2 x 2.5 mm, jointed at base, ovate-deltoid, acute, ciliolate along the margins, otherwise glabrous. Outer petals 4 mm across, ovate-orbicular, tomentose along the margins; inner petals 7 mm long (with claw), greenish towards the upper half and white in the lower half, tomentose along the margins; nectaries 2, distinct, horizontal with thick undulating margins and shortly hooked downwards apex. Stamens 12 in 2 rows of 6 each. Carpels 6, glabrous; ovules 2, style hairy. Fruitlets globose, 8 mm across.

Pothurumi, *KVB 31616*

Fl. & Fr.: November-February.

Distribution: Fairly common in Evergreen forests of Chavachi and Pothurumi.

Endemic to southern Western Ghats of Kerala.

POLYALTHIA Blume, *Fl. Javae. Anonac.* 68. 1830.

1a. Flowers solitary or in fascicles, often from the trunk *P. coffeoides*

1b. Flowers in cymes, axillary to leaves or from branchlets *P. fragrans*

Polyalthia coffeoides (Thw. ex Hook. f. & Thoms.) Hook. f. & Thoms. in Hook. f., *Fl. Brit. India* 1: 62. 1872; Gamble, *Fl. Pres. Madras* 16(11). 1915; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 41. 1988; Debika Mitra in B. D. Sharma et al., *Fl. India* 1: 270. 1993; M. Mohanan in P. Daniel, *Fl. Kerala* 1: 164. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 101. 2009. *Guatteria coffeoides* Thw. ex Hook. f. & Thoms., *Fl. Ind.* 141. 1855.

Trees to m tall; bole straight with knots and tubercles; bark smooth, dark green, often mottled with greyish-white, young shoots slender, minutely puberulous; branches horizontal. Leaves alternate, distichous, young leaves red at first, 10-27 x 3.5-8.5 cm oblong, oblong-lanceolate or elliptic-lanceolate, apex acute or acuminate, base obtuse, cuneate-round or acute; margin entire, slightly undulate; coriaceous, glabrous and shiny above; lateral nerves 8-14 pairs, prominent beneath, pinnate, ascending; intercostae scalariform, obscure; petiole 10-13 mm, stout, glabrous, grooved above. Flowers bisexual greenish-yellow, solitary, extra axillary or some times fascicled on woody tubercles on trunk; pedicels 1-4 cm long, slender, pubescent. Sepals 3, 2 x 5 mm, suborbicular, tomentose. Petals 6 (3+3), 3-5 x 0.5-1 cm, greenish-yellow, flat and strap shaped, subequal; torus convex. Stamens numerous, 1 mm long, cuneate, connectives subglobose at top, concealing the anthers, anther cells remote. Carpels numerous, 3-4 mm long, densely pubescent, oblong, stalked, stigma capitate; ovule one, basal and ascending. Fruit aggregate of berries, 2.5 x 1.5 cm, ovoid, apiculate, dark purple; seed one, broadly ovoid, grooved, smooth and shiny.

Meenmuttery road, *KJD 26289*

Fl. & Fr.: May-August

Distribution: Fairly common in Evergreen forests of Meenmuttery

Polyalthia fragrans (Dalz.) Bedd., Fl. Sylv. t. 74. 1871; Hook. f., Fl. Brit. India 1: 63. 1872; Gamble, Fl. Pres. Madras 16(11). 1915; Debika Mitra in B. D. Sharma et al., Fl. India 1: 271. 1993 M. Mohanan in P. Daniel, Fl. Kerala 1: 164. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 102. 2009. *Guatteria fragrans* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 200. 1851.

Tall trees, to 30 m; bole straight, buttressed; bark, 10-12 mm thick, surface blackish-grey, mottled with white, smooth, lenticellate; branches horizontal, spreading; young branches tomentose. Leaves simple, alternate, distichous, 9-27 x 3-12 cm, elliptic to oblong-lanceolate, apex acute to shortly acuminate, base acute, obtuse or rounded, margin entire, glabrous and shiny above, slightly pubescent on the costae and veins beneath; lateral veins 16-21 pairs, close, prominent beneath, intercostae subscalariform; petiole 10-15 mm long, stout, grooved above, glabrous. Flowers bisexual, greenish-yellow, fragrant, in few flowered cymes from the axils of fallen leaves or on tubercles. Sepals 3, orbicular, 4 x 3 mm, pubescent. Petals 6 (3+3), subequal, linear-lanceolate, tomentose. Stamens numerous, cuneate, connectives concealing the anther cells, anther cells remote; carpels many, oblong-ovoid, slightly curved, stipitate, strigose, stigma broad, slightly bifid, blunt, ovules basal and ascending. Fruit aggregate of berries; berry 3-5, 1.5-2 cm, obliquely ellipsoid to broadly ovoid, blunt, hoary puberulous, ash coloured; seed one, orbicular, ovoid.

Kattikari State Boundary, *KJD 26036*

Fl. & Fr.: January-May

Distribution: Rare in Evergreen forests of Kattikari. Endemic to southern Western Ghats.

UVARIA L. Sp. Pl. 1: 536. 1753.

Uvaria macropoda Hook. f. & Thoms., Fl. Ind. 101. 1855 & in Hook. f., Fl. Brit. India 1: 50. 1872; Gamble, Fl. Pres. Madras 13 (9). 1915. *Desmos zeylanicus* sensu Subramanian, Fl. Thenmala 1995, non (Hook. f. & Thomson) Staff. 1912.

Woody climbers; young shoots tomentose. Leaves simple, alternate, 15 x 5 cm, narrowly elliptic or oblong, apex acute or acuminate, base obtuse or rounded, glabrous. Flowers solitary. Pedicels and calyx tuberculate, ferrugineous-tomentose. Petals dull-purple with yellow at base, elliptic or ovate, connate at base, tomentose on both sides. Fruitlets long-stipitate.

Chavachi, NS & KVB 31310

Fl. & Fr.: March-July

Distribution: Fairly common in Semi-evergreen forests of Pookundu and Narikkadavu, Evergreen forests of Chavachi.

MENISPERMACEAE

- 1a. Leaves white hoary pubescent on the under surface; stem deep yellow inside *Coscinium*
- 1b. Leaves surface tomentose or glabrous; stem not deep yellow inside 2
- 2a. Petals absent *Anamirta*
- 2b. Petals present 3
- 3a. Stamens free, leaves not peltate *Diploclisia*
- 3b. Stamens united in to column with a peltate disc, peltate leaves 4
- 4a. Flowers in peduncled, solitary or umbellate heads, petals free... *Stephania*
- 4b. Flowers in panicles, petals connate *Cyclea*

ANAMIRTA Colebr., Trans. Linn. Soc. London 13: 52, 66. 1821.

Anamirta cocculus (L.) Wight & Arn., Prodr. 446. 1834; Hook. f., Fl. Brit. India 1: 93. 1872; Gamble, Fl. Pres. Madras 28(19). 1915; Manilal & Sivar., Fl. Calicut 29. 1982; Ansari, Fl. Kasaragod Div. 57. 1985; A. Pramanik in B. D. Sharma et al., Fl. India 1: 311. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 178. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 103. 2009. *Menispermum cocculus* L., Sp. Pl. 340. 1753. *Anamirta paniculata* Colebr., Trans. Linn. Soc. London 13: 66. 1822.

Woody climbers. Leaves simple, alternate, 20-25 x 15-19 cm, broadly ovate, apex acute, base truncate, margin entire; 5-ribbed, coriaceous; petiole 8-13 cm long. Flowers unisexual, many, in large drooping panicles on old branches. Sepals 6 in 2 rows, 3 x 2 mm, ovate, yellow. Petals absent. Stamens 9, combined into a globose staminal column, anthers sessile; staminodes 9 in female flowers, obovate, scaly. Carpels 3, free; style absent; stigma recurved. Fruit of 1-3 drupes, 1 cm across, obliquely ovoid, gibbous, black, smooth; seeds 1, black, glabrous.

Kariyenkappu, KJD 31845

Fl. & Fr.: August-December

Distribution: Fairly common in plantations of Kariyenkappu.

COSCINIUM Colebr., Trans. Linn. Soc. 13: 51. 1822.

Coscinium fenestratum (Gaertn.) Colebr., Trans. Linn. Soc. London 13: 65. 1822; Hook. f., Fl. Brit. India 1: 99. 1872; Gamble, Fl. Pres. Madras 27(19). 1915; A. Pramanik in B. D. Sharma et al., Fl. India 1: 313. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 183. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 104. 2009. *Menispermum fenestratum* Gaertn., Fruct. 1: 219, t. 45, f.5. 1788.

Woody climbers; wood yellow, branchlets hoary pubescent. Leaves simple, alternate, deltoid, 15-18 x 13-15 cm, ovate, apex acuminate, base truncate,

margin entire; 5-7 ribbed; petiole 10-12 cm long. Inflorescence supra-axillary or cauliflorous. Female flowers mostly from old wood. Sepals 6, sericeous. Petals 3; ovary densely pilose, staminodes 6. Fruit of 1 or 2 drupes, to 2 cm dia, globose, brown villous, endocarp bony, peduncle to 12 cm; seed 1, black, glabrous.

Paripode, KVB 31680

Fl. & Fr.: August-December

Distribution: Rare in plantations of Kariyenkappu and Evergreen forests of Chavachi and Meenmutty.

CYCLEA Arn. ex Wight, Ill. Ind. Bot. 1: 22. 1840.

1a. Leaves glabrous *C. fissicalyx*

1b. Leaves hairy *C. peltata*

Cyclea fissicalyx Dunn in Gamble, Fl. Pres. Madras 31(22). 1915 & Bull. Misc. Inform. Kew 1916: 60. 1916; Gangop. in B. D. Sharma et al., Fl. India 1: 324. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 185. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 105. 2009. *Cyclea peltata* Miers, Contr. Bot. 3: 236. 1871, non (Lam.) Hook. f. & Thoms. 1855.

Climbers; Leaves simple, alternate, peltate, 8-10 x 4-5 cm, ovate, apex sharply acuminate, base truncate, margin entire; 5-ribbed, reticulate, glabrous; petiole 1.5-2.5 cm long. Panicle to 15 x 5 cm, flowers 2 mm across, glabrous, shortly pedicelled; peduncles slender; bracts foliar. Calyx campanulate, glabrous. Petals connate; anthers in male flowers connate into a ring at the top of staminal column. Ovary in female flowers hairy; style trifid.

Kattikari Sate Boundary, KJD 26019

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests of Kattikari. Endemic to southern Western Ghats of Kerala; Conservation status: Endangered.

Cyclea peltata (Lam.) Hook. f. & Thoms., Fl. Ind. 201. 1855 & in Hook. f., Fl. Brit. India 1: 104. 1872p.p; Gamble, Fl. Pres. Madras 31(22). 1915; Manilal & Sivar., Fl. Calicut 29. 1982; Ansari, Fl. Kasaragod Div. 58. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 42. 1988; Gangop. in B. D. Sharma et al., Fl. India 1: 325. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 186. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 105. 2009. *Menispermum peltatum* Lam., Encycl. 4: 96. 1797. *Cyclea burmannii* (DC.) Hook. f. & Thoms., Fl. Ind. 201. 1855 & Hook. f., Fl. Brit. India 1: 104. 1872. *Clypea burmannii* Wight & Arn., Prodr. 1: 14. 1834. *Cyclea arnottii* Miers, Ann. Mag. Nat. Hist. ser. 3, 18:19.1866; Gamble, Fl. Pres. Madras 31(22).1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 42. 1988; M. Mohanan in P. Daniel, Fl. Kerala 1: 184. 2005. *Cocculus burmannii* DC., Syst. Nat. 1: 517. 1817.

Climbing shrubs; Leaves simple, alternate, peltate, 8-10 x 6-7 cm, ovate, apex acute or acuminate, base cordate, margins entire; 4-8 ribbed, pubescent below. Panicles to 20 x 7 cm, rachis pubescent; flowers densely packed towards the branch tips, sessile, densely hairy. Male flowers 1.5 mm across; sepals hairy outside; petals glabrous. Female flowers smaller; sepal-1, hairy; petal-1, hairy; carpel one, densely hairy. Drupe 4 mm dia, subglobose, white, pilose.

Kariyenkappu, KJD 18790

Fl. & Fr.: April-May

Distribution: Fairly common in fringe areas of moist deciduous forests.

DIPLOCLISIA Miers, Ann. Mag. Nat. Hist. (ser. 2) 7: 37, 42. 1851.

Diploclisia glaucescens (Blume) Diels in Engl., Pflanzenreich Menispermac. 225. 1910; Gamble, Fl. Pres. Madras 28 (20). 1915; Manilal & Sivar., Fl. Calicut 28. 1982; Ansari, Fl. Kasaragod Div. 58. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 43. 1988; A. Pramanik in B. D. Sharma et al., Fl. India 1: 327. 1993; M. Mohanan in P. Daniel, Fl. Kerala 1: 187. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 106. 2009. *Cocculus glaucescens* Blume, Bijdr. 25. 1825. *Cocculus macrocarpus* Wight & Arn., Prodr. 13. 1834; Hook. f., Fl. Brit. India 1: 101. 1872.

Woody climbers. Leaves simple, alternate, 6-8 cm across, broadly ovate to orbicular, apex obtuse, base truncate or some times slightly cordate, glaucous below, margin entire, membranous; petiole 1.5-3 cm long. Flowers unisexual, in large drooping panicles, bright yellow. Sepals 6 in two whorls, 3 mm long, obovate. Petals 6, smaller than sepals concave with incurved margins, 2 mm long, obovate, emarginated. Stamens 6 in male flowers, staminodes absent. Carpels 3, free in female flowers; style cylindrical. Drupe compressed, curved, tubercled.

Pothanplavu, NS & KVB 31322

Fl. & Fr.: March-August

Distribution: Rare in Semi-evergreen forests of Pothanplavu and Evergreen forests of Kurumbanpara.

STEPHANIA L., Fl. Cochinch. 598, 608. 1790.

Stephania japonica (Thunb.) Miers, Ann. Mag. Nat. Hist. ser.3, 18: 14. 1866, **var. japonica**; Gamble, Fl. Pres. Madras 29(21). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 43. 1988; Gangop. in B. D. Sharma et al., Fl. India 1: 335. 1993; Swarup. et al., Shola For. Kerala 60. 1998; M. Mohanan in P. Daniel, Fl. Kerala 1: 190. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 106. 2009. *Menispermum japonicum* Thunb., Fl. Japan 193. 1784. *Cissampelos hernandifolia* Willd., Sp. Pl. 4: 861. 1806. *Stephania hernandifolia* (Willd.) Walp., Rep. 1: 96. 1842; Hook. f., Fl. Brit. India 1: 103. 1872. *Cyclea hernandifolia* (Willd.) Wight & Arn., Prodr. 14. 1834.

Climbers. Leaves simple, alternate, peltate, 7-10 x 4-8 cm, ovate or suborbicular, acute or obtuse at apex, base cordate, puberulous beneath, margins entire; petioles 2.5-4.5 cm long. Male flowers in axillary 6-8 cm long umbels, sessile or subsessile, greenish or white; sepals 8 in 2 whorls of 4 each, free, oblanceolate, ca. 1.5 mm long, glabrous or puberulous outside; petals 3-5, suborbicular, ca 0.8mm long, greenish; stamens 6-8, connate into a peltate synandrium; anthers dehiscing transversely. Female inflorescence similar to male ones; sepals 3-5, oblong or elliptic; petals 3-5, suborbicular; staminodes absent; carpel 1, ovoid; stigmas 3-lobed. Drupes globose or obovoid, ca 6 x 8 mm, with basal stylar scar, red; endocarp transversely ridged.

Pothurumi, NS & KJD 25542

Fl. & Fr.: December-September

Distribution: Fairly common in Evergreen forests of Ambalappara-Pothurumi region.

BRASSICACEAE/ CRUCIFERAE

BRASSICA L., Sp. Pl. 666. 1753.

Brassica juncea (L.) Czern. & Coss. in Czern., Consp. Pl. Chark. 8. n. 5. 1859; Hook. f., Fl. Brit. India 1: 157. 1872; Gamble, Fl. Pres. Madras 38(28). 1915; Hajra et al. in B.D. Sharma & N.P. Balakr., Fl. India 2: 134. 1993; A.N. Henry & T. Ravish. in P. Daniel, Fl. Kerala 1: 210. 2005; Sunil & Sivadasan, Fl. Alappuzha Dist. 88. 2009. *Sinapis juncea* L., Sp. Pl. 668. 1753.

Annual erect herbs; densely long-branched especially above, glabrous, subglaucous. Leaves simple, alternate, 20 x 10 cm, lower and basal petiolate with lamina irregularly dentate, with 1-3 pairs of lateral lobes, not auriculate; upper 5-10 x 1.5-3 cm, petiolate to subpetiolate, lanceolate or oblanceolate and acute, to obovate and obtuse, coarsely dentate to subentire, not auriculate. Inflorescence 15-30 cm long in fruit; pedicels 5-12 mm long, ascending. Sepals 3.5-4 mm long, oblong. Petals bright yellow, 4.5-8(-10) mm long, clawed with obovate limb. Anthers 1.5-2 mm broad with conical beak 5-7 mm long, midvein prominently keeled. Fruit a linear capsule, seeds 12-20, c. 1 mm diameter, dark reddish-brown, globose, finely reticulate.

Ambalappara, *KVB 31638*

Fl. & Fr.: December-July

Distribution: In Evergreen forests of Ambalappara

Note: The plants established from the seeds carried by people while staying in the forests.

CAPPARACEAE

- 1a. Ovary sessile, annuals, herbs Cleome
- 1b. Ovary stalked, perennial, shrubs or trees 2
- 2a. Leaves simple, shrubs, Capparis
- 2b. Leaves 3-foliolate, trees Crataeva

CAPPARIS L., Sp. Pl. 503. 1753.

Capparis moonii Wight, Illustr. 1: 35. 1840; Hook. f., Fl. Brit. India 1:175. 1872; Gamble, Fl. Pres. Madras 45(33). 1915; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2:277. 1993; R. Sundara. & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 232. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 114. 2009.

Scandent shrubs, branchlets glabrous. Leaves simple, opposite to sub opposite, 9-12 x 3-5 cm, elliptic-oblong, acute at both ends, glabrous, shining above, margins entire; petiole to 1.5 cm long, slender. Corymb terminal or in axils of upper leaves, few flowered. Flowers to 8 cm across. Sepals to 1.8 cm across, orbicular, puberulus. Petals to 5 x 3 cm, obovate, white, cottony hairy. Stamens numerous; filaments to 7.5 cm long, glabrous. Berry 6-8 cm across, globose, glabrous.

Uruppukunnu, *KJD 18758*

Fl. & Fr.: February-October

Distribution: Rare, in Evergreen forests.

CLEOME L., Sp. Pl. 671. 1753.

- 1a. Leaves simple or 1-foliolate, stamens 6 *C. monophylla*
- 1b. Leaves 3-5 foliate, stamens 12-18..... *C. viscosa*

Cleome monophylla L., Sp. Pl. 672. 1753; Hook. f., Fl. Brit. India 1: 168. 1872; Gamble, Fl. Pres. Madras 41(29). 1915; Manilal & Sivar., Fl. Calicut 34. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 46. 1988; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2: 312. 1993; R. Sundara. & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 242. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 116. 2009.

Erect annual herbs, up to 40 cm high, glandular-pubescent; stem branched, angled, striate. Leaves simple, alternate, 1.5-5 x 1-2.5 cm, ovate-oblong, or linear-lanceolate, base truncate, margins ciliate, apex acute; petiole up to 3.5 cm long. Racemes terminal, lax, up to 15 cm long. Flowers 1-1.5 cm across; pedicel up to 8 mm long, glandular pubescent. Sepals 3-4 mm long, linear, acuminate. Petals pink or light purple, 6-10 x 1.5-2 mm, obovate or spathulate, base clawed, apex rounded. Stamens 6; filaments 5-8 mm long, unequal. Ovary 5-8 mm long, linear. Capsule 7-10 cm long, linear, subcylindric, beaked, strongly ribbed, glandular, hairy; seeds c. 2 mm across, subobicular, ridged, dark brown.

Narikkadavu, *KJD 18796*

Fl. & Fr.: February-August

Distribution: Near stream sides and boundaries around Farm.

Cleome viscosa L., Sp. Pl. 672. 1753; Hook. f., Fl. Brit. India 1: 170. 1872; Gamble, Fl. Pres. Madras 41(29). 1915; Manilal & Sivar., Fl. Calicut 34. 1982; Ansari, Fl. Kasaragod Div. 62. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 47. 1988; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2: 317. 1993; R. Sundara. & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 245. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 116. 2009.

Erect profusely branched annual herbs, viscous with stalked glandular hairs. Leaves alternate, 3-5(-7)-foliolate; leaflets subsessile, 0.6-3.5 x 0.3-2 cm, elliptic-oblong or obovate to spathulate, apex obtuse, base cuneate, margins ciliate, membranous, glandular pubescent; petiole up to 5 cm long. Racemes terminal, lax, few-flowered, corymbiform. Flowers 1-1.5 cm across; pedicels to 1 cm long, elongate during fruiting. Sepals 4, 4-8 x 2-3 mm, lanceolate, apex acute, glandular hairy without. Petals 4, yellow, 6-12 x 3-5 mm, obovate to oblong-spathulate, apex rounded. Stamens 12-18; filaments 6-8 mm long, broadened at tip; anthers linear. Ovary sessile, 5-7 mm long, oblong-cylindric, glandular-hairy; stigma capitate. Capsules 5-6.5 x 0.3-0.5 cm, linear-oblong, terete, striate, densely glandular hairy; seeds many, 1-1.5 mm across, reniform, transversely ridged, reddish-brown.

Valayamchal, *KJD 18794*

Fl. & Fr.: March-July

Distribution: Near boundaries with Farm.

CRATAEVA L., Sp. Pl. 444. 1753.

Crataeva magna (Lour.) DC., Prodr. 1: 243. 1824; Ansari, Fl. Kasaragod Div. 63. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 47. 1988; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2: 324. 1993; R. Sundara. & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 248. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 117. 2009. *Capparis magna* Lour., Fl. Cochinch. 330. 1790. *Crataeva nurvala* Buch.-Ham., Trans. Linn. Soc. London 15: 121. 1827; Manilal & Sivar., Fl. Calicut 32. 1982; Anil Kumar et al., Fl. Pathanamthitta 56. 2005. *Crataeva religiosa* var. *nurvala* (Buch.-Ham.) Hook. f. & Thoms. in

Hook.f., Fl. Brit. India 1: 172. 1872. *Crataeva adansonii* DC. ssp. *odora* sensu Manilal & Sivar., Fl. Calicut 32. 1982, non (Buch.-Ham.) Jacobs, 1964.

Trees, to 10 m high, bark 2-3 mm thick, surface grey, smooth, longitudinally wrinkled. Leaves alternate, digitately trifoliate; rachis 4-12 cm long, slender, grooved above, glabrous; petiolule 4-7 mm long, slender; leaflets 10-20 x 3.5-6 cm, unequal, ovate, ovate-lanceolate or broadly elliptic, base acute, or subacute, apex acute or acuminate, margin entire, glabrous, coriaceous; lateral nerves 9-15 pairs, slender, parallel, prominent, intercostae reticulate, faint. Flowers bisexual, creamy white, in terminal corymbs; pedicel to 5 cm long. Sepals 4, 3 mm long, free, oblong, adnate to the lobed disc. Petals 4, ca. 2 cm long, creamy white, often tinged with purple, long-clawed, obovate. Disc incurved, nectariferous. Stamens many, free, longer than the petals, inserted at the base of gynophore; anthers basifixed, filaments spreading. Gynophore 4-5 cm long at anthesis, slender; ovary superior, ellipsoid, 1-[2]-celled, ovules many; stigma sessile, capitate. Fruit a berry, globose or ovoid, yellowish-grey, rind woody, scurfy, 4-5 x 2.5-3.5 cm; seeds brown, embedded in pulp.

Valayamchal, *KJD 18783*

Fl. & Fr.: March-June

Distribution: River banks in Semi-evergreen forests of Valayamchal to Odamthode.

VIOLACEAE

- 1a. Shrubs, flowers fascicled..... Rinorea
1b. Herbs, flowers solitary..... Viola

RINOREA Aubl., Hist. Pl. Gue. 1: 235, t. 93. 1775.

Rinorea bengalensis (Wall.) O. Ktze., Rev. Gen. Pl. 1: 42. 1891; S.P. Banerjee & B.B. Pramanik, Fasc. Fl. Ind. 12: 5. 1983 & in B.D. Sharma & N.P. Balakr., Fl. India 2: 348. 1993; K. Vivek. in P. Daniel, Fl. Kerala 1: 253. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 118. 2009. *Alsodeia bengalensis* Wall., Trans. Med. Soc. Calcutta 7: 224. 1835. *Rinorea zeylanica* (Arn.) O.Ktze., Rev. Gen. Pl. 1: 42. 1891; M. Mohanan & Henry, Fl. Thiruvanthapuram 59. 1994. *Pentaloba zeylanica* Arn., Mag. Zool. Bot. 2: 543. 1837. *Alsodeia zeylanica* (Arn.) Thw., Enum. Pl. Zeyl. 21.1858; Hook. f., Fl. Brit. India 1:187.1872; Gamble, Fl. Pres. Madras 49(35).1915.

Shrubs or small trees; branchlets glabrous or puberulous. Leaves simple, alternate, 6-18 x 2-9 cm, elliptic-lanceolate or ovate, obtuse at apex, acute at base, crenate or serrate at margin, thin-coriaceous, glabrous except for bearded nerve axils beneath, greenish when dry; midnerve prominent; lateral nerves 10-12 pairs; petioles to 1 cm long; stipules appressed, linear-lanceolate to subulate, 5-8 x ca 1 mm, distinctly striate. Flowers fascicled, ca 4 mm across; pedicels to 1 cm long; bracts basal, ovate, subacute, ca 1 mm long, brown. Sepals subequal, broadly ovate, ca 2 x 1 mm, ciliate. Petals subequal, oblong-ovate, ca 5 x 1 mm, fleshy, white. Stamens inserted on a thick 5-lobed disc, glabrous; filaments short, broad at base cohering into a tube; anthers free, oblong; appendage subapical, broad, hooded. Ovary oblong, sometimes hairy, 3-ovuled; style short, straight, glabrous. Capsules globose, to 1 cm, glabrous, 3-valved, dehiscing longitudinally; seeds 3 or 4, globose, ca 5 mm, glabrous.

Kariyankappu, *KVB 31215*

Fl. & Fr.: November-May

Distribution: Fairly common in plantations of Kariyenkappu and Evergreen forests of Meenmutty and Kattikari.

VIOLA L., Sp. Pl. 933. 1753.

Viola pilosa Blume, Cat. Gew. Buitenz. 57. 1823; S.P. Banerjee & B.B. Pramanik, Fasc. Fl. Ind. 12: 30. 1983 & in B.D. Sharma & N.P. Balakr., Fl. India 2: 371. 1993; K. Vivek. in P. Daniel, Fl. Kerala 1: 256. 2005. *Viola serpens* Wall. ex Ging. in DC., Prodr. 1: 296. 1824; Hook. f., Fl. Brit. India 1: 184. 1872; Gamble, Fl. Pres. Madras 48(35). 1915. *Viola wightiana* Wall. ex Wight, Ic. t. 943. 1845.

Prostrate herbs, rooting at nodes. Leaves simple, mostly alternate, 3.5-6 x 3.5-6 cm, ovate, apex acute, base deeply cordate, hirsute, margins crenate; petiole to 15 cm, hairy, stipules foliaceous, 1 cm. Flowers solitary, white; pedicels to 10 cm, hairy. Sepals 7 mm, lower lanceolate, hairy. Petals 1 cm, subequal, longer one obovate, spurred at the base, 6 mm. Anthers 2 mm, oblong, connective produced above. Ovary 2 mm, ovoid, puberulus, style 2 mm, stigma lateral.

Ambalappara, KJD26341; NS & KVB 31347

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Ambalappara.

FLACOURTIACEAE

- 1a. Petals present 2
- 1b. Petals absent 3
- 2a. Trunk unarmed; fruit hard rinded globose berry, over 4 cm across...Hydnocarpus
- 2b. Trunk armed with branched thorns; fruit a fleshy berry, less than 2 cm across Scolopia
- 3a. Trunk unarmed; flowers bisexual; fruit dehiscent Casearia
- 3b. Trunk armed with thorns; flowers unisexual; fruit indehiscent..... Flacourtia

CASEARIA N.J. Jacquin, Enum. Pl. Carib. 4: 21. 1760.

- 1a. Leaves tomentose, margins crenate serrate *C. wayanadensis*
- 1b. Leaves glabrous, margins entire or subentire 2
- 2a. Branchlets often zig-zag; stamens 10 *C. ovata*
- 2b. Branchlets not zig-zag; stamens 8 *C. thwaitesii*

Casearia ovata (Lam.) Willd., Sp. Pl. 2: 629. 1799; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 399. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 264. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 120. 2009. *Anavinga ovata* Lam., Encycl. 1: 148. 1789. *Casearia esculenta* Roxb., Fl. Ind. 2: 422. 1832; Hook. f., Fl. Brit. India 2:592. 1879,p.p; Gamble, Fl. Pres. Madras 521(367). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 49. 1988; Mohanan & Sivad., Fl. Agasthyamala 73. 2002.

Trees, to 10 m, bark grey, mottled with green; young shoots glabrous. Leaves simple, alternate, distichous, 7-16 x 4-7 cm, elliptic-oblong, elliptic-obovate, elliptic-ovate, obovate or ovate, apex acuminate, base acute or rounded, margin entire or distantly serrate; petiole 6-20 mm, slender, glabrous, slightly grooved above, glabrous, chartaceous; midrib red, pellucid gland dotted; lateral veins 6-8 pairs, pinnate, prominent, intercostae reticulate, faint; stipules small, scale-like, lateral, cauducous. Flowers small, bisexual, greenish, in axillary fascicles. Ccalyx 4-5 lobed, glabrous. Petals

absent. Stamens 8-10, united into a short tube with alternating staminodes, forming a ring attached below to the calyx tube, tufted at their apex. Ovary ovoid, 1-celled; style simple. Fruit a succulent capsule to 1.5 cm long, orange yellow; seeds many.

Bhoothakallu, *NS &KVB 31399*

Fl. & Fr.: January-May

Distribution: Fairly common in Semi-evergreen forests of Narikkadavu, Valayamchal and Bhoothakallu.

Casearia thwaitesii Briq., Ann. Cons. Jard. Bot. Geneve 62. 1898; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 397. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 266. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 122. 2009. *Casearia coriacea* Thw., Enum. Pl. Zeyl. 20. 1858; Gamble, Fl. Pres. Madras 521(368). 1919 non Vent. 1803.

Trees to 12 m tall; bark yellowish-white, smooth, lenticellate. Leaves simple, alternate, distichous, 3.5-9 x 2-4.5 cm, obovate, apex obtuse or obtusely acute, base cuneate or attenuate, margin entire, glabrous above, glaucous beneath, subcoriaceous, pellucid gland dotted; lateral veins 5-6 pairs, pinnate, intercostae reticulate, slender, prominent; petiole 5-15 mm, slender, glabrous, red when young; stipules small, lateral, cauducous. Flowers bisexual, small, 5 mm across, greenish-yellow, 3-6 together in axillary fascicles. Calyx 4 lobed; lobes obovate, obtuse, persistent. Petals absent. Stamens 8, alternating with as many staminodes, forming a ring attached below to the calyx tube, tufted at their apex; filaments 1.5 mm long, subulate, pubescent. Ovary terete, 1-celled, ovules 4; style simple. Fruit a succulent capsule, ovoid, smooth, greenish-yellow; seeds many.

Ambalappara, *KJD 18764*

Fl. & Fr.: January-March

Distribution: Rare in Evergreen forests of Ambalappara.

Casearia wynadensis Bedd., Ic. t. 160. 1868-1874; Hook. f., Fl. Brit. India 2: 594. 1879; Gamble, Fl. Pres. Madras 521(368). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 49. 1988; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 399. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 267. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 121. 2009.

Small trees to 7 m; branchlets pubescent. Leaves simple, alternate, 7-18 x 3-5.5 cm, lanceolate or oblanceolate, apex acuminate, base acute, margin entire or serrate, tomentose, pellucid transparent glands, membranous; lateral nerves 7-10 pairs, slender, pinnate, puberulent; intercostae reticulate, rufous villous stipules small, lateral, cauducous; petiole 4-10 mm, slender, tomentose. Flowers bisexual, small, greenish, 6-8 fascicled on axils of older leaves; peduncle 4 mm long, pubescent. Calyx 3 mm long, lobes 4, ovate, glabrous within. Petals absent. Stamens 8, hairy, 2 mm long, alternating with staminodes, tufted at their apex, forming a ring attached below to the calyx tube. Ovary oblong, 1-celled, ovules many; style to 3 mm, simple, hairy; stigma 4 lobbed. Fruit a capsule, small, 2-2.5 x 1 cm, oblong, greenish-yellow, 3-valved.

Ambalappara, *NS &KVB 31425*

Fl. & Fr.: April-June

Distribution: Fairly common in Evergreen forests of Ambalappara.

Endemic to Western Ghats; Conservation status: Vulnerable.

FLACOURTIA Commerson ex L' Heritier, de Brutelle Stirp. Nov. 59. 1786.

Flacourtia montana Graham, Cat. Pl. Bombay 10. 1839; Gamble, Fl. Pres. Madras 54(39). 1915; Ansari, Fl. Kasaragod Div. 65. 1985; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 406. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 271. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 122. 2009.

Thorny trees to 8 m, thorns about 5 cm long, bark grey, thin, smooth. Leaves simple, alternate, spiral, 12-22 x 6-8, ovate, elliptic, apex acute or acuminate, base acute or rounded, margin crenate-serrate, coriaceous, glabrous except midrib below, shining above; 3-5 nerves from the base, prominent, lateral veins 4-6 pairs, pinnate, prominent, intercostae scalariform, slender, prominent; petiole 5-10, stout, glabrous. Flowers unisexual, small, in axillary congested pubescent cymes. Sepals 4 or 5 tomentose, small, imbricate. Petals absent. Stamens many; anthers versatile. Ovary superior, urn shaped, glabrous, incompletely 2-5 locular, ovules 2 in each cell; styles 5, reflexed, notched at tip. Fruit a berry, globose, obtusely ribbed, 1-1.5 cm across, bright red, of an agreeable acid flavour; seeds few, reddish.

Narikkadavu, *KJD 26381*

Fl. & Fr.: April-June

Distribution: Rare in Semi-evergreen forests of Narikkadavu and Uruppukunnu. Endemic to India

HYDNOCRYPUS Gaertner, Fruct. 1: 288, t. 60, 1788.

1a. Leaf margins entire; scale as long as the petal..... *H. alpina*

1b. Leaf margins serrate; scale half the length of petal..... *H. pentandra*

Hydnocarpus alpina Wight, Ic. t. 942. 1845; Hook. f., Fl. Brit. India 1: 197. 1872; Gamble, Fl. Pres. Madras 52(37). 1915; Manilal & Sivar., Fl. Calicut 36. 1982; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 418. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 275. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 123. 2009. *Hydnocarpus pendula* Manilal et al., Trop. Plant. Sci. Res. 1: 35. 1983; Balakr. in Daniel, Fl. Kerala 1: 276. 2005.

Trees to 15 m; bark 5-6 mm thick, smooth, greyish-brown, slightly rough; branchlets puberulus. Young leaves copper red. Leaves simple, alternate, drooping, 8-25 x 5-10 cm, ovate, elliptic-oblong or ovate-lanceolate, apex acute or acuminate, base oblique, round or acute, margin entire, glabrous, glossy, coriaceous; lateral nerves 7-10 pairs, pinnate, slender, prominent, intercostae reticulate, prominent; petiole 5-10 mm, stout, swollen tipped, grooved above and glabrous; stipules lateral, deciduous. Flowers unisexual 22-25 mm across, yellowish-white, solitary or in stout axillary fascicles; pedicel 1. 5-2 cm long, deflexed, pubescent. Sepals 5, 8 mm long, oblong, pubescent, imbricate. Petals 5, 1 cm long, narrow, glabrous, with a scale at the base; scales linear, as long as petals, sparsely hairy. Stamens 5-15; filaments glabrous; connectives broad; ovary 1-celled, tomentose, stigmas 5, free, radiating, recurved. Fruit a berry, 5-7 cm across, densely tomentose, dark brown.

Crossway, *KJD 26074*

Fl. & Fr.: January-July

Distribution: Fairly common in plantations of Kariyenkappu and Evergreen forests of Crossway.

Hydnocarpus pentandra (Buch.-Ham.) Oken, Allg. Naturf. 3: 1381. 1841; Ramach. & V.J. Nair, Fl. Cannanore Dist. 50. 1988; Ansari, Fl. Kasaragod Div. 65. 1985; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 422. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 276. 2005; Ratheesh Narayanan, Fl.

Stud. Wayanad Dist. 124. 2009. *Chilmoria pentandra* Buch.-Ham., Trans. Linn. Soc. London 13. 501. 1822. *Hydnocarpus laurifolia* (Dennst.) Sleum. in Engl., Bot. Jahrb. Syst. 69: 33. 1938. *Hydnocarpus wightiana* Blume, Rumph. 4: 22. 1848; Hook. f., Fl. Brit. India 1: 196. 1872; Gamble, Fl. Pres. Madras 52(37). 1915.

Dioecious trees, to 25 m high, bole fluted; bark 4-5 mm thick, surface pale brown mottled with white patches, smooth, brittle; branchlets pubescent. Leaves simple, alternate, 8-17 x 3-8 cm, elliptic, elliptic-lanceolate or elliptic-oblong, apex acuminate, base acute, obtuse or round, margin crenate, serrate or entire, glabrous, coriaceous; lateral nerves 6-8 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole 8-10 mm, stout, pubescent, grooved above; stipules small, lateral, cauducous. Flowers unisexual, 5-10 mm across, greenish-yellow, solitary or in small fascicle. Sepals 5, broadly ovate, pubescent. Petals 5, broadly ovate, greenish-yellow, fringed with soft white hairs, with a scale at the base; scales half as long as petals, densely hairy. Stamens 5-15; filaments subulate, hairy at the base; anthers of female flowers possess no pollen; ovary globose, 1-celled, tomentose; stigma sessile and two lobbed. Fruit a berry 5-7 cm across, globose, rind thick, brown, rough with uneven surface; seeds numerous, yellowish, obtusely angular.

Chavachi, NS & KVB 31316

Fl. & Fr.: December-May

Distribution: Common at all forest types below 800 m altitude.

Endemic to Western Ghats.

SCOLOPIA Schreber, Gen. 335. 1789.

Scolopia crenata (Wight & Arn.) Clos, Ann. Sci. Nat. Bot. ser. 4, 8: 250. 1857; Hook. f., Fl. Brit. India 1: 191. 1872; Gamble, Fl. Pres. Madras 52(38). 1915; Sleumer, Blumea 20: 39. 1972; Ramach. & V.J. Nair, Fl. Cannanore Dist. 50. 1988; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 430. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 278. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 124. 2009. *Phoberos crenatus* Wight & Arn., Prodr. 29. 1834.

Evergreen trees, to 15 m high, armed with thorns, spines often branched; bark greyish-brown, flaking off in irregular thick scales; blaze yellow with pink tinge; branchlets with transverse lenticels. Leaves simple, alternate, 5-14 x 2.5-6 cm, lanceolate, elliptic-lanceolate, ovate or obovate, apex abruptly acuminate, caudate-acuminate or acute, base rounded or acute, margin crenate or serrate, glabrous, coriaceous, 3-5-ribbed from the base; lateral nerves 3-8 pairs, pinnate, faint, intercostae reticulate, faint; petiole 8-15 mm, slender, glabrous. Flowers bisexual, 1.5 cm across, white, in axillary racemes of 5-7 cm long; rachis ferruginous tomentose; pedicel 6 mm long, puberulus. Sepals 4-6, 3 x 2 cm, ovate, ciliate. Petals 4-6, 1.5 mm long, oblong, glabrous. Stamens numerous, free; anthers 1 mm long; connective produced into a reddish hood; disc extra-staminal, glandular pubescent. Ovary one celled, few ovuled; style 4 mm long, thick, grooved; stigma 3-fid. Fruit a berry, globose, 10 x 8 mm across, with persistent style; seeds few.

Ambalappara, KVB 31717; NS & KVB 31370

Fl. & Fr.: October-May

Distribution: Fairly common in Evergreen forests of Ambalappara.

PITTOSPORACEAE

PITTOSPORUM Banks ex Solander in Geartner, Fruct. 1: 286, t. 59. 1788.

Pittosporum tetraspermum Wight & Arn., Prodr. 154. 1834; Hook. f., Fl. Brit. India 1: 198. 1872; Gamble, Fl. Pres. Madras 55(40). 1915; M.P. Nayar & G.S. Giri in B.D. Sharma & N.P. Balakr., Fl. India 2: 447. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 286. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 126. 2009.

Large shrubs, to 2 m tall; bark rough, grey outside, pungent smelling when cut, granular. Leaves pseudovercillate towards the branch tips, 6-9 x 2-4 cm, elliptic, acute at either ends, 10-12-nerved; midrib tomentose above and below; petiole 1 cm long. Flowers in terminal sessile umbels, pedicels 5 mm long. Sepals 2.5 x 1.5 mm, ovate, obtuse, pubescent. Petals creamy-white, 12 x 3 mm, oblanceolate, clawed. Staminal filaments 6 mm long. Ovary densely hairy; style 4 mm long, glabrous. Capsule 8 x 8 mm, globose, smooth, black.

Ambalappara, NS &KJD 31950

Fl. & Fr.: December-April

Distribution: Common in Evergreen forests of Ambalappara.

POLYGALACEAE

- 1a. Trees, flowers in paniced racemes, fruit drupe Xanthophyllum
1b. Shrubs or herbs, flowers on racemes, fruit capsules Polygala

POLYGALA L., Sp. Pl. 701. 1753.

- 1a. Shrubs, leaves more than 10 cm, flowers yellow *P. arillata*
1b. Herbs, leaves less than 5 cm, flower pink *P. persicariifolia*

Polygala arillata Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 199. 1825; Hook. f., Fl. Brit. India 1: 200. 1872; Gamble, Fl. Pres. Madras 58(41). 1915; R.N. Banerjee in B.D. Sharma & N.P. Balakr., Fl. India 2: 457. 1993; R.N. Banerjee & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 291. 2005.

Shrubs to 1.5 m high. Leaves simple, alternate, 17 x 5 cm, elliptic, acuminate at apex, acute at base; nerves to 15 pairs; petiole 1 cm long. Racemes to 10 cm long. Flowers yellow; pedicels 5 mm long. Outer sepals 5 x 4 mm, ovate, obtuse; inner 14 x 8 mm, oblong, emarginated. Petals 14 mm long, crest dichotomous; wings decurrent at base. Capsule 8 x 14 mm long, compressed, glabrous, striate; seeds oblong 7 x 4 mm, biconvex; caruncle reddish.

Ambalappara, KVB 31577

Fl. & Fr.: April-December

Distribution: Rare in Evergreen forests of Ambalappara.

Polygala persicariifolia DC., Prodr. 1: 326. 1824; Hook. f., Fl. Brit. India 1: 202. 1872; Gamble, Fl. Pres. Madras 58(42). 1915; R.N. Banerjee in B.D. Sharma & N.P. Balakr., Fl. India 2: 480. 1993; R.N. Banerjee & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 300. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 128. 2009. *Polygala wallichiana* Wight, Illustr. t. 22A. 1840.

Erect herbs to 35 cm high. Leaves simple, alternate, 5 x 0.8 cm, linear-lanceolate, acuminate, glabrous. Racemes to 5 cm long, slender, pubescent, many-flowered. Flowers pink. Inner sepals 6 x 6 mm, orbicular, white; outer 3

x 2 mm, ovate. Wing petals 2 mm long, cordate at base, hairy; dorsal petal 6 x 4 mm, obovate, glabrous, crest fimbriate, 2-lobed. Capsule 4 x 3 mm, glabrous; seeds 3 x 1 mm, pubescent, caruncle 1/2 as long as the seed.

Ambalappara, KVB 31758

Fl. & Fr.: August-January

Distribution: Fairly common in Grasslands of Ambalappara.

XANTHOPHYLLUM Roxb., Pl. Coromandel 3: 81. 1820, *nom. cons.*

Xanthophyllum arnottianum Wight, Illustr. 1: 50. t.23. 1840; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 129. 2009. *Xanthophyllum flavescens* sensu Bennett in Hook.f., Fl. Brit. India 1: 209. 1874, non Roxb. 1814; Gamble, Fl. Pres. Madras 59(42). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 51. 1988; R.N. Banerjee & N.P. Balakr. in B.D. Sharma & N.P. Balakr., Fl. India 2:497.1993 & in P. Daniel, Fl. Kerala 1: 307. 2005. *Xanthophyllum angustifolium* Wight, Ill. 1:50. t. 23.1840; Mohanan, Fl. Quilon Dist. 75. 1984.

Trees, to 10 m high, bark 5-6 mm thick, greenish-grey, smooth, semi-fibrous; branchlets puberulus. Leaves simple, alternate, spiral, 5-15 x 2.5-7.5 cm, oblong, ovate-lanceolate or oblong-lanceolate, base acute or obtuse, apex acuminate, margin entire, glabrous, coriaceous; lateral nerves 5-7 pairs, pinnate, prominent, intercostae reticulate, prominent; petiole 4-7 mm, slender, glabrous. Flowers bisexual, in terminal or axillary paniced racemes, yellowish-white. Sepals 5, subequal, suborbicular, finely tomentose. Petals 5, yellow, unequal, lower boat-shaped. Stamens 8; filament free, 2 hypogynous, to the base of petals in pairs, others adnate to the base of the petals; disc 5-lobed. Ovary superior, stipitate, globose, densely strigose, 1-celled, ovules 4, 2 erect and 2 pendulous; style curved. Fruit a drupe, 12-18 mm across, globose, green, rugose, 1-seeded.

Kariyenkappu, KJD 31497

Fl. & Fr.: Throughout the year

Distribution: Common in plantations of Kariyenkappu and Evergreen forests of Chavachi and Moonamthode. Endemic to Western Ghats.

PORTULACACEAE

TALINUM Adanson, Fam. 2: 245. 1763.

Talinum portulacifolium (Forssk.) Aschers & Schweinf, Weinf., Bull. Herb. Boiss. 4. App. 172. 1896; Manilal & Sivar., Fl. Calicut 40. 1982; M.K.V. Rao in B.D. Sharma & Sanjappa, Fl. India 3: 9. 1993; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 319. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 131. 2009. *Orygia portulacifolia* Forssk., Fl. Aeg.-Arab. 103. 1775. *Portulaca cuneifolia* Vahl, Symb. Bot. 1: 33. 1790. *Talinum cuneifolium* (Vahl) Willd., Sp. Pl. 2: 864.1799; Hook. f., Fl. Brit. India 1: 247. 1874; Gamble, Fl. Pres. Madras 66(48). 1915. *Talinum indicum* Wight & Arn., Prodr. 356. 1834.

Erect semi-succulent, glabrous herbs to 1 m tall; rootstock tuberous. Leaves sessile, alternate, 4-8 x 1.5-3 cm, obovate or oblanceolate, base cuneate, apex obtuse or rounded. Inflorescence terminal, paniculate. Flowers 1.5-2 cm across; pedicels to 1.2 cm long; bracts 2-4 mm long, linear. Sepals 2, 4-6 x 2-3 mm, ovate-lanceolate, acuminate. Petals 5, pink, 8-10 x 4-5 mm, obovate. Stamens many; filaments unequal. Ovary c. 2 mm long, globose, 1-loculed; styles 3-armed. Capsules 4-6 mm across, globose; seeds ovoid, black, striate.

Fl. & Fr.: February-August

Distribution: Rarely found in earlier settlements.

HYPERICACEAE

HYPERICUM L., Sp. Pl. 783. 1753.

- 1a. Stout shrubs; style 5, flowers 5 cm across *H. mysurense*
1b. Slender herbs; style 3, flowers 1 cm across 2
2a. Leaves sagittate at base, ribbed from base *H. japonicum*
2b. Leaves rounded at base, penninerved *H. wightianum*

Hypericum japonicum Thunb. ex Murr. in L., Syst. Veg. 702. 1784; Hook. f., Fl. Brit. India 1: 256. 1874; Gamble, Fl. Pres. Madras 70(51). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 53. 1988; S.N. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 69. 1993; K.Vivek. in P. Daniel, Fl. Kerala 1: 326. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 132. 2009.

Erect herbs. Leaves, simple, opposite, decussate, 8-10 x 4 mm, lanceolate, apex acute, base auricled, 3-ribbed, glabrous. Flowers solitary axillary or in terminal cymes; yellow, pedicels 5 mm long. Sepals 3 x 1 mm, oblong, obtuse, many-ribbed. Petals yellow, 4 x 1.5 mm, oblong. Stamens many, free. Ovary 1-celled, ellipsoid, styles 3, 1 mm long. Capsule 3 x 2 mm, smooth; seeds many, 0.5 x 0.3 mm, oblong 7-ribbed.

Ambalappara, *KJD 31498*

Fl. & Fr.: December-July

Distribution: Fairly common in Evergreen forests of Ambalappara near small streams and water bodies.

Hypericum mysurense Heyne ex Wight & Arn., Prodr. 99. 1834; Hook. f., Fl. Brit. India 1: 253. 1874; Gamble, Fl. Pres. Madras 70(50). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 53. 1988; S.N. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 71. 1993; K.Vivek. in P. Daniel, Fl. Kerala 1: 326. 2005. *Norisca mysurensis* (Heyne ex Wight & Arn.) Wight, Ic. t. 56. 1838.

Shrubs. Leaves simple, opposite, decussate, 20-30 x 7 mm, lanceolate, acute at both ends, closely placed, sessile; nerves 2 or 3 pairs, glabrous. Flowers yellow, 5-6 cm across, in terminal cymes, 2-3 together. Sepals to 1 cm long, lanceolate. Petals yellow, 2-2.5 x 1 cm, obovate, obtuse, glabrous. Stamens arranged in 5 bundles, filaments 1 cm long. Ovary 5-celled, styles 5, 10 mm long. Capsule 15 mm long, glabrous.

Ambalappara, *KVB 31749*

Fl. & Fr.: Throughout the year

Distribution: Common in Grasslands of Ambalappara.

Hypericum wightianum Wall. ex Wight & Arn., Prodr. 99. 1834; Gamble, Fl. Pres. Madras 70(50). 1915; S.N. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 78. 1993; K.Vivek. in P. Daniel, Fl. Kerala 1: 327. 2005. *Hypericum napaulense* sensu Dyer in Hook. f., Fl. Brit. India 1: 256. 1874, p.p. non Choisy 1824. *Hypericum humifusum* sensu Dyer in Hook. f., Fl. Brit. India 1: 255. 1874, p.p. non L. 1753; Gamble, Fl. Pres. Madras 70(51). 1915; S.N. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 67. 1993; Sasidh., Fl. Periyar Tiger Reserve 23. 1998.

Diffuse herbs; stems reddish. Leaves simple, opposite, spiral, 12 x 7 mm, oblong, obtuse at apex, rounded at base, purplish coloured; nerves 2-3 pairs. Flowers in terminal cymes, 2 or 3 together yellow. Sepals 4 x 2.5 mm, oblong, acute. Petals yellow, 5 mm long, obovate, obtuse. Stamens 3-adelphous. Ovary glabrous, styles 3, 3 mm long. Capsule 4.5 x 3 mm, ellipsoid; seeds 0.8 x 0.4 mm, oblong, not ribbed, epidermal cells transversally oblong in vertical rows.

Ambalappara, *KJD* 26321

Fl. & Fr.: Through out the year

Distribution: Fairly common in open areas in the Evergreen forests of Ambalappara.

CLUSIACEAE/ GUTTIFERAE

- 1a. Flowers solitary axillary, fascicled or in short spikes 2
- 1b. Flowers in racemes or panicles 3
- 2a. Flowers over 4 cm across, white; lateral nerves indistinct..... Mesua
- 2b. Flowers less than 2 cm across, yellow or creamy; lateral nerves distinct.. Garcinia
- 3a. Lateral nerves indistinct; petals 5 or 6..... Poeciloneuron
- 3b. Lateral nerves distinct; petals 4..... Calophyllum

CALOPHYLLUM L., Sp. Pl. 783. 1753.

- 1a. Perianth segments 4 only *C. calaba*
- 1b. Sepals and petals 4 each..... 2
- 2a. Fruit slightly beaked, young parts and inflorescence pubescent .. *C.austro-indicum*
- 2b. Fruit not beaked, whole trees glabrous *C. polyanthum*

Calophyllum austroindicum Kosterm. ex Stevens, J. Arnold Arbor. 61: 250. 1980; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 90. 1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 330. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 133. 2009. *Calophyllum trapezifolium* sensu Anders. in Hook.f., Fl. Brit. India 1: 275. 1874, non Thw. 1858; Gamble, Fl. Pres. Madras 76 (55). 1915; Mahesh., Bull. Bot. Surv. India 2: 144. 1960.

Tree, 15-30 m tall; bark pale brown to yellowish; branchlets usually 4-angled; young branches minutely rusty-pubescent. Leaves simple, opposite, 3-8.5 x 1.2-4.2 cm, elliptic, subrhomboid to obovate or oblanceolate, subacute or shortly and bluntly acuminate at apex, cuneate to acute at base, slightly undulate, recurved and margined, rounded, retuse, rigid, sometimes olivaceous; midnerve channelled above, raised beneath; lateral nerves 5-10(-15) pairs, more or less prominent on both surfaces; petioles (3-) 5-8 mm long, channelled above, glabrous or minutely rusty-pubescent. Racemes axillary, 3-8 cm long, 7-17 flowered, glabrous; peduncles 3-7.5 cm long, glabrous. Flowers bisexual, ca 2 cm across; pedicels 6-15 mm long, glabrous. Sepals 4, subequal; outer pair suborbicular, 3.7-5 x 3.5-6 mm; the inner broadly elliptic, ca 6 x 4 mm. Petals 4, rarely 6, elliptic or oblong to obovate, obtuse, 4-9 x 1.5-6 mm. Stamens 100-125; filaments ca 4.5 mm long; anthers elliptic to oblong, cordate, truncate or oblique at base, 0.7-1.3 x 0.4-0.8 mm. Ovary globose, 2-3 mm; styles 1.5-3.5 mm long; stigmas peltate, 3-radiate, 0.7-1 mm across. Berries ovoid, beaked at apex, 3-4.3 x 1.6-2.7 cm; stone ellipsoid, ca 2.5 x 1.5 cm, smooth; stalks 1.2-1.7 cm long.

Ambalappara, *NS &KVB* 31362

Fl. & Fr.: November-June

Distribution: Common in Evergreen forests of Pothurumi and Ambalappara.

Endemic to southern Western Ghats.

Calophyllum calaba L., Sp. Pl. 514. 1753; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 330. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 133. 2009. *Calophyllum apetalum* Willd., Ges. Naturf. Fr. Berlin Mag. 5: 79. 1811; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3:88.1993. *Calophyllum decipiens* Wight, Ic. t. 106. 1839; Gamble, Fl. Pres. Madras 76(54). 1915. *Calophyllum wightianum* Wall. ex Planch. & Triana, Ann. Sci. Nat. Bot. ser. 4. 15: 256. 1862; Hook. f., Fl. Brit. India 1: 274. 1874.

Trees, to 20 m high, bark 15-18 mm thick, surface yellowish-brown, reddish-brown inside rough, deeply fissured; branchlets slender, quadrangular, finely, minutely tomentellous to almost glabrous. Leaves simple, opposite, decussate, 5-11 x 3-5 cm, obovate, ovate-oblong or oblong, apex retuse or obtuse, base acute, cuneate, cuneate-subacute or cuneate-round, margin entire, glabrous, coriaceous; lateral nerves many, parallel, very close, slender, prominent, intercostae obscure; petiole 4-12 mm long, stout, minutely tomentellous, glabrescent or glabrous, canaliculated above. Flowers bisexual, white, 10-12 mm across, in axillary panicles; peduncle densely rusty pubescent, 5-10 mm long, slender; pedicels 5-20 mm long, with small deciduous bracts at the base, glabrous or sparsely pubescent. Sepals 4, white, 8 x 5 mm oblong or obovate, concave, sometimes slightly pilose outside, inner ones thinner, narrower, up to 7 mm long. Petals absent. Stamens numerous, filaments 4-6 mm long, slender; anthers large. Ovary superior, globose, 1-celled, ovule 1, erect; style slender, 3 mm long; stigma peltate, concave. Fruit a drupe, 10-12 mm, ovoid, bright orange or yellowish-orange; pericarp thin, pleasantly sweet, edible; seed ovoid to ellipsoid, pale brown.

Valyamchal, KJD 18754

Fl. & Fr.: September-May

Distribution: Rare in Semi-evergreen forests of Valayamchal near river banks.

Endemic to Western Ghats

Calophyllum polyanthum Wall. ex Choisy, Descr. Guttif. Ind. 43. 1849; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 94. 1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 333. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 134. 2009. *Calophyllum elatum* Bedd., Fl. Sylv. t. 2. 1869; Gamble, Fl. Pres. Madras 76(54). 1915. *Calophyllum tomentosum* sensu Hook. f., Fl. Brit. India 1: 274. 1874, non Wight 1839.

Lofty trees, to 35 m high, bole straight, sometimes with small buttresses; bark 15-16 mm thick, surface yellowish-brown, deeply spirally fissured; branchlets subquadrangular, minutely brown tomentose. Leaves simple, opposite, decussate, 8-12.5 x 3-8 cm, elliptic, elliptic-lanceolate, apex acute or acuminate, base acute, margin entire, glabrous, shining, coriaceous; lateral nerves many, slender, parallel, close, prominent, intercostae obscure; petiole 12-25 mm long, slender, grooved above, glabrescent. Flowers bisexual, white, in panicles or racemes, terminal and from the axils of the upper leaves; peduncle slender; pedicel 1-1.5 cm long, slender, white, sparsely to densely tomentellous. Sepals 4, concave, elliptic, outer ones reflexed, ciliate, inner 2 petaloid, 7.5 mm long. Petals 4, 5 mm across, white, orbicular, early cauducous, inner ones smaller. Stamens numerous, 4 mm long; filaments

united at the base. Ovary superior, slender, 1-celled, ovule one, erect; style 2 mm long, flexuous; stigma peltate, concave, obscurely lobed. Fruit a drupe, 2-2.5 cm long, obliquely ovoid, dark purple, smooth.

Vellachatamkunnu, *KJD 22564*

Fl. & Fr.: June-September

Distribution: Common in Evergreen forests of Vellachatamkunnu and Kattikari.

GARCINIA L. Sp. Pl. 1: 443. 1753

- 1a. Flowers 5-merous; stamens in 5 phalanges..... *G. talbotii*
1a. Flowers 4-merous; stamens monodelphous..... 2
2a. Fruit smooth, less than 2 cm diameter *G. morella*
2b. Fruit vertically grooved, over 3.5 cm diameter 3
3a. Fruit apex papillate *G. gummi-gutta* var. *papilla*
3b. Fruit apex obtuse..... *G. gummi-gutta* var. *gummi-gutta*

Garcinia gummi-gutta (L.) Robs., Brittonia 20: 103. 1968, **var. gummi-gutta**; Ansari, Fl. Kasaragod Div. 70. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 54. 1988; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3:110.1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 336. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 135. 2009. *Cambogia gummi-gutta* L., Gen. Pl. (ed.5) 522. 1754. *Garcinia cambogia* (Gaertn.) Desr. in Lam., Encycl. 3: 701. 1792; Hook. f., Fl. Brit. India 1: 261. 1874; Gamble, Fl. Pres. Madras 73(53). 1915. *Mangostana cambogia* Gaertn., Fruct. 2: 106. 1790. *Garcinia cambogia* (Gaertn.) Desr. var. *conicarpa* (Wight) Anders. in Hook.f., Fl. Brit. India 1: 262. 1874; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 336. 2005. *Garcinia conicarpa* Wight, Ic. t. 121. 1839.

Evergreen trees, to 20 m high, bark 4 mm thick, black, rough, thinly scaly; blaze creamy yellow; exudation pale yellow, sticky; branchlets terete, glabrous, drooping. Leaves simple, opposite, decussate, 7-15 x 2-8 cm, elliptic or elliptic-oblongate or lanceolate, base cuneate, or attenuate, apex acute or shortly obtusely acuminate, margin entire, glabrous, coriaceous, shining; lateral 10-16 pairs, pinnate, slender, ascending, prominent, arched towards the margin forming intramarginal nerve, intercostae reticulate, faint; petiole 5-20 mm long, stout, channelled above, ligulate process at the base small, glabrous. Flowers polygamodioecious, yellowish-white; male flowers: 3-5 in short axillary fascicles; pedicels 7-15 mm long, thickened towards tip, often reflexed; sepals 4, fleshy with membranous margin, coriaceous, ovate or obovate, outer 2 smaller than inner; petals 4, twice as long as the sepals, concave with narrow membranous margin; stamens 10-20 or more, inserted on a short convex receptacle, monadelphous, forming a globular head; anthers ca. 0.5 mm long, basifixed; rudimentary pistil absent or minute; female flowers: 1-3 in terminal and axillary fascicles, larger than male flowers; pedicels 4-6 mm long; sepals and petals as in male; staminodes 10-20, filaments unequal, connate at base in a ring around the ovary or grouped in unequal bundles; anthers bilocular; ovary superior, globular, 8-10 locular, ovule one in each locule; stigmatic rays 8-10, spreading, free nearly to the base, margin tuberculate. Fruit a berry, ovoid to subglobose, 4-5 cm diameter, yellow or red, 8-10 grooved, grooves ending about the middle, pericarp very thick, fleshy; seeds 6-8, ovoid, compressed, pale brown, veined; aril succulent, white or red.

Fl. & Fr.: January-September

Distribution: Common in all forest types below 1,000 m altitude

Garcinia gummi-gutta (L.) Robs. **var. papilla** (Wight) N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 111. 1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 337. 2005. *Garcinia papilla* Wight, Ic. t. 96. 1839; Ansari, Fl. Kasaragod Div. 70. 1985. *Garcinia cambogia* (Gaertn.) Desr. **var. papilla** (Wight) Anders., Hook. f., Fl. Brit. India 1: 262.

Tree, to 25 m tall; bark rugose, grey or dark brown; exudate a yellow gum; branchlets glabrous. Leaves simple, opposite, 7-15 x 2-7 cm, oblong, elliptic or lanceolate, acute to short-acuminate at apex, cuneate at base, entire at margin; lateral nerves numerous, slender, prominent; petioles channelled, to 2 cm long. Male flowers 3-6 in short axillary fascicles, ca 1.2 cm across, pale white, yellow or yellowish pink; pedicels 7-15 mm long; sepals 4, ovate or obovate, unequal; outer pair 5-6 mm long; the inner 7-8 mm long, coriaceous, fleshy; Petals 4, obovate or oblong, 8-10 mm long, stamens 12-20 or more, inserted on receptacle; filaments ca 0.5 mm long; anthers ca 0.5 mm long, basifixed, dehiscing longitudinally; pistillode absent or minute; stigmatic lobes 3 or 4. Bisexual flowers in fascicles of 1-3, terminal and axillary, 1-1.5 cm across; pedicels 4-6 mm long; sepals and petals as in male ones; stamens 10-20; filaments unequal, connate at base in a ring around ovary or grouped in unequal bundles; ovary subglobose or ovoid, ca 1 mm long, 8-11 sulcate; berries globose, to 7 cm, (4-) 6-8 grooved, mamillate at apex, thick; seeds 6-8, ovoid, compressed, ca 3 cm long, surrounded by a succulent white or red aril.

Ambalappara, KJD 26303

Fl. & Fr.: December-February

Distribution: Fairly common in Evergreen forests of Ambalappara-Pothurumi region.

Garcinia morella (Gaertn.) Desv. in Lam., Encycl. 3: 701. 1792; Hook. f., Fl. Brit. India 1: 204. 1874; Gamble, Fl. Pres. Madras 74(52). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 55. 1988; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 119. 1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 338. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 136. 2009. *Mangostana morella* Gaertn., Fruct. 2: 106. 1790. *Garcinia pictoria* Roxb., Fl. Ind. 2:627. 1832; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 339. 2005. *Garcinia gutta* Wight, Ic. t. 44. 1840.

Evergreen trees, to 18 m high, bark 3-10 mm thick, brownish-grey or brown to dark brown, smooth; blaze dark yellow; exudation dark yellow or orange yellow, sticky; branchlets quadrangular, glabrous. Leaves simple, opposite, decussate, 6-16 x 2.5-9 cm, elliptic-obovate or elliptic-oblong, apex obtuse, obtusely acuminate or caudate-acuminate, base acute or cuneate, margin entire, glabrous, coriaceous; lateral nerves 8-16 pairs, pinnate, arched towards the margin forming intramarginal nerve, slender, prominent, intercostae reticulate, faint; petiole 6-15 mm, stout, glabrous, grooved above, thickened, very shortly ligulate at base. Flowers polygamodioecious, reddish, sessile: Male flowers: 2-4 in axillary fascicles or on old wood; sepals 4 orbicular, decussate, outer pairs smaller than the inner, glabrous; petals 4, little larger than sepals, orbicular, veined, concave; stamens 10-12, monadelphous, the filaments combined in to a subquadrangular central column, anthers red, orbicular, plurilocular; pistillode absent. Female flowers: axillary, solitary, larger than male flowers; staminodes 10-12 in a ring round the

ovary, connate at the base; ovary superior, greenish, globose, smooth, 4-celled, ovule one in each cell; stigma peltate, sessile, irregularly lobed, tubercled, persistent, margin dentate. Fruit a berry, 1.5-2.5 cm long, subglobose, or globose, smooth, yellowish or light pink, surrounded at the base by persistent sepals, crowned by flat tuberculate round stigmas, pulp sweet, acidic; seeds 2-4, kidney shaped, laterally compressed, dark brown, testa muriculate.

Paripode, KVB 31681

Fl. & Fr.: February-August

Distribution: Common in Evergreen forests of Katikari, Chavachi and Moonamthode and Semi-evergreen forests of Paripode and Narikkadavu.

Garcinia talbotii Raiz. ex Sant., Rec. Bot. Surv. Ind. 16:14. 1960; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 127. 1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 343. 2005. *Garcinia ovalifolius* (Roxb.) Hook.f. var. *macrantha* Anders. in Hook.f., Fl. Brit. India 1: 269. 1874. *Garcinia malabarica* Talbot, Journ. Bombay Nat. Hist. Soc. 11: 234. t. 1. 1897, non Desr. 1789; Gamble, Fl. Pres. Madras 74(53). 1915. *Xanthochymus ovalifolius* Graham, Cat. Pl. Bombay 26. 1839, non Roxb. 1832.

Tree, to 15 m tall; branchlets angled, swollen at nodes; latex brownish. Leaves simple, opposite, 7-18 x 4-10 cm, elliptic-oblong or ovate, obtuse or retuse at apex, rounded at base, entire at margin, coriaceous; lateral nerves 16-18 pairs or more, distinct; petioles 12-18 mm long, rugose. Inflorescences congested, often an old wood. Flowers 1.8-2.7 cm across, creamy white or white to greenish yellow; pedicels 5-12 mm long; bracteoles many, minute, at base of pedicel. Sepals 5, orbicular, ca 3 mm, green. Petals 5, orbicular to suborbicular, concave, 5-10 mm across, white. Male flowers: Stamens in 5 phalanges, opposite petals; anthers 8-12 in each phalange, didymous, reddish; pistillode absent. Female flowers: Stamines in 5 thin flat phalanges; anthers 4 or 5 in each phalange, flat, didymous; ovary globose, 3 or 4 loculed; stigmatic lobes 3, thick, spreading; berries broadly oblong, 4-6 cm across, with abundant yellow latex.

Paripode, KVB 31278

Fl. & Fr.: November-May

Distribution: Fairly common in Evergreen forests of Katikari and Semi-evergreen forests of Paripode. Endemic to Western Ghats

MESUA L., Sp. Pl. 515. 1753.

Mesua ferrea L., Sp. Pl. 515. 1753, var. **ferrea**; Hook. f., Fl. Brit. India 1: 277. 1874; Gamble, Fl. Pres. Madras 77(55). 1915; Ansari, Fl. Kasaragod Div. 71. 1985; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3:136.1993; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 349. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 137. 2009. *Mesua nagassarium* (Burm. f.) Kosterm., Ceylon J. Sci. 12, 1: 71. 1976; Ramach. & V.J. Nair, Fl. Cannanore Dist. 55. 1988; Anil Kumar et al., Fl. Pathanamthitta 72. 2005.

Trees; bark ash or grey coloured, reddish when cut. Leaves red and pendulous when young, simple, opposite, 8-12 x 2-4.5 cm, elliptic to oblong-lanceolate, base broadly attenuate or rounded, apex acuminate or cuspidate, coriaceous, shiny above, glaucous beneath and generally covered with a wax-like white powder beneath; nerves many, close and parallel; petiole to 1 cm long. Flowers white, scented, solitary or in pairs at axils, bisexual, 4.5-5.5 cm, across. Sepals 4 in two pairs, 1.3-1.6 cm long, broadly ovate, persistent. Petals 4, sometimes 5, white with brown veins, 2.5-3.5 x 1.3-1.5 cm, obovate or

obcordate, margins curled. Stamens numerous; anthers yellow. Ovary 4-6 mm long, ovoid; ovules 2 in each locule; stigma peltate. Fruits 2-2.5 x 1.5-2 cm, ovoid; seeds 1-4, pyriform, dark brown.

Meenmutty, *KJD 25598*

Fl. & Fr.: April-July

Distribution: Upper reaches of Evergreen forests at Meenmutty.

POECILONEURON Beddome, J. Linn. Soc. 8: 267. 1865.

Poeciloneuron indicum Bedd., J. Linn. Soc. Bot. 8: 267, t.17. 1865 & Fl. Sylv. t.3. 1869; Hook. f., Fl. Brit. India 1: 278. 1874; Gamble, Fl. Pres. Madras 77(56). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 55. 1988; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 146. 1993; Mohanan et al., Ann. For. 7: 87. 1999; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 352. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 138. 2009.

Large evergreen trees; to 30 m high; bark 5-6 mm thick, grey to brown, rough; bole straight, buttressed some times with stilt root; exudation milky yellow, scanty; branchlets terete. Leaves simple, opposite, 11-25 x 2.5-6.5 cm, elliptic, elliptic-oblong or linear-oblong, apex caudate acuminate, base acute or obtuse, margin entire, glossy, areolate, glabrous, coriaceous; lateral nerves many, close, parallel, slender, obscure; intercostae reticulate; petiole 10-30 mm, stout, glabrous, grooved above. Flowers bisexual, yellowish-white, fragrant, in axillary and terminal panicles; pedicels 1-2 cm, puberulous; bracteoles triangular. Sepals 5, 3 mm long, ovate, puberulous without. Petals 5, 5-6 mm, elliptic to obovate. Stamens numerous, free or slightly connate; filaments 0.5 mm long; anthers 3.5 mm, erect. Ovary 1-2 mm, bilocular; ovules 2 in each locule; styles 2, subulate. Fruit a capsule, 2-2.5 cm across, globose, beaked, pink, 1-celled; seed one, fleshy.

Pothurumi, *KJD 26287*

Fl. & Fr.: December-June

Distribution: Rare in Evergreen forests of Pothurumi. Endemic to Western Ghats

THEACEAE

- 1a. Leaf tip acute; stamens to 10..... Eurya
2b. Leaf tip obtuse; stamens numerous Gordonia

EURYA Thunberg, Nova Gen. Pl. 67. 1783.

Eurya nitida Korth. in Temminck, Verh. Nat. Gesch. Bot. 3: 115. t.17. 1840; Ramach. & V.J. Nair, Fl. Cannanore Dist. 56. 1988; A.S. Chauhan & T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 184. 1993; K. Vivek. in P. Daniel, Fl. Kerala 1: 355. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 138. 2009. *Eurya japonica* Thunb. var. *thunbergii* Thw., Enum. Pl. Zeyl. 41. 1858; Hook. f., Fl. Brit. India 1: 284. 1874. *Eurya japonica* Thunb. var. *nitida* (Korth.) Dyer in Hook.f., Fl. Brit. India 1: 284. 1874.

Evergreen trees, to 8 m high, bole striate; bark brown. Leaves simple, alternate, 2-7.5 x 1-3 cm, elliptic or elliptic-oblong, apex subacute, base acute or cuneate, margin serrate, coriaceous, glabrous; petiole 1-7 mm, slender, glabrous, grooved above; lateral veins 4-9 pairs, pinnate, prominent, intercostae reticulate, prominent, secondary laterals also prominent. Flowers unisexual, white or greenish-white, 2 or more in axillary fascicles, rarely solitary; pedicel 1-2.5 mm long; bracteoles 2 at the base of calyx. Calyx lobes 5, broadly ovate to orbicular, glabrous, ciliate. Petals 5, broadly oblong to orbicular, connate at base, imbricate.

Stamens 12-15, connate at base, adnate to the base of petals, anthers apiculate. Ovary superior, globose, glabrous, 3-celled, ovule many in each cell; styles 3, 1.5-2.5 mm long, united basely; stigmas 3-lobed. Fruit a berry, 3-5 mm across, globose, black; seeds small, many, dark brown, angular, reticulate.

Ambalappara, KVB 31768, 31569

Fl. & Fr.: Mar-February

Distribution: Fairly common along the marginal area of Evergreen forests at Ambalappara.

GORDONIA J. Ellis, Phil. Trans. 60: 520. 1771, *nom. cons.*

Gordonia obtusa Wall.ex Wight & Arn., Prodr. 87. 1834; Hook. f., Fl. Brit. India 1: 291. 1874; Gamble, Fl. Pres. Madras 79(57). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 56. 1988; A.S. Chauhan & T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 162. 1993; K. Vivek. in P. Daniel, Fl. Kerala 1: 356. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 139. 2009. *Gordonia obtusifolia* Wight, Illustr. 1: 99. 1838. *Gordonia parvifolia* Wight, Illustr. 1: 99. 1838.

Trees, to 20 m high, bark greyish-white, 6 mm thick, smooth; branchlets tomentose. Leaves simple, alternate, 3.5-15 x 1.5-5 cm, elliptic, elliptic-oblong or elliptic-oblongate, acute or attenuate, apex acute, acuminate or obtuse, base cuneate, margin crenate or serrate, glabrous, coriaceous; lateral nerves 8-16 pairs, pinnate, prominent, intercostae reticulate, prominent; petiole 2-10 mm, slender, glabrous. Flowers bisexual, white, solitary, terminal or upper axillary; pedicels 2-5 mm long, pubescent. Sepals 5, free, unequal, 3-8 x 6-10 mm, orbicular, pubescent outside, glabrous inside. Petals 5, 1.5-2 x 0.8-1 cm, obovate, pubescent outside, glabrous inside, notched at the tip, extreme base united. Stamens numerous, 4-8 mm long, unequal, adnate to the base of the petals; anthers basifixed; ovary superior, ovoid, tomentose 5-celled, ovule 4-8 in each cell; style 1, stout, ribbed; stigma 6-lobed. Fruit a capsule, 2.5-3 x 1-1.25 cm, oblong with short acumen, 5-angled, valves deeply sulcate above; seeds ellipsoid, winged, wings 6-10 mm long, brownish.

Ambalappara, KVB 31741

Fl. & Fr.: October-May

Distribution: Fairly common in Evergreen forests of Ambalappara and Katikari. Endemic to Western Ghats

Note: Trees in Evergreen forests of Ambalappara are very dwarf, below 5 m high.

DIPTEROCARPACEAE

- 1a. Stamens 15 or less..... Hopea
- 1b. Stamens numerous..... 2
- 2a. Sepals equal, not enlarged in to wings in fruits..... Vateria
- 2b. Sepals unequal, outer 2 enlarged in to wings in fruit..... Dipterocarpus

DIPTEROCARPUS Gaertner, De Fructibus 3: 50. 1805.

- 1a. Calyx tube ribbed; young shoots yellowish-brown tomentose D. bourdillonii
- 1b. Calyx tube smooth; young shoots glabrous D. indicus

Dipterocarpus bourdillonii Brandis in Hook., Ic. Pl. t. 25. 1895; Gamble, Fl. Pres. Madras 81(58). 1915; K.P. Janardh. in B.D. Sharma & Sanjappa, Fl.

India 3: 210. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, Fl. Kerala 1: 360. 2005.

Evergreen trees, to 40 m high, bark grey; young parts covered with dense brown tomentum. Leaves simple, alternate, 20-45 x 12-25 cm, obovate, ovate or ovate-oblong, base obtuse, apex acute or acuminate, round or subcordate, margin entire or wavy, coriaceous, glabrous above and stellate hairy beneath; lateral nerves 12-15 pairs, parallel, prominent, intercostae scalariform, faint; petiole 38-55 mm long, swollen tipped, tomentose, stout; stipules large, lateral, amplexicaul, leaving an annular scar. Flowers bisexual, white, 4-5 x 3.7 cm, 3-5 in short axillary racemes. Calyx tubular, obconical; lobes 5, linear. Petals 5, 3.5-5 cm long, pubescent, valvate. Stamens 30; filaments of variable length, broad, compressed, connate at base, tapering gradually and filiform below the anther; anthers hastate, locules subequal; connective nearly as long as the anthers, produced above. Ovary superior, 3-celled, ovules 2 in each cell; style filiform, pubescent. Fruit a nut, 2.5 cm across, globose, enclosed at the base of thickened, accrescent calyx lobes, subacute, very tuberculate below; calyx tube 5-angular, wings 5, purplish-brown.

Chavachi, *KJD 26360*

Fl. & Fr.: January-June

Distribution: Fairly common in Evergreen forests of Chavachi.

Endemic to Western Ghats; Conservation status: Critically Endangered

Dipterocarpus indicus Bedd., Fl. Sylv. t. 94. 1871; Gamble, Fl. Pres. Madras 81(58). 1915; K.P. Janardh. in B.D. Sharma & Sanjappa, Fl. India 3: 214. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, Fl. Kerala 1: 361. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 140. 2009. *Dipterocarpus turbinatus* sensu Dyer in Hook. f., Fl. Brit. India 1: 295. 1874 p.p. non Gaertn.f.

Evergreen trees, to 35 m high, bole straight; bark pale grey, smooth; branchlets tomentose. Leaves simple, alternate, 7-25 x 4-17.5 cm, ovate, apex acute or acuminate, base acute, obtuse or cordate, margin crenate, undulate, glabrous, coriaceous; lateral nerves 10-15 pairs, parallel, prominent, intercostae scalariform, obscure; petiole 17-50 mm, slender, glabrous, swollen tipped; stipules large, lateral, leaving an annular stipular scar, tomentose. Flowers bisexual, white, fragrant, 3-5 together in axillary racemes; pedicels 3 cm long. Calyx cupular at base, lobes 5, unequal. Petals 5, tinged with pink. Stamens 30; filaments yellowish, often dilated at base; connective aristate. Ovary superior, slightly adherent to the calyx tube, 3-celled, ovules 2 in each cell. Fruit a nut; wings 2, oblong, reddish-brown, to 10 x 2 cm.

Crossway, *KVB 31530*

Fl. & Fr.: February-July

Distribution: Common in Evergreen forests of Chavachi and Crossway.

Endemic to Western Ghats; Conservation status: Vulnerable

HOPEA Roxburgh, Pl. Corom. 3: 7. 1811, *nom. cons.*

- 1a. Sepals subequal; fruit sepals shorter than the 'nut'..... *H. erosa*
- 1b. Sepals unequal, 2 outer ones enlarges in to long wings in fruit..... 2
- 2a. Panicle glabrous; petiole tomentose *H. ponga*
- 2b. Panicle tomentose; petiole glabrous *H. parviflora*

Hopea erosa (Bedd.) van Sloot., *Reinwardtia* 3: 318. 1956; K.P. Janardh. in B.D. Sharma & Sanjappa, *Fl. India* 3: 222. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, *Fl. Kerala* 1: 363. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 141. 2009. *Balanocarpus erosa* Bedd., *For. Man. Bot.* 237. 1873; Gamble, *Fl. Pres. Madras* 84(60). 1915.

Evergreen trees, to 25 m; bark 6-7 mm thick, pale brown, smooth. Leaves simple, alternate, 10-20 x 3-7 cm, oblong or oblong-lanceolate, apex acute or acuminate, base unequally cordate, margin entire, glabrous, coriaceous; lateral nerves 10-17 pairs, pinnate, arched, prominent, intercostae reticulate, prominent; petiole 17-50 mm, slender, glabrous, swollen tipped; stipule minute, lateral, deciduous. Flowers greyish-yellow, 1 cm across, subsessile, in unilateral, axillary racemed panicles. Calyx tube short, adnate to the torus; sepals 5, suborbicular, subequal, margin ciliate, reddish, imbricate. Petals 5, bilobed, pilose outside, glabrous inside, pinkish-white. Stamens 15, rarely 10; filaments dilated at the base; anthers short, ovate, exceeded by the apical awn. Ovary superior, glabrous, 3-celled, ovules 2 in each cell; style short; stigma thick. Fruit a nut, ovoid or oblong, apiculate, enclosed at the base by the thickened and accrescent sepals which often attain 2.5 cm long and spread horizontally.

Chavachi, *KJD 26047*

Fl. & Fr.: October-March

Distribution: Rare in Evergreen forests of Chavachi. Endemic to southern Western Ghats; Conservation status: Critically Endangered.

Hopea parviflora Bedd., *Fl. Sylv. t.* 7. 1869; Hook. f., *Fl. Brit. India* 1: 308. 1874; Gamble, *Fl. Pres. Madras* 82(59). 1915; Ansari, *Fl. Kasaragod Div.* 72. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 57. 1988; K.P. Janardh. in B.D. Sharma & Sanjappa, *Fl. India* 3: 228. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, *Fl. Kerala* 1: 365. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 141. 2009.

Evergreen trees, to 35 m high, bole straight, buttressed, bark 6-10 mm, light brown or grey, mottled with white, rough vertically fissured, fibrous; branchlets reddish-brown, slightly pubescent. Leaves simple, alternate, 8-11.5 x 3-5 cm, ovate, lanceolate or ovate-lanceolate, apex acute or glabrous, apiculate, base acute obtuse, cordate or subcordate, coriaceous; lateral nerves 8-12 pairs, pinnate, prominent, intercostae scalariform, faint, domatia present; petiole 10-12 mm, slender, pubescent when young, glabrous when matured, grooved above; stipules small, lateral, deciduous. Flowers bisexual, 3-4 mm across, creamy yellow, in unilateral terminal and upper axillary, tomentose racemose panicles. Sepals 5, 3 mm long, tomentose outside. Petals 5, 6 mm long, oblong, glabrous, fimbriate at apex. Stamens 5, rarely 10, slightly connate; connective of anthers produced into a subulate point. Ovary superior, glabrous, ovules 2 in each cell; style short, subulate. Fruit a nut, 5-6 mm long, terete, glabrous; wings 2, 6 x 1.8 cm, 8-10 nerved, glabrous.

Kariyankappu, *KJD 26090*

Fl. & Fr.: January-June

Distribution: Common in Semi-evergreen forests of Valayamchal, Narikkadavu and Pookundu, Evergreen forests of Meenmutty and Urupukunnu and plantations of Kariyankappu. Endemic to southern Western Ghats; Conservation status: Vulnerable

Hopea ponga (Dennst.) Mabb., Taxon 28: 587. 1979; Manilal & Sivar., Fl. Calicut 42. 1982; Ansari, Fl. Kasaragod Div. 72. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 58. 1988; K.P. Janardh. in B.D. Sharma & Sanjappa, Fl. India 3: 230. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, Fl. Kerala 1: 366. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 141. 2009. *Artocarpus ponga* Dennst., Schluss. Hort. Malab. 15,18,30. 1818. *Hopea wightiana* Wall.ex Wight & Arn., Prodr. 85.1834; Hook. f., Fl. Brit. India 1:309.1874; Gamble, Fl. Pres. Madras 82(59). 1915.

Evergreen trees, to 20 m high, bole fluted, bark dark grey, smooth, exfoliations large, rectangular or irregular; branchlets pubescent. Leaves simple, alternate, 7.5-24 x 3-7 cm, ovate-lanceolate or ovate-oblong or ovate, base rounded, or obtuse, apex acute, glabrous, coriaceous; lateral nerves 5-10 pairs, pinnate, prominent, intercostae scalariform, faint; petioles 5-15 mm long, stout, glabrous, grooved above; stipules small, lateral, deciduous. Flowers bisexual, yellowish-pink, in axillary unilateral drooping racemose panicles. Sepals 5, shortly united at base, ovate, glabrous, two outer sepals obtuse, larger than the 3 acute inner ones. Petals 5, 5-8 mm long, ovate-lanceolate, pubescent. Stamens 10 or 15, alternate filaments with two anthers; appendages of anthers filiform, 4 times longer than anthers. Ovary superior, puberulous above, 3-celled, ovules 2 in each cell; stylopodium glabrous; style short, subulate. Fruit a nut, ovoid, 10-12 mm long; calyx lobes expanded to forms wings, dark red; 2 longer wings 5.5-10 x 1-1.5 cm, 8-nerved, 3 smaller ones unequal.

Narikadv, NS & KVB 31445

Fl. & Fr.: Mar-June

Distribution: Common in Semi-evergreen forests of Valayamchal, Narikkadavu, Pookundu near waterbodies. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Note: One of the *Hopea* collections may be *H. glabra*. It has not flowered during the study period. Vegetative features and nature of galls are similar to *H. glabra*. In the absence of reproductive characters, the identity is not confirmed.

VATERIA L., Sp. Pl. 515. 1753.

Vateria indica L., Sp. Pl. 513. 1753; Hook. f., Fl. Brit. India 1: 313. 1874; Gamble, Fl. Pres. Madras 85(61). 1915; Manilal & Sivar., Fl. Calicut 42. 1982; Ansari, Fl. Kasaragod Div. 73. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 58. 1988; K.P. Janardh. in B.D. Sharma & Sanjappa, Fl. India 3: 245. 1993; K.P. Janardh. & W. Arisdason in P. Daniel, Fl. Kerala 1: 370. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 142. 2009. *Vateria malabarica* Blume, Mus. Bot. Lugd.-Bat. 2: 29. 1852.

Evergreen trees, to 30 m high, bark 10-12 mm, greyish, blotched with white and green, smooth; exudation, sticky, resinous; branchlets puberulous. Leaves simple, alternate, 7-20 x 5-9 cm, oblong, apex acuminate or obtusely acute, base round, obtuse or cordate, margin entire, glabrous, coriaceous; lateral nerves 12-18 pairs, parallel, prominent, intercostae scalariform, prominent; petiole 25-40 mm, stout, stellate pubescent, swollen tipped; stipule narrow, lateral, deciduous. Flowers bisexual, white, 2-3 cm across, fragrant, in terminal panicles, densely stellate puberulous. Sepals 5, free,

lanceolate, covered with stellate hairs. Petals 5, white, obovate, spreading, shortly united at base. Stamens many, free; filaments hairy; anthers often slightly hairy at base; connective produced into a filiform appendage. Ovary superior, ovoid-oblong, tomentose, 3-celled, 2-ovules in each cell; style filiform, glabrous; stigma small. Fruit a capsule, 11-15 x 5-6 cm, pale brown, ovoid or oblong-ovoid, lanceolate, tip acuminate; seed one.

Kariyankapp, *KJD 26091*

Fl. & Fr.: February-August

Distribution: Common in Evergreen forests of Chavachi near water bodies. Endemic to Western Ghats.

ANCISTROCLADACEAE

ANCISTROCLADUS Wall., Num. List 1052. 1929, *nom. cons.*

Ancistrocladus heyneanus Wall. ex Graham, Cat. Pl. Bombay 28. 1839; Hook. f., Fl. Brit. India 1: 299. 1874; Gamble, Fl. Pres. Madras 86(62). 1915; Silpi Das in B.D. Sharma & Sanjappa, Fl. India 3: 254. 1993; R. Chandra. in P. Daniel, Fl. Kerala 1: 374. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 143. 2009.

Climbing shrubs, branches hooked, branchlets glabrous. Leaves simple, crowded at the apex of branchlets, sessile, 16-20 x 4-6 cm, oblanceolate, apex acute, base attenuate, margin entire. Flowers to 1 cm across, in terminal lax panicles, bisexual, sessile. Sepals 5, unequal, connate into a tube, adnate to the ovary, lobes 3 mm long. Petals 5, subequal, ca 6 mm long, oblong, obtuse, slightly connate at base, greenish yellow. Stamens 10, filaments connate at base, anthers orbicular. Ovary 1-celled; ovules solitary; style 3, free. Fruit a nut covered by large wing like sepals; wings unequal, to 5 x 2 cm, obovate, obtuse, reticulate, glabrous.

Kattikari State Boundary, *KJD 26006*

Fl. & Fr.: February-April

Distribution: Fairly common in plantations of Kariyankappu and Evergreen forests of Moonamthode and Kattikari.

MALVACEAE

- 1a. Cells of ovary 1-ovuled 2
- 1b. Cells of ovary 2-or ovuled 3
- 2a. Fruit covered with prickles, epicalyx present Urena
- 2b. Fruit with out prickles, epicalyx absent Sida
- 3a. Style 1, unbranched Thespesia
- 3b. Styles 5 or more branched 4
- 4a. Flowers without epicalyx Abutilon
- 4b. Flowers with epicalyx 5
- 5a. Calyx spathaceous Abelmoschus
- 5b. Calyx bot spathaceous, lobes equal Hibiscus

ABELMOSCHUS Medikus, Malv. 45. 1787.

Abelmoschus manihot (L.) Medik., Malv. 46. 1787; Ansari, Fl. Kasaragod Div. 73. 1985; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 74. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:304.1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 67. 1996; M. Mohanan & A.V.N. Rao in P. Daniel,

Fl. Kerala 1: 402. 2005. *Hibiscus manihot* L., Sp. Pl. 696. 1753; Hook. f., Fl. Brit. India 1: 341. 1874; Gamble, Fl. Pres. Madras 97(69). 1915. *Abelmoschus manihot* (L.) Medik. ssp. *tetraphyllus* (Hornem.) Borss., Blumea 14:97. 1996; Ramach. & V.J. Nair, Fl. Cannanore Dist. 59. 1988; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 75. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:306.1993; Anil Kumar et al., Fl. Pathanamthitta 78. 2005. *Abelmoschus manihot* ssp. *tetraphyllus* var. *pungens* (Roxb.) Hochr., Candollea 1: 87. 1924; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 77. 1988.

Shrubs, to 2 m tall; whole plant hirtus with stiff hairs. Leaves simple, alternate, 15 x 12 cm, 3-5 lobed, lobes acute, crenate-serrate; petiole to 15 cm long; stipule 1 cm long, lanceolate. Flowers in terminal raceme; pedicel 7 cm long; involucral bracts 30 x 17 mm, ovate, acute, densely hairy. Calyx membranous, glabrous. Petals white, changing to pink, to 6 x 4 cm, obovate, glabrous. Capsule 5-6 x 2 cm, oblong, acute, densely yellow hispid; seeds many, reniform, hispid along concentric lines.

Valyamchal, *KJD 18721*

Fl. & Fr.: July-December

Distribution: Rarely seen along the boundaries near Farm as weed.

ABUTILON P. Miller, Gard. Dict. ed. 4. 23. 1754.

Abutilon persicum (Burm.f.) Merr., Philipp. J. Sci. 19: 364. 1921; Borss., Blumea 14: 163. 1966; Ansari, Fl. Kasaragod Div. 74. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 60. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 269. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 201. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 381. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 147. 2009. *Sida persica* Burm.f., Fl. Ind. 148. 1768. *Sida polyandra* Roxb., Fl. Ind. 3: 173. 1832. *Abutilon polyandrum* (Roxb.) Wight & Arn. ex Wight, Cat. 12. 1833, non G. Don 1831; Hook. f., Fl. Brit. India 1: 325. 1874; Gamble, Fl. Pres. Madras 91(65). 1915.

Pubescent herbs or subshrubs. Lower leaves ovate-cordate, to 15 cm long; upper ovate to lanceolate, crenate-dentate, velutinous below and glabrescent above, basally 5-9 nerved. Flowers 3.5-4.5 cm across. Petals yellow, obovate. Mericarps 5, puberulous.

Valayamchal, *KJD 18716*

Fl. & Fr.: November-April

Distribution: Seen along the boundary of the Sanctuary.

HIBISCUS L., Sp. Pl. 693. 1753, *nom. cons.*

- 1a. Prickly, climbing or scandent shrubs 2
- 1b. Shrubs without prickles *H. lunariifolius*
- 2a. Stipules foliaceous, lunulate, auriculate at base *H. surattensis*
- 2b. Stipules not foliaceous, ovate-lanceolate *H. hispidissimus*

Hibiscus hispidissimus Griff., Not. Pl. Asiat. 4: 521. 1854; Sivar. & Pradeep, Malvac. Southern Peninsular India 106. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 413. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 149. 2009. *Hibiscus aculeatus* Roxb., Fl. Ind. 3: 206. 1832; Ansari, Fl. Kasaragod Div. 75. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 60. 1988; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 123. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:323.1993, non Walter 1788. *Hibiscus furcatus* Roxb.

ex DC., Prodr. 1: 448. 1824; Hook. f., Fl. Brit. India 1: 335. 1874; Gamble, Fl. Pres. Madras 97(70). 1915; Manilal & Sivar., Fl. Calicut 47, non Willd. 1809.

Rambling or climbing shrubs; stems, petioles and pedicels armed with recurved prickles, often intermingled with dense stellate indumentum. Leaves entire to 3-5-angled or lobed, alternate, 4-8 x 3-7 cm, cordate or truncate at the base, margins coarsely serrate, apex acuminate, prickly on the nerves beneath; petiole 4-7 cm long, prickly; stipules c. 7 x 3 mm, lanceolate, ciliate. Flowers axillary, solitary; pedicels 1.5-5 cm long, jointed above middle, prickly. Involucral bracts 10-12, c. 15 x 3 mm, bifurcate, apex spatulate. Calyx tube c. 1 cm long, nerves densely pubescent with long stellate and simple hairs; lobes 5, c. 10 x 4 mm, lanceolate. Corolla c. 8 cm across, yellow with deep purple center; petals 5, 4-5 x 3-4 cm, obovate. Staminal column up to 1.5 cm long, antheriferous throughout; filaments c. 3 mm long, purplish; anthers purplish. Ovary c. 5 mm long, ovoid, 5-celled, densely appressed hairy; stigma 5, capitate. Capsule c. 1.5 cm long, ovoid or conical, bristly hairy. Seeds c. 4 mm long, 3-gonous, dark brown, concentrically tubercled.

Kariyenkappu, *KJD 26373*

Fl. & Fr.: September-March

Distribution: Teak plantations of Kariyenkappu.

Hibiscus lunariifolius Willd., Sp. Pl. 3: 811. 1800; Hook. f., Fl. Brit. India 1: 338. 1874; Gamble, Fl. Pres. Madras 98 (70). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 61. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 334. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 138. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 415. 2005. *Hibiscus pruriens* Roxb. ex Hornem., Hort. Hafn. 1: 79. 1815.

Shrubs, densely covered with soft spreading hairs. Leaves shallowly 3-5-lobed, alternate, 7-16 x 6-18 cm, lobes acute to acuminate, cordate at base, serrate, stellate-hairy; petiole to 25 cm long. Flowers axillary or terminal, racemose; bracts 25 x 3 mm, linear-lanceolate. Calyx 15 mm long, campanulate, lobes acuminate. Corolla 7-10 cm across, yellow with brown eye. Capsule 2 x 1.5 cm, ovoid, obtuse, cuspidate, stellate-hairy; seeds 2.5 x 2 mm, rugose.

Kariyenkappu, *KJD 18798*

Fl. & Fr.: October-February

Distribution: Teak plantations.

Hibiscus surattensis L., Sp. Pl. 696. 1753; Hook. f., Fl. Brit. India 1: 334. 1874; Gamble, Fl. Pres. Madras 97(70). 1915; Manilal & Sivar., Fl. Calicut 47. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 61. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 327. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 119. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 422. 2005; Sunil & Sivadasan, Fl. Alappuzha Dist. 121. 2009.

Scandent or trailing undershrubs; stems, petioles and pedicels armed with recurved prickles. Leaves 3-5-palmilobed, 5-10 x 5-12 cm, ovate-suborbicular, lobes lanceolate, apex acute, shallowly cordate to subtruncate at base, margins coarsely serrate to dentate; basally 5-7-nerved, prickly below on the nerves; petiole 4-10 cm long; stipules 8-12 x 3-5 mm, foliaceous, auricled at base, margins ciliate. Flowers axillary, solitary; pedicels 4-7 cm long, jointed at the base of flower, prickly. involucral bracts 10-12, 18-22 x 2-3 mm, spatulate, bifurcate, spreading; appendage erect, up to 1 cm long, linear,

pubescent. Calyx tube to 6 mm long; lobes 5, 1-1.5 cm long, ovate, long-acuminate, prickly. Corolla c. 5 cm across, creamy-yellow with dark purplish center; petals 2.5-5 x 2-4 cm, obovate, apex rounded. Staminal column 1.5-2 cm long, glandular hairy, antheriferous throughout; filaments 1-2 mm long. Ovary 3-4 mm long, subconical, densely appressed hairy; stigma capitate, purplish. Capsules c. 2 cm long, ovoid or conical enclosed within accrescent calyx, densely covered with closely appressed hairs; seeds c. 3 mm long, angular, brownish-black.

Kariyenkappu, *KJD 26396*

Fl. & Fr.: October-January

Distribution: Teak plantations.

SIDA L., Sp. Pl. 683. 1753.

- 1a. Mericarps 5 2
- 1b. Mericarps 6-10 4
- 2a. Erect herbs or shrubs *S. mysorensis*
- 2b. Prostrate or trailing herbs 3
- 3a. Stem rooting at nodes; calyx lobes longer than the tube *S. beddomei*
- 3b. Stem not rooting at nodes; calyx lobes equal to the tube *S. cordata*
- 4a. Leaves velvety tomentose below; awns as long as the mericarps *S. cordifolia*
- 4b. Leaves not velvety tomentose; awns shorter than the mericarps 5
- 5a. Leaves linear oblong, stipules dissimilar, one subulate and other linear-lanceolate *S. acuta*
- 5b. Leaves usually obovate, stipules similar *S. alnifolia*

Sida acuta Burm. f., Fl. Ind. 147. 1768, ssp. *acuta*: Borss., Blumea 14:186.1966; Gamble, Fl. Pres. Madras 90(64). 1915; Manilal & Sivar., Fl. Calicut 45. 1982; Ansari, Fl. Kasaragod Div. 76. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 63. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:281.1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 238. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 387. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 153. 2009. *Sida lanceolata* Retz., Obs. Bot. 4: 119. 1786. *Sida carpinifolia* sensu Mast. in Hook.f., Fl. Brit. India 1: 323. 1874 p.p. non L.f. 1781.

Erect subshrubs to 70 cm tall; branches distichous. Leaves simple, alternate, 3-6 x 1-2 cm, lanceolate to ovate, apex acute or acuminate, base truncate, margins serrate, entire towards base, sparsely hirsute to glabrate on both surfaces; 3-nerved at base; petiole to 4 mm long; stipules 5-8 x 1-1.5 mm, unequal, one lanceolate, the other linear. Flowers solitary, axillary; pedicels to 5 mm long. Calyx 6-8 mm long, campanulate, ciliate on margins, divided to the middle. Petals creamy-yellow, 6-8 mm long, obliquely obovate. Staminal column c. 2 mm long; filaments to 1.5 mm long; anthers pale yellow. Ovary c. 1.5 mm long, ovoid; styles 6-8; stigma globose, yellow. Schizocarp to 5 mm long; mericarps 6-8, c. 3 x 2 mm, trigonous, reticulate, apically 2-awned; seeds c. 2 mm long, trigonous.

Kariyankappu, *NS &KJD 25550; KJD 31859*

Fl. & Fr.: August-November

Distribution: Common in Teak plantations.

Sida alnifolia L., Sp. Pl. 684. 1753; Sivar. & Pradeep, Malvac. Southern Peninsular India 241. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 388. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 153. 2009. *Sida retusa* L., Sp. Pl. (ed. 2) 961. 1763. *Sida rhombifolia* L. var. *retusa* (L.) Mast. in Hook. f., Fl. Brit. India 1: 324. 1874. *Sida rhombifolia* L. ssp. *retusa* (L.) Borss., Blumea 14: 198. 1966; Ramach. & V.J. Nair, Fl. Cannanore Dist. 64. 1988; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 216. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:289.1993; Anil Anil Kumar et al., Fl. Pathanamthitta 90. 2005. *Sida rhombifolia* L. ssp. *alnifolia* (L.) Ugborogho, Bol. Soc. Brot. ser. 54:70. 1980.

Subshrubs to 40 cm tall, strongly branched. Leaves simple, alternate, 1-3 x 0.8-2.5 cm, obovate to elliptic-lanceolate, apex retuse, emarginate, rounded or subacute, base obtuse or rounded, margins irregularly serrate-dentate or crenate to the distal half, entire towards the proximal half, upper surface sparsely pubescent, lower surface densely greyish tomentose; petiole to 4 mm long, stellate-pubescent; stipules c. 3 mm long, linear. Flowers axillary, solitary; pedicels 3-4 mm long in flowers, to 2.5 cm in fruits, jointed at about the middle. Calyx 5-6 mm long, c. 6 mm across, pubescent without, 5-lobed; lobes c. 2 mm long, ovate to triangular. Petals yellow, 6-7 x 5-6 mm, obliquely obovate. Staminal column to 3 mm long, antheriferous at apex. Ovary c. 1.5 mm across, depressed globose; styles 7-10; stigma capitate, creamy-yellow. Schizocarp to 4 mm long; mericarps 7-10, included in the calyx, with a pair of short obtuse mucro at apex; seeds c. 2 mm long, black.

Kariyenkappu, *KJD 18725*

Fl. & Fr.: September-December

Distribution: Along road sides and plantations.

Sida beddomei Jacob, J. Bombay Nat. Hist. Soc. 47: 50. 1950; Ramach. & V.J. Nair, Fl. Cannanore Dist. 63. 1988; Sivar. & Pradeep, Malvac. Southern Peninsular India 266. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 154. 2009. *Sida cordata* sensu T.K. Paul & M.P. Nayar, Fl. Ind. Fasc. 19: 206. 1988 & Fl. Ind. 3: 285. 1993, non (Burm.f.) Borss., 1966.

Slender prostrate herbs, rooting at lower nodes. Leaves simple, alternate, 5 x 4 cm ovate, acute or acuminate, base cordate, crenate-serrate, sparsely tomentose, basally 5-7 nerved. Flowers axillary, solitary, 1.5 cm across, yellow; pedicel to 4 cm long. Calyx lobes longer than the tube; lobes 5. Petals 5, yellow. Mericarps awnless.

Valayamchal, *KJD 22577*

Fl. & Fr.: January-March

Distribution: Rare in Semi-evergreen forests of Valayamchal to Narikkadavu. Endemic to southern Western Ghats

Sida cordata (Burm. f.) Borss., Blumea 14: 182. 1966; Manilal & Sivar., Fl. Calicut 43. 1982; Sivar. & Pradeep, Malvac. Southern Peninsular India 266. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 389. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 154. 2009. *Melochia cordata* Burm. f., Fl. Ind. 143. 1768. *Sida veronicaefolia* Lam., Encycl. 1: 5. 1783; Gamble, Fl. Pres. Madras 89(64). 1915. *Sida humilis* Cav. var. *veronicaefolia* (Lam.) Mast. in Hook. f., Fl. Brit. India 1: 322. 1874.

Prostrate herbs; branches slender, trailing; stem, petioles and pedicels pubescent with minute stellate hairs intermingled with simple hairs. Leaves

simple, alternate, 2-5.5 x 1.5-4.5 cm, broadly ovate or orbicular, apex acute to acuminate, base cordate, margins serrate-crenate; basally 5-7-nerved, stellate-tomentose on both sides; petioles to 3 cm long; stipules 1-2 mm long, linear. Flowers axillary, solitary; pedicels to 2 cm long, filiform, articulated above the middle. Calyx c. 5 mm long, campanulate, divided to the middle, stellate-tomentose without; lobes 5, triangular. Petals to 6 x 5 mm, obovate, apex rounded or slightly emarginate. Staminal column c. 2 mm long; anthers numerous, yellow. Ovary c. 2 mm across, subglobose; styles 5; stigmas 5, globose, yellowish. Schizocarp to 2.5 mm long; mericarps 5, to 3 x 2 mm, trigonous with rounded angles, apex shortly 2-beaked, completely enclosed in accrescent calyx; seeds c. 2 mm long, reniform, brownish-black.

Valayamchal, *KJD 26353*

Fl. & Fr.: January-April

Distribution: Along road sides and plantations.

Sida cordifolia L., Sp. Pl. 684. 1753; Hook. f., Fl. Brit. India 1: 324. 1874; Gamble, Fl. Pres. Madras 89(64). 1915; Manilal & Sivar., Fl. Calicut 43. 1982; Ansari, Fl. Kasaragod Div. 76. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 63. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 285. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 256. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 390. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 154. 2009.

Erect, branched subshrubs to 1.5 m tall; stem green, densely tomentose with minute stellate and spreading simple hairs. Leaves simple, alternate, 1.5-5.5 x 1-3.5 cm, ovate, rarely suborbicular, apex subobtusate or acute, base cordate, margins serrate to the base; basally 3-5 nerved, densely stellate-tomentose beneath with simple hairs on nerves and soft tomentose above; petiole to 3.5 cm long, pubescent; solitary or aggregated terminally in to congested corymbiform inflorescence; pedicel to 3 mm long in flower, to 1.2 cm in fruits, articulated above the middle. Calyx 6-7 mm long, prominently 10-ribbed, densely tomentose without. Petals to 8 x 6 mm, yellow, obliquely obovate, apex truncate or slightly emarginate. Staminal column c. 3 mm long. Ovary subglobose, pubescent; styles 8-10; stigma capitate, yellow. Schizocarp 6-7 mm diam., pubescent towards apex; mericarps 8-10, to 3 x 2 mm, trigonous with acute angles, apically 2-awned; seeds brownish or black.

Paripode, *KJD 22516*

Fl. & Fr.: Throughout the Year

Distribution: Along road sides and plantations.

Sida mysorensis Wight & Arn., Prodr. 59. 1834; Hook. f., Fl. Brit. India 1: 322. 1874; Ansari, Fl. Kasaragod Div. 77. 1985; T.K. Paul & M.P. Nayar, Fasc. Fl. Ind. 19: 209. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3:286.1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 271. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 392. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 155. 2009. *Sida hirta* Wall., Cat. n. 1855, 1828, non Lam. 1783. *Sida glutinosa* Roxb., Fl. Ind. 3: 172. 1832, non Cav. 1785; Gamble, Fl. Pres. Madras 89(64). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 64. 1988; Mohanan & Sivad., Fl. Agasthyamala 100. 2002. *Sida urticifolia* Wight & Arn., Prodr. 59. 1834, non St. Hill. 1828.

Erect subshrubs, stem viscid, green, densely invested with stellate, gland-tipped and simple patent hairs. Leaves simple, alternate, 3-5 x 2-3.5 cm,

broadly ovate, apex acute to acuminate, base cordate, margins serrate-crenate; 5-7-nerved at base, pubescent with stellate and simple hairs intermingled with gland-hairs on both surfaces; petioles to 3 cm long; stipules c. 5 mm long, linear, pubescent. Flowers axillary, solitary or often in 5-7-flowered, lax racemes; pedicels to 5 mm long, filiform, jointed above middle. Calyx to 7 mm long, campanulate, divided to the middle; lobes 5, triangular, densely covered with both stellate and simple hairs externally. Corolla c. 8 mm across, orangish-yellow; petals c. 5 x 3 mm, obovate, emarginate or retuse at apex. Staminal column to 3 mm long; anthers 10-14, yellow. Ovary c. 2 mm across, subglobose; styles and stigmas 5, yellow. Schizocarp c. 3 mm long; mericarps 5, to 3 x 2 mm, trigonous; seeds c. 2 mm long, reniform, brownish-black.

Pottichapara, *KJD 22514*

Fl. & Fr.: October-January

Distribution: Along road sides and plantations.

THESPESIA Solander ex Correa, Ann. Mus. Natl. Hist. Nat. 9: 290. 1807, *nom. cons.*

Thespesia lampas (Cav.) Dalz. & Gibs., Bombay Fl. 19. 1861; Hook. f., Fl. Brit. India 1: 345. 1874; Ansari, Fl. Kasaragod Div. 77. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 64. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 350. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 40. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 430. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 157. 2009. *Hibiscus lampas* Cav., Diss. 3: 154. t.56. 1787; Gamble, Fl. Pres. Madras 98(71). 1915.

Shrubs, to 1.5 m tall; stems glabrous. Leaves to 15 x 14 cm; 3-5-lobed or entire, ovate, cordate or truncate at base, lobes acute, densely stellate pubescent beneath; petioles 3-8 cm long. Flowers axillary, solitary or in terminal racemes; pedicels 2-6 cm long jointed above the middle; involucellar bracts 4-7, subulate, deciduous. Calyx cupular, 12 mm across, stellate hairy. Corolla 6-8 cm across, rose-yellow. Capsule 25 x 20 mm, ellipsoid, glabrous, 5-valved; seeds many, 5 x 3 mm, trigonous, glabrous, brown.

Meenmutty, *KJD 22537*

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Meenmutty.

URENA L., Sp. Pl. 692. 1753.

3a. Leaves undivided; epicalyx cup shaped in fruit...*Urena lobata* ssp. *lobata*

3b. Leaves deeply lobed; epicalyx lobes reflexed in fruit...*Urena lobata* ssp. *sinuata*

Urena lobata L., Sp. Pl. 692. 1753, **ssp. lobata**; Hook. f., Fl. Brit. India 1: 329. 1874; Gamble, Fl. Pres. Madras 92(66). 1915; Borss., Blumea 14: 140. 1966; Ramach. & V.J. Nair, Fl. Cannanore Dist. 65. 1988; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 380. 1993; Sivar. & Pradeep, Malvac. Southern Peninsular India 180. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, Fl. Kerala 1: 440. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 158. 2009.

Erect branched subshrubs to 2m tall; stems densely stellate-pubescent. Leaves simple to 3-5 shallowly lobed, alternate, 3-10 x 3-9 cm, broadly to narrowly ovate, upper most leaves sometimes lanceolate, 3-5 angular to shallowly lobulate, truncate or cordate at base, margin obscurely crenate-serrate; 5-7-nerved from base, sparsely stellate-pubescent above, densely

stellate-pubescent below, with 1-3 elliptic nectaries on principal nerves, lobes generally acute or acuminate, varying in size; petioles 3-8 cm long, stellate-pubescent; stipules up to 4 mm long, linear to subulate. Flowers axillary, usually solitary, sometimes 2 or 3 in a cluster; pedicels 3-8 mm long. Involucral bracts 5, 5-6 x 1.5-2 mm, spathulate, connate at base, clothed with rigid hairs. Calyx 5-9 mm long, campanulate, 5-parted; lobes ovate-elliptic, margins pubescent. Corolla pink with dark center; petals to 15 x 9 mm, obovate with rounded apex, stellate-hairy without. Staminal column 8-10 mm long, pinkish; anthers pale pink. Ovary to 4 mm across, subglobose, stiff-hirsute; Stigmas capitate. Schizocarp 10-12 mm across, globose; mericarps 5, to 8 x 5 mm, trigonous, densely stellate-pubescent, also with many glochidate spines; seeds to 4 mm long, reniform, angular.

Pothurumi, *KJD 22544*

Fl. & Fr.: August-December

Distribution: Commonly in Plantations and open areas of Evergreen forests at Kariyenkappu, Chavachi and Pothurumi.

Urena lobata L. **ssp. sinuata** (L.) Borss., *Blumea* 14: 142. 1966; Hook. f., *Fl. Brit. India* 1: 329. 1874; Manilal & Sivar., *Fl. Calicut* 46. 1982; Ansari, *Fl. Kasaragod Div.* 78. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 65. 1988; T.K. Paul & M.P. Nayar, *Fasc. Fl. Ind.* 19: 230. 1988; Paul in B.D. Sharma & Sanjappa, *Fl. India* 3:382.1993; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 158. 2009. *Urena sinuata* L., *Sp. Pl.* 692. 1753; Hook. f., *Fl. Brit. India* 1: 329. 1874; Gamble, *Fl. Pres. Madras* 92(66). 1915; Sivar. & Pradeep, *Malvac. Southern Peninsular India* 184. 1996; M. Mohanan & A.V.N. Rao in P. Daniel, *Fl. Kerala* 1: 441. 2005; Sunil & Sivadasan, *Fl. Alappuzha Dist.* 133. 2009.

Erect annual herbs. Leaves plametyly deeply lobed, alternate, 6 x 7 cm, base truncate, velvety tomentose on both sides, to 7-ribbed at base. Flowers axillary, usually solitary, sometimes 2 or 3 in a cluster; pedicels 3-8 mm long. Involucral bracts 5, 5-6 x 1.5-2 mm, connate at base, clothed with rigid hairs. Calyx 5-9 mm long, campanulate, 5-parted; lobes ovate-elliptic, margins pubescent. Corolla pink with dark center; petals to 15 x 9 mm, obovate with rounded apex, stellate-hairy without. Staminal column, pinkish; anthers pale pink. Ovary to 4 mm across, subglobose, stiff-hirsute; Stigmas capitate. Schizocarp 10-12 mm across, globose; mericarps 5, to 8 x 5 mm, trigonous, densely stellate-pubescent, also with many glochidate spines; seeds to 4 mm long, reniform, angular.

Pothurumi, *KJD 22545*

Fl. & Fr.: August-December

Distribution: Common in Plantations of Kariyenkappu.

BOMBACACEAE

- 1a. Leaves digitate; fruits smooth Bombax
 1b. Leaves simple; fruits prickly Cullenia

BOMBAX L., *Sp. Pl.* 511.1753.

Bombax ceiba L., *Sp. Pl.* 511. 1753; Nicolson, *Taxon* 28: 370. 1979; Manilal & Sivar., *Fl. Calicut* 50. 1982; Ansari, *Fl. Kasaragod Div.* 79. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 66. 1988; M.P. Nayar & Biswas in B.D. Sharma & Sanjappa, *Fl. India* 3: 398. 1993; S.K. Srivastava & K. Vivek. in P. Daniel,

Fl. Kerala 1: 443. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 159. 2009 *Bombax malabaricum* DC., Prodr. 1: 479. 1824; Hook. f., Fl. Brit. India 1: 349. 1874; Gamble, Fl. Pres. Madras 99(71). 1915.

Salmalia malabarica (DC.) Schott & Endl., Melet. Bot. 35. 1832.

Deciduous trees; to 45 m high; bole straight, buttress 1-2 m high, armed with conical prickles; bark 20-30 mm thick, grey mottled with white, longitudinal fissures shallow; branches horizontal and more or less whorled; branchlets prickly. Leaves digitately-compound, alternate, stipulate; rachis 12-25 cm, stout, swollen at base, glabrous; leaflets 5-7, whorled; 10-20 x 2-6 cm, elliptic, elliptic-ovate or elliptic-obovate, apex caudate-acuminate, base attenuate or cuneate, margin entire, glabrous, chartaceous; lateral nerves 8-14 pairs, parallel, slightly ascending, prominent, secondary laterals also seen; intercostae reticulate; petiolule 14-25 mm long, stout, glabrous; stipules small, lateral;. Flowers bisexual, dark crimson, 6-7 cm across, solitary or 2-5 together; pedicels 1-2 cm long, thick. Calyx campanulate, irregularly lobed, lobes 3-4 x 3 cm, coriaceous, glabrous to sparsely puberulous outside, silky inside, falling off with corolla and stamens. Petals 5, 8.5-18 x 3.5-5 cm, obovate to elliptic-obovate, recurved, fleshy, tomentellous outside, imbricate. Stamens 65-80, 3-7.5 cm long in 5 bundles; staminal tube short; filaments flat, angular, connate only at the base of the bundles; anthers reniform. Ovary conical, tomentose, 5-celled; ovules many; style exceeding the stamens; stigma 5-fid, lobes spreading. Fruit a capsule, 8-10 x 3 cm, downy tomentose, cylindrical, cuneate on both ends, blackish and glabrous at maturity, the columella brownish; seeds numerous, pyriform, smooth, dark brown, embedded in white cotton.

Moonamthode, *KJD 18745*

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Moonamthode and Crossyway.

CULLENIA Miller *emend.* Gaertner

Cullenia exarillata Robyns, Bull. Jard. Bot. Nat. Belg. 40: 249. 1970; Ramach. & V.J. Nair, Fl. Cannanore Dist. 66. 1988; M.P. Nayar & Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 402. 1993; S.K. Srivastava & K. Vivek. in P. Daniel, Fl. Kerala 1: 448. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 161. 2009. *Cullenia excelsa* Wight, Ic. t. 1701, 1762.1851,p.p.; Hook. f., Fl. Brit. India 1:350.1874; Gamble, Fl. Pres. Madras 101(73).1915. *Cullenia rosayroana* Kosterm., Comm. For. Res. Inst. Indones. Bogor 51: 4, f.2e & 3. 1956 & in Reinwardtia 4: 72. 1956,p.p.

Evergreen trees, to 40 m high; bole straight, buttressed; bark 10-15 mm thick, grey mottled with white, smooth; outer bark 1-2 mm thick, dead; blaze pink; branches horizontal; older branches furnished with large tubercles; young branchlets and underside of leaves densely covered with peltate scales. Leaves simple, alternate, distichous, estipulate, 7.5-16 x 2.5-6 cm, elliptic, oblong, oblong-lanceolate or elliptic-lanceolate, apex acute or acuminate, base rounded or obtuse, margin entire, coriaceous, dark green and shiny above, covered with orange peltate scales beneath; lateral nerves many, parallel, slender, obscure, lepidote beneath, midrib raised beneath; secondary lateral present; intercostae reticulate, faint; petiole 13-25 mm, stout, lepidote, grooved above. Flowers bisexual, 3-3.5 cm long, brownish-yellow, densely

clustered on tubercles on old branches; pedicel 2-3 cm long; epicalyx tubular, 1-1.5 cm long, campanulate, 4-5 lobed at apex, densely lepidote outside, whitish puberulus inside. Calyx tube 3-3.5 cm long, 5 lobed at apex, densely lepidote outside. Corolla absent. Staminal tube 3-5 cm long, 5 lobed at apex with many stamens along the margin; anthers globose, circum sessile. Ovary pentangular, superior, syncarpous, densely lepidote, 5 locular; ovules 2 in each locule; style woody, with prominent scales at base; stigma capitate, densely papillose. Fruit a capsule, 12-20 cm across, almost globose with acute tip, spiny, 5 valved; seeds 2 in each locule, 4-4.5 x 2-2.5 cm dark brown, shining.

Pothurumi, *KJD 18788*

Fl. & Fr.: January-November

Distribution: Rare in Evergreen forests of Pothurumi.

Endemic to southern Western Ghats.

STERCULIACEAE

- 1a. Flowers bisexual; petals present 2
- 1b. Flowers unisexual; petals absent 4
- 2a. Stamens 5; herbs *Melochia*
- 2b. Stamens 10 or more; shrubs or trees 3
- 3a. Fruit of 5 spirally twisted follicles, seeds not winged *Helicteres*
- 3b. Fruit a 5-valved woody capsule, seeds winged *Pterospermum*
- 4a. Seeds not winged *Sterculia*
- 4b. Seeds or fruit winged 5
- 5a. Leaves shining below, covered with scales; fruit of winged
1-seeded follicles *Heritiera*
- 5b. Leaves not scaly or shining below; fruit of woody many seeded follicles . *Pterygota*

HELICTERES L., Sp. Pl. 963. 1753.

Helicteres isora L., Sp. Pl. 963. 1753; Hook. f., Fl. Brit. India 1: 365. 1874; Gamble, Fl. Pres. Madras 107(77). 1915; Manilal & Sivar., Fl. Calicut 51. 1982; Ansari, Fl. Kasaragod Div. 80. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 67. 1988; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3: 426. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 456. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 162. 2009.

Large shrubs or small trees; bark pale greyish, finely wrinkled; young shoots stellate-tomentose. Leaves simple, alternate, 5-12 x 3-8 cm, obovate to suborbicular, apex acute or acuminate, base cordate, margin irregularly crenate-serrate; 3-5-nerved at the base, scabrous above and stellately tomentose below; petioles to 1.2 cm long. Flowers axillary, solitary or in few-flowered cymes; bracts 2-3 mm long, linear, 2 brown glands present in the axil of bracts; pedicel to 6 mm long. Calyx slightly yellow, persistent, tubular, splitting in to 5 irregular lobes; tube 1.5-2 cm long, densely stellate hairy without. Petals 5, unequal, 2-2.5 cm long, obovate, clawed, crimson, fading to pale blue. Staminal column 3-3.5 cm long, cylindrical; stamens 10; staminodes 5. Ovary 2-2.5 mm long, placed at tip of gynophore, 5-lobed, 5-celled; ovules many; style 5; stigma subulate. Follicles 5, 4-6 cm long, spirally twisted, stellate-tomentose, beaked; seeds 2-3 mm long, angular, black, wrinkled.

Paripode, *KJD 26391*

Fl. & Fr.: September-March

Distribution: Semi-evergreen forests and plantations.

HERITIERA J.F.Gmel., Syst. Nat., ed. 13, 2(1): 113. 1791.

Heritiera papilio Bedd., Fl. Sylv. t. 218. 1872; Hook. f., Fl. Brit. India 1: 363. 1874; Gamble, Fl. Pres. Madras 104(74). 1915; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3: 430. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 458. 2005.

Evergreen trees, to 25 m high, bark greyish-brown with scurfy small warts; young parts clothed with golden brown soft tomentum. Leaves simple, alternate, 4-20 x 1.5-10 cm, ovate or ovate-lanceolate, apex acute, base obtuse or round, margin entire, glabrous above, densely silvery lepidote scaly beneath, coriaceous; 3-ribbed from base, lateral nerves 2-7 pairs, pinnate, prominent, intercostae reticulate, obscure, petiole 10-37 mm, stout, peltate scaly, swollen tipped; stipules free, lateral, deciduous. Flowers small, bi or unisexual in axillary panicle, cream coloured. Calyx campanulate, 5-toothed or 5-fid. Petals absent. Anthers adnate in a regular ring on an androgynophore topped by sterile ovary in male flowers. Female flowers: carpels 5, subdistinct, superior, alternating at the base with pair of staminodes, ovules 1-2 in each carpel; styles short; stigmas 5, thick. Fruit of 1-6 samaroid carpels, 5-6 cm long, red, wing membranous; seed one.

Asthippara, *KVB 31621*

Fl. & Fr.: December-May

Distribution: Rare in Evergreen forests of Asthippara and Mullenpara.

MELOCHIA L., Sp. Pl. 674. 1753.

Melochia corchorifolia L., Sp. Pl. 675. 1753; Hook. f., Fl. Brit. India 1: 374. 1874; Gamble, Fl. Pres. Madras 110(79). 1915; Manilal & Sivar., Fl. Calicut 51. 1982; Ansari, Fl. Kasaragod Div. 81. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 68. 1988; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3:441. 1993; Subram., Fl. Thenmala Div. 39. 1995; V. Chithra in P. Daniel, Fl. Kerala 1: 462. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 163. 2009.

Erect branched herbs; young stem, petioles, bracts and calyx lobes stellate hairy mixed with simple hairs. Leaves varying in size and shape, simple, alternate, 2-5 x 1-2.5 cm, ovate-oblong acute at apex, cordate or attenuate at base, margin serrate, sparsely hairy on nerves on both sides; petioles to 1 cm long. Flowers in terminal, capitate cymes. Bracts 2-3 mm long, linear-lanceolate, ciliate on margins. Calyx 5-lobed, campanulate, 2-3 mm long; lobes lanceolate, ciliate, Corolla pink, 5, 2-4 mm, petals obovate, obtuse or retuse at apex. Stamens 5, filaments united at base. Ovary c. 1 mm long, ovoid, 5-celled; ovules 2 in each cells; styles 5. Capsule 3-4 mm, sub-globose, 5-valved; seeds angular or plano-convex, dark brown or greyish.

Narikkadavu, *KJD 25595*

Fl. & Fr.: July-April

Distribution: Near river banks.

PTEROSPERMUM Scherber, Gen 2: 461. 1791, *nom.cons.*

- 1a. Leaves less than 5 cm wide, base unequal; petals smaller than sepals *P. rubiginosum*
- 1b. Leaves to 10 cm wide, base equal; petals as long as the sepals *P. diversifolium*

Pterospermum diversifolium Blume, Bijdr. 88. 1825; Hook. f., Fl. Brit. India 1: 367. 1874; Gamble, Fl. Pres. Madras 108 (78). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 68. 1988; Chandra in B.D. Sharma & Sanjappa, Fl. India 3: 449. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 465. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 164. 2009. *Pterospermum glabrescens* Wight & Arn., Prodr. 69. 1834.

Trees, to 18 m high, bark 4-5 mm thick, surface brown mottled with green and white, fibrous; branches horizontal. Leaves simple, alternate, distichous, 15-30 x 12.5-25 cm, rectangular-oblong or oblong or rarely panduriform, apex acuminate, base cordate or truncate, very variable in young plants and coppice shoots, margin entire, glabrous above, silvery pubescent beneath, coriaceous; nerves 5-7 from base, palmate, prominent, lateral nerves 5-9 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole 10-17 mm long, stout, furfuraceous; stipules lateral, 7 x 4 mm, cauducous. Flowers bisexual, white, axillary, solitary or geminate. Calyx tubular, rusty tomentose outside, grey-pubescent within 5-fid; lobes 10-13 x 0.5-1 cm, linear-lanceolate, furfuraceous. Petals 5, oblong, white, deciduous. Staminal column adnate to the gynophore, bearing 5 groups of 3 stamens each between staminodes. Ovary superior, within the apex of column, 5-celled, ovules many; style entire. Fruit a capsule, 10-12.5 x 2-2.5 cm, oblong, 5-angled, smooth; seeds 8-11 in each cell, winged at one end.

Kariyankappu, *KJD 31855*

Fl. & Fr.: October-April

Distribution: Common in plantations of Kariyankappu and Evergreen forests of Crossway.

Pterospermum rubiginosum Heyne ex Wight & Arn., Prodr. 68. 1834; Hook. f., Fl. Brit. India 1: 368. 1874; Gamble, Fl. Pres. Madras 109(78). 1915; Chandra in B.D. Sharma & Sanjappa, Fl. India 3: 451. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 467. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 165. 2009.

Evergreen trees, to 20 m high, bark 5-6 mm thick, brown, flaking off in thin rectangular strips; branchlets tawny pubescent; branches drooping. Leaves simple, alternate, 4-8.5 x 2-3 cm, ovate or ovate-lanceolate or elliptic-ovate, apex acuminate, base oblique, margin entire, glabrous above and densely white tomentose beneath, coriaceous; 3-5-ribbed from base, palmate, lateral nerves 4-6 pairs, pinnate, prominent, intercostae scalariform, slender, prominent; petiole 4-6 mm long, stout, pubescent; stipules lateral, filiform, oblique, densely pubescent, cauducous. Flowers bisexual, white, solitary, axillary. Calyx tubular, cylindrical, brown-hoary outside, splitting into 5 linear lobes, white silky within. Petals 5, white, linear-oblong, slightly smaller than sepals. Staminal column adnate to the gynophore, bearing 5 groups of 3 stamens each between the staminodes, minutely tubercled towards tip. Ovary superior, cylindrical, ridged, tomentose, within the apex of the column, 5-celled, ovules many in each cell; style hairy at base; stigma simple. Fruit a capsule, 40-50 x 6-9 mm, subclavate, acutely 5-angled, brown; seeds winged at one end.

Kurukathode, *KJD 31493*

Fl. & Fr.: November-April

Distribution: Common in Semi-evergreen forests of Kurukathode and Narikkadavu.

Endemic to southern Western Ghats.

PTERYGOTA Schott & Endlicher, Melet. Bot. 32. 1832.

Pterygota alata (Roxb.) R. Br. in Bennett & Br., Pl. Jav. Rar. 234. 1844; Gamble, Fl. Pres. Madras 104(75). 1915; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3: 455. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 469. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 165. 2009. *Sterculia alata* Roxb., Pl. Corom. t. 287. 1820; Hook. f., Fl. Brit. India 1: 360. 1874. *Sterculia heynei* Bedd., Fl. Sylv. t. 230. 1874.

Deciduous trees, to 35 m high, bole straight, buttressed; bark, greyish with light and dark patches, smooth; young parts covered with dense golden brown stellate-pubescent. Leaves simple, alternate clustered towards the end of branches, 10-30 x 7.5-20 cm, ovate or orbicular, apex caudate-acuminate or acuminate, base cordate, subcordate or truncate, margin entire, glabrous, coriaceous 5-7 nerved from base, palmate, lateral nerves 3-6 pairs, pinnate, prominent, intercostae reticulate, slender, prominent; petiole 3.5-10 cm long, slender, glabrous; stipule free, lateral, cauducous. Flowers unisexual or polygamous, to 2 cm long, brownish, in rusty brown tomentose panicles from leafless nodes. Calyx 5-partite, lobes 1 cm long, curved out, tomentose outside. Male flowers: staminal column cylindrical bearing 4-5 phalanges of about 5 anthers each. Female flowers: staminodes round the base of the ovary; carpels 5, free, superior, ovules many in each; style short, recurved; stigma 2-lobed. Fruit of 3-5 follicles, 10-12.5 cm long, obovoid oblique; seeds 25-30, 5-7.5 cm long, oblong, brown winged.

Meenmutty, KJD 26296

Fl. & Fr.: April-May

Distribution: Fairly common in Semi-evergreen forests at Pothanplavu to Meenmutty.

STERCULIA L., Sp. Pl. 1007. 1753.

- 1a. Leaves oblong, not lobed.....*S. guttata*
1b. Leaves palmately lobed.....*S. villosa*

Sterculia guttata Roxb. ex DC., Prodr. 1: 482. 1824; Hook. f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Pres. Madras 106(76). 1915; Manilal & Sivar., Fl. Calicut 51. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 69. 1988; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3: 462. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 472. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 166. 2009.

Deciduous trees, to 20 m high; bole straight; bark 15-25 mm thick, greyish-brownish, smooth, exfoliating in thin scales; branchlets stellate-tomentose. Leaves simple, alternate, 12-25 x 6-15 cm, broadly ovate-oblong, ovate or broadly obovate-oblong, apex acuminate or caudate-acuminate, base obtuse, subcordate or truncate, margin entire, glabrous above, stellate-tomentose beneath, coriaceous; 3-5-ribbed from base, prominent, lateral nerves 5-7 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole 25-50 mm long stout, swollen at both ends, stellate-tomentose; stipules lateral, ensiform, cauducous. Flowers polygamous, white, dotted with pink, arranged in simple cymes of 3, also on peduncle of short rusty-pubescent axillary racemes; bracts lanceolate. Calyx greenish outside, reddish inside,

campanulate, clothed with stellate hairs, united to middle; lobes 5, acute, ultimately reflexed. Petals absent. Male flowers: staminal column recurved, anthers 10-12 arranged at tip, column hairy at apex; bisexual flowers: ovary 5, free, superior, globose, strigose with stellate hairs; gynophore stout, round; style stout, deflexed. Fruit an aggregate of 1-5 radiating follicles, obovoid, red tomentose, smooth and pink within; seeds ovoid, black, smooth, shining.

Kariyenkappu, *KJD 26031*

Fl. & Fr.: September-March

Distribution: Fairly common in plantations of Kariyenkappu and Evergreen forests of Chelachode.

Sterculia villosa Roxb. ex Smith in Rees, Cyclop. 36: n.16. 1816; Hook. f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Pres. Madras 106(76). 1915; K.C. Malick in B.D. Sharma & Sanjappa, Fl. India 3: 472. 1993; V. Chithra in P. Daniel, Fl. Kerala 1: 474. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 167. 2009.

Deciduous trees, to 10 m high, bark pale-brown, smooth with small corky warts; branches horizontal and whorled. Leaves simple, palmately 5-7 lobed, alternate, crowded at the end of branchlets, 6.5-45 x 9-45 cm, lobes oblong-ovate or ovate, apex acuminate or caudate-acuminate, base cordate, margin entire, glabrous above and downy beneath, coriaceous; 5-7-ribbed from the base, palmate, prominent, lateral nerves 4-8, parallel, prominent, intercostae subscalariform-reticulate, prominent; petioles 7-25 cm long, stout, swollen at base, pubescent; stipules free, lateral, cauducous. Flowers polygamous, cream-coloured, 10-12 mm across, in long drooping panicles. Calyx campanulate, pink, downy outside, glabrous within, divided to the middle, lobes 5, oblong-lanceolate, acute. Petals absent. Male flowers: staminal column recurved; anthers 10, along the rim of staminal column, column hairy at apex; female flowers; carpels 5, free, strigose with stellate hairs; gynophore stout, cylindrical; style stout, hairy, deflexed; staminodes on a ring beneath the ovary. Fruit an aggregate of 2-7 follicles, each 3.5-7.5 cm long, brown, tomentose; seeds many, black, smooth.

Chavachi, *KJD 22522*

Fl. & Fr.: February-April

Distribution: Rare in Evergreen forests of Chavachi.

TILIACEAE

- 1a. Fruits with bristle or prickles.....Triumfetta
1b. Fruits without bristle or prickles.....Grewia

GREWIA L., Sp. Pl. 964. 1753.

- 1a. Flowers in terminal and axillary panicles; fruit entire *G. nervosa*
1b. Flowers in axillary cymes or umbels 2
2a. Trees, stipules foliaceous, auricled; fruit ca 5 mm long..... *G. tiliifolia*
2b. Scandent shrubs, stipules lanceolate, not auricled; fruit 1 cm across 3
3a. Leaves scabrous above; peduncle and pedicels densely brown tomentose *G. gamblei*
3b. Leaves subglabrous above; peduncle and pedicels pubescent *G. unbeliifera*

Grewia gamblei Drumm. ex Dunn in Gamble, Fl. Pres. Madras 117(84). 1915; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3: 498. 1993; P. Daniel, Fl. Kerala 1: 487. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 169. 2009.

Scandent shrubs. Leaves simple, alternate, 4-9 x 2-4 cm, ovate-elliptic to oblong, acute or short-acuminate at apex, rounded or subacute at base, crenate-serrulate at margin, scabrid above, tomentose beneath; 3-nerved; petioles to 9 mm long. Flowers in axillary or extra-axillary umbelled cymes; buds oblong to ovoid-oblong, 1-1.4 cm long, tomentose; peduncles to 2.5 cm long; pedicels to 1.3 cm long. Sepals oblong-lanceolate, 1-1.4 cm long, tomentose outside. Petals oblong-lanceolate, ca. 8 mm long; glands ovoid, ca 3 x 2 mm. Androgynophore well developed. Ovary subglobose, ca. 2 mm across, hirsute; stigma 4-lobed. Drupes deeply 4-lobed, ca. 2 cm across, subglabrous.

Ambalappara, NS &KVB 31375

Fl. & Fr.: April-November

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Endangered.

Grewia nervosa (Lour.) Panigrahi, Taxon 34: 702. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 71. 1988; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3:502.1993; P. Daniel, Fl. Kerala 1: 489. 2005; Sunil & Sivadasan, Fl. Alappuzha Dist. 144. 2009. *Fallopia nervosa* Lour., Fl. Cochinch. 336. 1790. *Microcos paniculata* L., Sp. Pl. 514. 1753; Ansari, Fl. Kasaragod Div. 85. 1985; Anil Kumar et al., Fl. Pathanamthitta 100. 2005. *Grewia microcos* L., Syst. Nat. (ed. 12) 2: 602. 1766; Hook. f., Fl. Brit. India 1: 392. 1874; Gamble, Fl. Pres. Madras 116(83). 1915; Manilal & Sivar., Fl. Calicut 53. 1982; Subram., Fl. Thenmala Div. 42. 1995. *Grewia ulmifolia* Roxb., Fl. Ind. 2:591.1832.

Erect bushy shrubs; young stem, petioles, peduncles and calyx densely stellate pubescent. Leaves simple, alternate, 6-18 x 3-5.5 cm, elliptic-oblong or ovate-lanceolate, apex acute to acuminate, base rounded or cordate, margins subentire to serrulate, densely stellate hairy when young, glabrous on ageing except the nerve on both sides; 3-ribbed; petioles upto 1 cm long. Flowers in axillary and terminal panicles; pedicels c. 1 mm long; bracts 5-6 mm long, linear-lanceolate. Sepals 5, free, 4-6 mm long, oblong-obovate, tomentose without. Petals 5, yellow, 2-3 mm long, ovate. Stamens many; filaments 3-4 mm long. Ovary c. 1 mm across, globose, 2-4-celled; ovules 2 in each cell. Drupe 6-10 mm across, globose, purple on ripening; seeds 1 or 2.

Valayamchal, KJD 26388

Fl. & Fr.: August-April

Distribution: Rare along the boundaries near Farm.

Grewia tiliifolia Vahl, Symb. Bot. 1: 35. 1790; Hook. f., Fl. Brit. India 1: 386. 1874, "tiliaefolia"; Gamble, Fl. Pres. Madras 118(84). 1915; Ansari, Fl. Kasaragod Div. 84. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 71. 1988; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3: 511. 1993; P. Daniel, Fl. Kerala 1: 493. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 171. 2009. *Grewia leptopetala* Brandis, Indian Trees 100. 1906. *Grewia tiliifolia* Vahl var. *leptopetala* (Brandis) Cooke, Fl. Pres. Bombay 142. 1901. *Grewia tiliifolia* Vahl var. *argentea* Burret, Notizbl. Bot. Gart. Berlin-Dahlem. 9: 659. 1926.

Large trees, bark dark brown or greyish-brown, rough, vertically striated; branchlets stellate-tomentose. Leaves simple, alternate, 6-36 x 3-24 cm, broadly ovate or obliquely ovate to round, base obliquely cordate or subcordate, apex acute, margin double serrate or crenate-serrate, glabrescent

above and hoary pubescent beneath, coriaceous; stipules 7-10 mm, lateral, auricled; 5-7-ribbed from base, prominent, lateral nerves 3-6 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole 8-35 mm, stout, swollen tipped, pubescent. Flowers bisexual, yellow, in axillary umbels; peduncle 1.5-2 cm long. Sepals 5, pubescent. Petals 5, yellow, half the length of sepals, entire or notched, densely tomentose outside. Samens many, free, inserted on a glandular torus, gland densely villous on the margin. Ovary superior, globose, hirsute, 2-4-celled, ovules 2-many; style subulate; stigma obscurely lobed, recurved. Fruit a drupe, globose to subglobose, reddish-purple, 2-lobed, sparsely hairy.

Narikkadavu, NS & KVB 31448

Fl. & Fr.: February-June

Distribution: Fairly common in Semi-evergreen forests of Narikkadavu.

Grewia umbellifera Bedd., For. Man. Bot. 37. 1871; Hook. f., Fl. Brit. India 1: 393. 1874; Gamble, Fl. Pres. Madras 117(84). 1915; Manilal & Sivar., Fl. Calicut 53. 1982; Ansari, Fl. Kasaragod Div. 84. 1985; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3: 513. 1993; P. Daniel, Fl. Kerala 1: 494. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 171. 2009.

Large scandent woody shrubs, bark brown, rough. Leaves simple, alternate, 7-12 x 3-6 cm, oblong or elliptic-oblong, acute or acuminate, base rounded or acute, dentate or serrulate, sparsely stellately hairy below when young; 3-nerved at base. Flowers in axillary and terminal umbels, peduncles longer than the petioles. Petals white, oblong, 1 cm long. Drupe yellowish-red, fleshy, 2-4 lobed, glabrous.

Chavachi, NS & KVB 31323

Fl. & Fr.: March-May

Distribution: Fairly common in Evergreen forests of Chavachi and Moonamthode. Endemic to Western Ghats.

TRIUMFETTA L., Sp. Pl. 444. 1753.

- 1a. Lower leaves 3-lobed; fruit 5 mm across..... *T. rhomboidea*
- 1b. All leaves entire; fruit 1 cm or more across 2
- 2a. Fruit 1 cm across, bristle glabrous..... *T. annua*
- 2b. Fruit 2-2.5 cm across, bristle hairy..... *T. pilosa*

Triumfetta annua L., Mant. Pl. 1: 73. 1767; Hook. f., Fl. Brit. India 1: 396. 1874; Gamble, Fl. Pres. Madras 120(86). 1915; Manilal & Sivar., Fl. Calicut 52. 1982; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3: 518. 1993; P. Daniel, Fl. Kerala 1: 496. 2005.

Annual herbs, young shoots glabrescent. Leaves simple, alternate, 10 x 5 cm, ovate, caudate-acuminate, base rounded or subcordate, membranous, serrate, sparsely hairy on both sides, to. Flowers in axillary fascicles. Petals yellow, 4 mm long. Stamens 10, filaments free. Ovary 5-celled; ovules 2 per cell; stigma 5-lobed. Capsule ca. 1 cm across, with bristles.

Ambalappara, NS & KJD 25546

Fl. & Fr.: August-March

Distribution: Common in Evergreen forests of Pothurumi.

Triumfetta pilosa Roth, Nov. Pl. Sp. 223. 1821; Hook. f., Fl. Brit. India 1: 394. 1874; Gamble, Fl. Pres. Madras 120(86). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 72. 1988; P. Daniel & M. Chandra. in B.D. Sharma &

Sanjappa, Fl. India 3: 519. 1993; P. Daniel, Fl. Kerala 1: 496. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 172. 2009. *Triumfetta cana* Blume, Bijdr. 113. 1825; Hook. f., Fl. Brit. India 1: 396. 1874.

Subshrubs; branchlets tomentose. Leaves simple, alternate, 12 x 4.5 cm, ovate-elliptic, apex acute, base obtuse, puberulus above, densely white tomentose below, crenate, basally 3-nerved, to slightly cordate; petiole to 2 cm, stipule lanceolate, 6 mm, pubescent. Cymes axillary, leaf opposed, ca. 5-flowered, yellow; bracts and bracteoles linear. Sepals 9 mm, oblong, acute, long hairy. Petals 8 mm, obovate. Stamens 10, free, unequal, 7 mm; torus 1 mm, disc cupular, fimbriate. Ovary 0.5 mm, pubescent, style 2 mm, stigma capitate. Capsule 2.5 cm across, including recurved bristles, pubescent at base.

Ambalappara, *KJD 26313*

Fl. & Fr.: November-February

Distribution: Rare along the margins of Grasslands and Evergreen forests of Ambalappara.

Triumfetta rhomboidea Jacq., Enum. Syst. Pl. 22. 1760; Hook. f., Fl. Brit. India 1: 395. 1874; Gamble, Fl. Pres. Madras 120(86). 1915; Manilal & Sivar., Fl. Calicut 52. 1982; Ansari, Fl. Kasaragod Div. 85. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 72. 1988; P. Daniel & M. Chandra. in B.D. Sharma & Sanjappa, Fl. India 3: 520. 1993; P. Daniel, Fl. Kerala 1: 497. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 172. 2009. *Triumfetta angulata* Lam., Encycl. 3: 421. 1789. *Triumfetta trilocularis* Roxb., Fl. Ind. 2: 462. 1832. *Triumfetta tungarensis* Billore, Journ. Econ. Tax. Bot. 3: 621. 1982.

Erect, much-branched undershrubs; stem hairy, stellate hairs mixed with simple hairs. Leaves simple, alternate, 2.5-7 x 2.5-6 cm, generally rhomboid-ovate, base rounded or cordate, margins irregularly serrate, apex acute or acuminate, stellate-pubescent to glabrescent; basal ones palmately 3-lobed; petioles up to 4 cm long; stipules 3-4 mm long, subulate. Flowers in terminal or leaf-opposed cymes, 5-6 mm across, shortly pedicellate. Sepals 4-5 mm long, lanceolate, hairy without. Petals yellow, 4-5 mm long, oblong-obovate. Stamens 8-15. Ovary c. 1.5 mm long, ovoid, setose. Capsules 4-5 mm across, subglobose, stellate hairy outside, setose; setae c. 2 mm long, hooked at tip.

Paripode, *KJD 22541*

Fl. & Fr.: August-January

Distribution: Rare along the boundaries near Farm.

ELAEOCARPACEAE

ELAEOCARPUS L., Sp. Pl. 515. 1753.

- 1a. Pyrenes laterally compressed, prominently tubercled *E. tuberculatus*
- 1b. Pyrenes oblong or ovoid, tubercles not prominent 2
- 2a. Young leaves and shoots densely rusty tomentose, leaves curved back *E. recurvatus*
- 2b. Young shoots and leaves glabrous, leaves not curved back 3
- 3a. Anthers with awns, filaments glabrous *E. serratus*
- 3b. Anthers bristly, filaments tomentose 4
- 4a. Petiole to 3 cm long, leaf base acute; fruit globose *E. variabilis*
- 4b. Petiole to 5 cm long, leaf base truncate; fruit oblong *E. munronii*

Elaeocarpus munronii (Wight) Mast. in Hook. f., Fl. Brit. India 1: 407. 1874; Gamble, Fl. Pres. Madras 124(88). 1915; Ramach. & V.J. Nair, Fl. Cannanore

Dist. 73. 1988; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 546.1993; M. Reema et al. in P. Daniel, Fl. Kerala 1: 500. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 173. 2009. *Monocera munroii* Wight, Illustr. 1: 83. 1840 & Ic. t. 952. 1845.

Trees, to 20 m high, bark dark grey, smooth; branchlets sympodial, slender. Leaves simple, alternate, clustered to the tip of branchlets, 4-10 x 1.7-5 cm, ovate or ovate-lanceolate apex acuminate or caudate-acuminate, base round or obtuse, margin crenate or serrate, revolute, glabrous, chartaceous, nerve axils glandular beneath; lateral nerves 3-6 pairs, pinnate, prominent, intercostae reticulate, slender, prominent; petiole 25-50 mm, very slender, glabrous, slightly swollen at tip and base; stipules free, lateral, cauducous. Flowers bisexual, white, in short drooping axillary racemes. Sepals 5, 8 mm long, lanceolate, thinly tomentose. Petals 5, white with reddish lines at base, ovate-lanceolate, laciniate, densely silky on both sides, inserted round the base of glandular disc. Stamens numerous, inserted between the glands on the disc; anthers awned with long bristle. Ovary densely superior, silky hairy, placed on the torus, 2-celled, ovules 2 in each cell; style subulate, entire. Fruit a drupe, blue, oblong, terete, glabrous, glaucous; stone 1 or 2 seeded.

Mullenppara State Boundary, *KJD 26057*

Fl. & Fr.: September-April

Distribution: Rare in Evergreen forests of Mullenppara and Katikari. Endemic to southern Western Ghats.

Elaeocarpus recurvatus Corner, Gard. Bull. Straits Settlm. 10: 319,325. 1939; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 549. 1993; M. Reema et al. in P. Daniel, Fl. Kerala 1: 501. 2005. *Elaeocarpus ferrugineus* (Wight) Bedd., Fl. Sylv. t. 112. 1871, *nom. illeg.*; Hook. f., Fl. Brit. India 1: 406. 1874; Gamble, Fl. Pres. Madras 124(88). 1915. *Monocera ferruginea* Wight, Ic. t. 205. 1839, non jack. 1830.

Trees, to 13 m high; bole buttressed; young branches and leaves covered with rusty tomentum. Leaves simple, alternate, clustered at the tip of branchlets, 7.5-15 x 4-8 cm, ovate or ovate-oblong, folded back, boat shaped, apex acute or caudate, base acute or cuneate, margin crenate or serrulate, glabrous above except downy midrib, softly pubescent beneath, coriaceous; lateral nerves 6-10 pairs, pinnate, prominent, veins dividing dichotomously towards the margin, intercostae reticulate, obscure; petiole 15-50 mm, stout, tomentose; stipules free, lateral, cauducous. Flowers bisexual, white, in short axillary racemes to 7 cm. Sepals 5, lanceolate, pubescent. Petals 5, 1.2 cm long, broadly ovate, sparsely within, inserted round the base of glandular disc. Stamens numerous, inserted between the glands on the disc; anthers ending in straight bristle; ovary superior, subglobose, densely silky outside, 3-celled, ovules 2 in each cell; style subulate, entire. Fruit a drupe, ovoid; stone single, compressed, coarsely tubercled; seed one.

Ambalappara, *KJD 26364*

Fl. & Fr.: February-May

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Elaeocarpus serratus L., Sp. Pl. 515. 1753, **var. serratus**; Hook. f., Fl. Brit. India 1:401.1874; Gamble, Fl. Pres. Madras 124(88). 1915; Ansari, Fl.

Kasaragod Div. 86. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 74. 1988; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 553. 1993; Zmarzty, Kew Bull. 56: 434. 2001; M. Reema et al. in P. Daniel, Fl. Kerala 1: 502. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 174. 2009. *Elaeocarpus oblongus* Gaertn., Fruct. 1: 202. t. 43. 1788.

Trees, to 20 m high, aerial roots on large buttresses; bark 8-10 mm thick brown, mottled with grey; branchlets, petioles, peduncles and young leaves densely pubescent. Leaves simple, alternate, 5-14 x 2-6.2 cm, elliptic-obovate or elliptic ovate, apex acute, caudate-acuminate or obtusely acuminate, base acute or cuneate, margin crenate-serrate, glabrous, coriaceous; petiole 15-40 mm, slender, pubescent, swollen tipped, with 2 minute glands at tip; lateral nerves 3-8 pairs, pinnate, prominent, intercostae reticulate, slender, prominent, domatia glandular. Flowers bisexual, white, in axillary racemes to 8 cm long. Sepals 5, ovate, pubescent on outside, densely glandulose, valvate. Petals 5, lacinate, inserted round the base of glandular disc. Stamens many, inserted between the glands on the disc; anthers not awned, tipped with hairs. Ovary superior, densely tomentose, raised on torus, 3-celled, ovules 2 in each cell; style subulate, entire. Fruit a drupe, subglobose, green, style persistent; stone tubercled; seed one.

Near Farm, KVB 31203; Ambalaspura, NS & KVB 31409

Fl. & Fr.: April-November

Distribution: Common in Semi-evergreen forests of Valayamchal, Narikkadavu and Kariyenkapu.

Elaeocarpus tuberculatus Roxb., Fl. Ind. 2: 594.1832; Hook. f., Fl. Brit. India 1:404.1874; Gamble, Fl. Pres. Madras 124(88). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 74. 1988; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 559. 1993; M. Reema et al. in P. Daniel, Fl. Kerala 1: 503. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 174. 2009. *Monocera tuberculata* (Roxb.) Wight & Arn., Prodr. 83. 1834.

Trees, to 25 m high, bole buttressed; bark 10-12 mm thick, grey mottled with white, smooth; young stem, buds, petioles and peduncles densely brown villous; branches monopodial. Leaves simple, alternate, clustered at the tip of branchlets, 8-24 x 4-15 cm, obovate, base cuneate or round, apex acute, obtuse or retuse, margin distantly serrate or crenate or subentire, glabrous above, ferruginous pubescent beneath; lateral nerves 8-12 pairs, parallel, the margin prominent, intercostae scalariform, slender, prominent, domatia present; petiole 15-30 mm, stout, pubescent, swollen tipped; stipules free, lateral, brown-villous. Flowers bisexual, white, in axillary racemes to 12 cm long; pedicel 2 cm long, deflexed. Sepals 5, lanceolate, tomentose outside, valvate. Petals 5, white, fimbriate, fulvous tomentose inserted round the base of glandular disc. Stamens numerous, inserted between the glands on the disc; anthers thinly tomentose, terminating in long bristle. Ovary superior, subglobose, densely tomentose, placed on raised torus, 2-celled, ovules 2 in each cell; style subulate, tomentose, entire. Fruit a drupe, 3-3.5 x 2.5 cm, oblong or ellipsoid, green, ferruginous tomentose, stones single, compressed, coarsely tuberculate, 1-2-celled.

Kariyankappu , KVB 31799

Fl. & Fr.: December-August

Distribution: Common in Semi-evergreen forests of Pookundu and Kariyankappu and Evergreen forests of Chavachi near waterbodies.

Elaeocarpus variabilis Zmarzty, Kew Bull. 56: 429. 2001. *Elaeocarpus oblongus* sensu Mast. in Hook.f., Fl. Brit. India 1: 403. 1874, non Gaertn. 1788; Gamble, Fl. Pres. Madras 124(88). 1915. *Craspedum tectorium* Lour., Fl. Cochinch. 336. 1790. *Elaeocarpus tectorius* (Lour.) Poir. in Lam., Encycl. Suppl. 2: 704. 1812; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 559. 1993. *Elaeocarpus glandulosus* sensu auctt. Ramach. & V.J. Nair, Fl. Cannanore Dist. 73. 1988; S.K. Murti in B.D. Sharma & Sanjappa, Fl. India 3: 539. 1993; Mohanan & Sivad., Fl. Agasthyamala 119. 2002, non Wall. ex Merr. 1951; M. Reema et al. in P. Daniel, Fl. Kerala 1: 499. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 173. 2009.

Trees, bole buttressed; bark greyish-brown; branchlets, young leaves and buds densely pubescent. Leaves simple, alternate, 5-12 x 2.3-6.5 cm elliptic-ovate, elliptic-obovate, elliptic-oblong or ovate, apex abruptly acuminate with emarginate tip, base cuneate or acute, margin distantly crenate or serrate, glabrous on both sides, coriaceous, punctate, domatia glandular; lateral nerves 4-8 pairs, pinnate, slender, prominent, intercostae reticulate, slender, faint; petiole 15-35 mm, slender, pubescent when young, swollen at base and tip, 2 minute glands at tip; stipules lateral, caudous. Flowers bisexual, white, in axillary and terminal racemes; peduncle puberulus when young; pedicel 3 mm long. Sepals 5, 4-5 mm, ovate-lanceolate, puberulous outside, glandular inside. Petals 5, white, 6-8 mm, lacinate, glandular, inserted round the base of glandular disc. Stamens many, inserted between the glands on the disk; anthers tipped with hairs. Ovary superior, subglobose, placed on a raised torus, densely hairy outside, 3-celled, ovules 2 in each cell; style subulate, entire. Fruit a drupe, 2.5 x 2.5 cm, oblong, stone one.

Ambalappara, NS &KVB 31306

Fl. & Fr.: May-October

Distribution: Fairly Common in Evergreen forests of Ambalappara and Mullenpara.

Endemic to Western Ghats.

LINACEAE

HUGONIA L., Sp. Pl. 2: 675. 1753.

Hugonia bellii Sedgw., Indian For. 46: 424. 1920; Ramach. & V.J. Nair, Fl. Cannanore Dist. 74. 1988; Hajra in B.D. Sharma & Sanjappa, Fl. India 3: 574. 1993; J.L. Ellis & W. Arisdason in P. Daniel, Fl. Kerala 1: 506. 2005.

Scandent shrubs, densely tomentose. Leaves simple, alternate, 7-20 x 2-7 cm, narrowly obtuse or acute at apex, tapering at base, ferruginous-tomentose; nerves conspicuous on both surfaces; petioles 6-11 mm long, tomentose; stipules linear, lacinate, ca 15 mm long. Flowers in axillary in groups of 2 or more. Lower peduncles modified into circinate hooks; upper ones ca 15 mm long; bracts ca. 1 cm long. Sepals ovate, acute, 6 x 5 mm. Petals ca. 15 mm long, yellow, withering quickly. Stamens 10, 10 mm long; filaments unequal. Ovary globose; styles filiform; stigma 2-lobed. Drupes globose, ca 2 mm, longitudinally striate, 10-loculed and dark brown; seeds compressed.

Chavachi, NS &KVB 31304

Fl. & Fr.: December-March

Distribution: Common in Semi-evergreen forests of Narikadavu and Kariyenkappu and Evergreen forests of Chavachi.

Endemic to southern Western Ghats.

OXALIDACEAE

- 1a. Leaves pinnate..... Biophytum
1b. Leaves trifoliolate..... Oxalis

BIOPHYTUM A. P. de Candolle, Prodr. 1: 689. 1824.

Biophytum reinwardtii (Zucc.) Klotzsch. in Peters Reise Mossamb. Bot. 1: 85. 1861, **var. reinwardtii**; Hook. f., Fl. Brit. India 1: 437. 1874; Gamble, Fl. Pres. Madras 133(95). 1915; Manilal & Sivar., Fl. Calicut 55. 1982; Ansari, Fl. Kasaragod Div. 87. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 76. 1988; Manna in Hajra et al., Fl. India 4: 236. 1997; N.P. Balakr. & W. Arisdason in P. Daniel, Fl. Kerala 1: 573. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 178. 2009. *Oxalis reinwardtii* Zucc., Abh. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. 1: 274. 1829-1830.

Annual herbs up to 15 cm long. Leaves 12-17 jugate; rachis 4-7.5 cm, sparsely puberulous; leaflets overlapping, terminal largest, to 13 x 5 mm, asymmetric, obovate. Flowers umbellate in many flowered axillary peduncles; pedicels to 6 mm long; bracts ovate-attenuate, 1-1.5 mm long. Sepals 2-2.5 x 1-1.25 mm, ovate, acute-acuminate at apex, 7-nerved, half as long as petals in flower, 2/3 as long as in fruits. Petals yellow, 3.5-4.5 mm long, elliptic to oblanceolate, emarginated at apex; claw greenish, limb yellow. Fruits 3-3.5 x 2-2.5 mm, glandular hairy on the ribs; seeds 1-2 per cell, to 1.2 x 0.8 mm, transversely ridged and tubercled.

Pukundu, *KJD 26200*

Fl. & Fr.: July-December

Distribution: Common along the boundaries of forests.

OXALIS L., Sp. Pl. 433.1753.

Oxalis corniculata L., Sp. Pl. 435. 1753; Hook. f., Fl. Brit. India 1: 436. 1874; Gamble, Fl. Pres. Madras 132(94). 1915; Manilal & Sivar., Fl. Calicut 55. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 77. 1988; Manna in Hajra et al., Fl. India 4: 242. 1997; N.P. Balakr. & W. Arisdason in P. Daniel, Fl. Kerala 1: 577. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 179. 2009. *Oxalis corniculata* L. *var. hispida* Blatt., J. Bombay Nat. Hist. Soc. 34: 898. 1931.

Prostrate herbs with creeping stem, rooting at lower nodes. Leaves digitately 3-foliolate; leaflets 0.5-1.5 x 0.6-2 cm, broadly obcordate, apex emarginate, base cuneate; petioles 1.5-3 cm long. Flowers yellow, solitary or in axillary umbels; peduncles 4-10 cm long; pedicels 0.5-1 cm long; bracts 2, 3-4 mm long, linear-lanceolate. Sepals 5, 2-3 mm long, ovate-lanceolate. Petals 5, 5-6 x 3-4 mm, ovate-lanceolate. Stamens 10, in two rows. Ovary 5-celled; ovules many; styles 5, distinct. Capsules 0.8-1.5 x 0.3-0.5 cm, linear, puberulous outside; seeds many, minute, brown.

Ambalappara, *KJD 26267*

Fl. & Fr.: March-December

Distribution: Fairly common in Evergreen forests of Asthippara.

BALSAMINACEAE

IMPATIENS L., Sp. Pl. 937. 1753.

- 1a. Plants scapigerous..... 2
1b. Plants epiphytic, herbs or small shrubs..... 5
2a. Lip not spurred..... 3
2b. Lip spurred..... 4
3a. Bract large, leafy, green..... *I. veerapazhasii*

3b. Bract small, not leafy	<i>I. stocksii</i>
4a. spur smaller than wing petals, dorsal auricles present.....	<i>I. lawsonii</i>
4b. Spur larger than wing petals, dorsal auricles absent.....	<i>I. scapiflora</i>
5a. Epiphytic herbs	<i>I. jerdoniae</i>
5b. Annual herbs or perennial small shrubs or herbs	6
6a. Dorsal auricles present	<i>I. goughii</i>
6b. Dorsal auricles absent	7
7a. Leaves alternate, perenial.....	<i>I. hensloviana</i>
7b. Leaves opposite, annual.....	8
8a. Spur absent or inconspicuous.....	<i>I. herbicola</i>
8b. Spur present, conspicuous.....	9
9a. Spur equal to or smaller than wings	<i>I. diversifolia</i>
9b. Spur longer than wings	10
10a. Spur not curved	<i>I. chinensis</i>
10b. Spur curved	11
11a. Spur cylindrical, flower more than 2cm across	<i>I. fasciculata</i>
11b. Spur narrow, flowers less than 1.5 cm across	<i>I. minor</i>

Impatiens chinensis L., Sp. Pl. 937. 1753; Gamble, Fl. Pres. Madras 139(99). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 78. 1988; Vivek. et al. in Hajra et al., Fl. India 4: 131. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 182. 2009; Jyosna & Janarthanam, Rheedeia 21: 40. 2011. *Impatiens chinensis* L. var. *brevicornis* E. Barnes, J. Indian Bot. Soc. 18: 99. 1939; Vivek. et al. in Hajra et al., Fl. India 4:121.1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 534. 2005.

Annual herbs, up to 60-70 cm tall, stem terete, channeled. Leaves simple, opposite, 2-6 (7) cmlong, breadth 1-4 mm , linear-oblong, Acuminate, rounded or sub cordate, Sparsely hairy above, coriaceous, glaucous beneath; margin sparsely serrate, lateral nerves not prominent; stipules subulate, petiole absent or veryshort. Flowers axillary, solitary or fascicle of 2-3, 1.5-3 cm across, purple flowers, pedicels slender, longer than leaf, 3-4 in flowers; sepals linear acute; lip boat shaped; spur slender, straight, basal portion bulged and slightly curved; standard orbicular; wings 2-lobbed. Capsules 1-2 cm long, ellipsoid, turgid in middle. Seeds many, oblong, black shiny.

Ambalappara KJD 25494

Fl. & Fr.: June-January

Distribution: Common in Evergreen forests of Ambalappara and Mullenpara and also grasslands.

Note: *Impatiens chinensis* L. is with curved spur but forma *longicalcarata*, by Bhaskar has 3.5-4 cm straight spur, not bulged in the middle. But our specimen has 3-4 cm spur with bulging in the middle.

Impatiens diversifolia Wall. ex Wight & Arn., Prodr. 139. 1834; Hook. f., Fl. Brit. India 1: 446. 1874; Gamble, Fl. Pres. Madras 140(99). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 79. 1988; Vivek. et al. in Hajra et al., Fl. India 4: 141. 1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 539. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 183. 2009; Jyosna & Janarthanam, Rheedeia 21: 45. 2011.

Diffuse, flaccid herbs, 15-40 cm high; stems rooting at lower nodes. Leaves simple, opposite, 1-8 x 0.8-1.2 cm; lower ones short-petioled, elliptic or oblong; the upper sessile, linear-oblong or ligulate, cordate at base; stipules obscure, glandular. Pedicels 1-2 cm long, pubescent, deflexed in fruit. Flowers

ca. 2 cm across, axillary, solitary or 2-nate, pink or rose. Lateral sepals linear, acuminate; spur filiform, 1-1.5 cm long; standard small; wings semiobovate, ca 1.2 x 0.8 cm. Capsules ellipsoid, ca 8 mm long, turgid; seeds globose, smooth, shining, dark brownish.

Ambalappara, *KJD 25493*

Fl. & Fr.: June-November

Distribution: Common in Grasslands of Ambalappara.

Endemic to Western Ghats.

Impatiens fasciculata Lam. *Encycl.Method.* 1:363. 1785; Wt. & Arn. *Prodromus* 138.1834; Wt. *Ic. T.* 748.1844; Hooker, W.J. in *Curtis Bot. Mag.* 8: P. & t. 4631. *Impatiens vivekananthanii* J. Dessai & Janarth., *Rheedea* 21: 58. 2011.

Herbs, 60-70 cm high; stem erect, quadrangular, succulent, subsucculent at base, slightly swollen at nodes, glabrous. Leaves simple, opposite-decussate, sessile or subsessile, linear-oblongate to spatulate, 3.5-7 X 0.5-1.2 cm, acute to apiculate at apex, truncate at base, distantly serrate at margins, coriaceous, scabrid above, glabrous below, obscurely nerved; petioles decurrent on stem and terminating in glands. Flowers 2 or 3 (4) per axil, 2-3 cm across, pink with maroon throat; bracts triangular. Lateral sepals linear to linear-oblongate, acuminate at apex, pinkish white, 3-nerved; nerves minutely hairy, pinkish red. Standard petal reniform, concave, glabrous, white to pinkish white, dorsally keeled; keel mucronate at apex, wing petals, 2-lobed; basal lobe acute to rounded at apex; distal lobe much larger than basal lobe, obtuse at apex, notched towards inner side much below apex; lip conical, glabrous to sparsely minutely hairy, dark pink-nerved, pink; spur tubular, 2-4 cm long, notched at apex, glabrous to sparsely minutely hairy, thick, pinkish white, anthers 10, yellow. Pistil ca. 5 mm long. Ovary asymmetrically oblongoid, glabrous.

Ambalappara, *KJD 26301, NS & KJD 26125*

Fl. & Fr.: July-January

Distribution: Common in Grasslands of Ambalappara. Endemic to Western Ghats

Note: The present collection from the Sanctuary is a new record of occurrence for Kerala.

Impatiens goughii Wight, *Illustr.* 1: 160. 1840; Hook. f., *Fl. Brit. India* 1: 452. 1874; Gamble, *Fl. Pres. Madras* 144(102). 1915; Vivek. et al. in Hajra et al., *Fl. India* 4: 152. 1997; N.C. Rathakr. et al. in P. Daniel, *Fl. Kerala* 1: 542. 2005. *Impatiens anamallayensis* Bedd., *Ic. t.* 150. 1868-1874. *Impatiens microtheca* Hook.'s *Ic. Pl.* 30: t. 2910. 1910.

Annual herbs, 5-30 cm high; stems simple or branched. Leaves simple, opposite, 1.5-3.5 x 0.8-1.5 cm, ovate, subacute at apex, crenate-serrulate along margins, glabrous, rarely hairy below; petioles up to 2 cm long. Flowers in terminal subumbels, pale pink; peduncles 2-5 cm long; pedicels up to 1.5 cm long; bracts persistent, minute, lanceolate. Lateral sepals falcate, ca. 2 mm long. Lip cymbiform; spur shorter than wings, straight. Standard obovate, mucronate at the reflex apex; wings bilobed; basal lobes oblong, rounded at apex; distal lobes longer than basal ones; dorsal auricle produced into the spur. Capsules ellipsoid, 3-5 mm long; seeds 6-12, almond-shaped, chestnut-coloured, granular with hairs.

Ambalappara, *KJD 25438*

Fl. & Fr.: July-December

Distribution: Common in Evergreen forests of Ambalappara. Endemic to Western Ghats.

Impatiens hensloviana Arn., Comp. Bot. Mag. 1:322.1836; Hook. f., Fl. Brit. India 1:458.1874; Gamble, Fl. Pres. Madras 143(102). 1915; Vivek. et al. in Hajra et al., Fl. India 4: 155. 1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 543. 2005. *Impatiens albida* Wight, Madras J. Lit. Sci. ser. 1, 5: 7. 1837 & Ic. t. 743. 1844.

Shrubs, stem with prominent leafscars. Leaves simple, opposite decussate, 9 x 3 cm, lanceolate, acuminate, base cuneate, serrate, with stipitate glands at the base of the lamina, pubescent; petiole to 3 cm, ebracteate. Flowers solitary, white, pedicels to 9 cm. Lip to 2 cm, pubescent; spur to 1.5 cm. Lateral sepals ovate, mucronate. Petals 3.5 cm, white. Capsule ellipsoid, puberulus; seeds papillose.

Ambalappara, *NS & KJD 31942*

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Ambalappara.

Impatiens herbicola Hook. f., Bull. Misc. Inform. Kew 1911: 354. 1911; Gamble, Fl. Pres. Madras 141(100). 1915; Vivek. et al. in Hajra et al., Fl. India 4: 156. 1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 544. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 184. 2009.

Branched glabrous herbs, 25 cm high, erect. Leaves simple, opposite, to 4.5 x 0.5 cm, linear-oblong, nearly entire, young ones pubescent above. Flowers paired, axillary; pedicels 1.5 cm long, pubescent on one side along a line. Lip 5 x 2 mm, boat-shaped, cuspidate, hairy; spur inconspicuous. Sepals 4.5 mm long, linear, pubescent. Standard petal 3 x 3.5 mm, obovate; keel ciliate, produced into a short cusp; wings 5 x 2 mm, 2-lobed; basal lobe shorter, dorsal auricle minute. Capsule 7-10 mm long, glabrous; seeds many, glabrous, dark-brown.

Ambalappara, *KJD 25453*

Fl. & Fr.: August-October

Distribution: Rare in the Grasslands and Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Impatiens jerdoniae Wight, Madras J. Lit. Sci. ser. 1, 5: 8. 1837; Hook. f., Fl. Brit. India 1: 460. 1874; Gamble, Fl. Pres. Madras 139(99). 1915; Vivek. et al. in Hajra et al., Fl. India 4: 159. 1997; Muktesh, Epiphytic Fl. Western Ghats 60. 1998; Swarup. et al., Shola For. Kerala 43. 1998; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 545. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 185. 2009.

Succulent herbs, 8-16 cm high; stem tumid, green or yellow. Leaves a few, alternate, 5-7 cm long, elliptic, glandular-ciliate at base and on top of petiole, serrate at margin, few-nerved. Flowers solitary or 2-nate, 3.5-5 cm long; pedicels 2-7 cm long; bracts setaceous. Lateral sepals elliptic, green. Lip laterally compressed, scarlet; spur large, ventricose, wrinkled. Standard petal orbicular, apiculate, narrowly keeled on back, yellow; wings 2-lobed, concealed under lip, yellow; lobes rounded, overlapping. Capsule ellipsoid.

Ambalappara, *KJD 26157*

Fl. & Fr.: August-November

Distribution: Common epiphyte on trees in Evergreen forests of Ambalappara. Endemic to Western Ghats.

Impatiens lawsonii Hook. f., Rec. Bot. Surv. India 4: 45. 1906; Gamble, Fl. Pres. Madras 139(99). 1915; Vivek. et al. in Hajra et al., Fl. India 4: 170. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 185. 2009.

Epiphytic annual scapigerous tuberous herbs, up to 15 cm tall. Leaves simple, radical, 2 x 1.2 cm, ovate, crenate, obtuse or rounded, sparsely hairy above; petioles up to 2 cm long. Flowers ca. 1 cm across, white, in 4-6-flowered straight scapes; bracts ca 1.5 mm long, persistent; pedicel filiform, in fruit ca 2 mm long, glabrous. Sepals ovate, acuminate, 3-4-nerved. Lip funnel-shaped, spur conical. Wing petals 3-lobed, ca 1.5 cm long, dorsal auricle short, spiniferous, pale pink with yellow tinge at centre, whitish outside; standard hook-like, enclosing the stamens. Capsules 5-7 mm long, ovate, raised in the centre, glabrous; seeds powdery, minute, hairy.

Ambalappara, *KJD 25451*

Fl. & Fr.: August-October

Distribution: Common in Evergreen forests of Ambalappara on wet rocks and trees. Endemic to southern Western Ghats.

Impatiens minor (DC.) Bennet, Indian J. For. 2: 283. 1979; Ansari, Fl. Kasaragod Div. 89. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 80. 1988; Vivek. et al. in Hajra et al., Fl. India 4: 181. 1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 550. 2005; Jyosna & Janarthanam, Rheedia 21: 49. 2011. *Balsamina minor* DC., Prodr. 1: 686. 1824. *Impatiens kleinii* Wight & Arn., Prodr. 140.1834; Hook. f., Fl. Brit. India 1:445.1874; Gamble, Fl. Pres. Madras 140(100).1915; Vajr., Fl. Palghat Dist. 100.

Slender glabrous branched herbs. Leaves simple, opposite, 5 x 2 cm elliptic-lanceolate, or oblong-obovate, acute or acuminate, base acute, serrulate, with a pair of stalked glands at the base; petiole to 5 mm long. Flowers pink-violet, 8 mm across; pedicels slender, 1-1.5 cm long, deflexed in fruits. Sepals linear-subulate; spur slender, to 1.5 cm long. Standard petal orbicular; wings broadly ovate, entire, clawed. Capsule linear, 2 cm long; seeds black.

Kariyenkappu, *KJD 26054*

Fl. & Fr.: August-December

Distribution: Common along the boundaries of Forests and also in Evergreen forest of Meenmutty. Endemic to Peninsular India.

Impatiens scapiflora Heyne ex Roxb., Fl. Ind. 2: 464. 1824; Hook. f., Fl. Brit. India 1:443. 1874; Gamble, Fl. Pres. Madras 138 (98). 1915; Ansari, Fl. Kasaragod Div. 89. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 80. 1988; Vivek. et al. in Hajra et al., Fl. India 4: 208. 1997; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 557. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 187. 2009; Jyosna & Janarthanam, Rheedia 21: 35. 2011. *Impatiens rivalis* Wight, Ic. t. 751. 1844.

Stemless scapigerous herbs. Leaves simple, radical, 13 x 8 cm, ovate, obtuse, cordate at base, glabrous; petiole 10-20 cm long. Scape to 35 cm long; Flowers ca. 4 cm across, confined towards the apex of peduncle; bracts 5-8 mm long, ovate, acute; pedicels 4-5 cm long. Sepals 4 x 3 mm, ovate, acute. Lip ovate, obtuse, spur 4-5 cm long, glabrous. Standard petal concave at base, obtuse at apex; lobes of wing petals subequal, oblong, obtuse. Capsule 1.2 cm long, ellipsoid, glabrous; seeds glandular-hairy.

Ambalappara *KJD 26128*, Meenmuttytti *KJD 26176*

Fl. & Fr.: July-December

Distribution: Common in Evergreen forests of Ambalappara, Meenmutty, Moonamthode and Chavachi on wet rocks. Endemic to Western Ghats.

Note: *I. scpiiflora* from Sanctuary shows variations with respect to altitude. The leaves of *I. scpiiflora* from high (+ 1,400 m) altitude show similarity with *I. levingei*.

Impatiens stocksii Hook.f. & Thoms., J. Linn. Soc. Bot. 4: 156. 1860; Hook. f., Fl. Brit. India 1: 442. 1874; Gamble, Fl. Pres. Madras 1879 (1294). 1936; Jyosna & Janarthanam, Rheedia 21: 37. 2011. *Impatiens crenata* sensu Ramach. & V.J. Nair, Fl. Cannanore Dist. 78. 1988; N.C. Rathakr. et al. in P. Daniel, Fl. Kerala 1: 537. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 183. 2009, non Bedd. 1859.

Slender herbs, to 15 cm high. Leaves simple, radical, 1.5-4.8 x 1.3-1.5 cm, variable, orbicular-reniform, cordate or oblong-ovate, crenate at margin, pubescent above, glabrous beneath; nerves flabellate. Scapes to 10 cm long; bracts ovate, small; pedicels stout, ca 1 cm long. Flowers 3-6 in a raceme, ca. 2 cm across, pink. Lateral sepals ovate, obtuse. Lip cymbiform; spur short or absent. Standard somewhat rhomboid, cucullate, crenate as broad as long or broader; wings 3-lobed; distal lobe longer. Capsules ellipsoid, acute; seeds linear-oblong, minute.

Ambalappara, KJD 25452

Fl. & Fr.: August-November

Distribution: Rare in Evergreen forests of Ambalappara on trees and wet rocks. Endemic to southern Western Ghats.

Impatiens veerapazhasii Ratheesh, Sujanapal & Meera, J. Bot. Res. Inst. Texas 5: 155. 2011.

Epiphytic herbs, to 10 cm long, scapigerous, rhizome 7-8 mm, globose, thick with numerous root hairs. Leaves 2-4, simple, radical, 5-10 x 2-4 cm highly variable, broadly ovate or ovate-lanceolate, rounded or obtusely acute at apex, obliquely cordate or deeply cordate at base, margins distantly serrate, papillate on margins, , glabrous and light green below, many-celled trichomes on upper surface, trichomes to 2 mm; nerves 5-7 pairs, pinkish below; petiole 2-3 cm long with pinkish stripes and spots. Inflorescence scapose, unbranched, 4-8 cm long, glabrous or with trichomes on upper portion, 3-many flowered, racemose. Flowers white with yellow center; 1.5-2 x 2-2.5 cm, pedicel 1.5-2 cm long, glabrous; bracts strongly hairy, persistent, green, leafy, 3-lobed, broadly ovate to rounded, 1-1.5 x 0.8-1.3 cm, many celled trichomes above. Lateral sepals lanceolate, ca. 3 x 2 mm, acute, slightly curved; lower sepal ca. 5 x 4 mm, ovate, spatulate, white, spurless, glabrous. Dorsal petal reniform, ca. 4 x 4 mm; lateral united petals 3-lobed, ca. 13 x 8 mm, white with yellow papillate base, white hairs on upper lobe, upper lobe 5-7 x 2-3 mm, lower lobe 1-1.2 x 0.4-0.8 cm, notch 4-6 mm, dorsal auricle small, 1-2 mm, yellow. Stamens 5, short and broad, anthers cohering. Ovary oblong, 5-celled; ovules many; stigma sessile, 5-lobed. Capsule oblong, ca. 1 cm long, subfalcate, loculicidal dehiscent, valves 5, many seeded; seeds tubercled, ca. 1 x 0.3 mm, oblong, golden yellow, densely hairy on both ends.

Ambalappara, KJD 25437

Fl. & Fr.: July-September

Distribution: Common in Evergreen forests of Ambalappara on wet rocks and trees. Endemic to southern Western Ghats.

Note: New collection locality after its type collection in 2011.

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ACRONYCHIA J.R. Forster & G. Forster, Charact. Gen. 53. 1776, *nom. cons.*

Acronychia pedunculata (L.) Miq., Fl. Ind. Bat. Suppl. 532. 1861; Ramach. & V.J. Nair, Fl. Cannanore Dist. 81. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 392.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 582. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 189. 2009. *Jambolifera pedunculata* L., Sp. Pl. 349. 1753. *Acronychia laurifolia* Blume, Cat. Gew. Buitenz. 63. 1823; Hook. f., Fl. Brit. India 1: 498. 1875; Gamble, Fl. Pres. Madras 152(108). 1915. *Acronychia barberi* Gamble, Bull. Misc. Inform. Kew 1915: 345. 1915 & Fl. Pres. Madras 152(108). 1915.

Evergreen trees, bark greyish-yellow; branchlets stout, terete, glabrous. Leaves unifoliolate, opposite, decussate, 4.3-15 x 1.8-7.5 cm, obovate, obovate-oblong or oblanceolate, apex obtusely acuminate, base acute or cuneate, margin entire, glabrous, chartaceous; rachis 10-30 mm long, slender, glabrous, grooved above; petiolule upto 2 mm, lateral nerves 9-15 pairs, pinnate, slender, prominent, intercostae reticulate, prominent. Flowers bisexual, yellowish-white, in trichotomous, corymbose, axillary cymes; peduncle slender 6-12 cm long. Sepals 4, lobes ovate, connate, margin ciliate. Petals 4, free, oblong, densely hairy within. Stamens 8, 2-seriate; filaments unequal, densely reflexed hairy; disc 8-angled, minutely pubescent. Ovary superior, conical, partly immersed in the disc, 4-angled densely silky outside, 4-celled, ovules 2 in each cell; style stout; stigma 4-grooved. Fruit a berry, subglobose, pale-brown, obscurely lobed; seeds black.

Mullenpara, *KJD 18720*

Fl. & Fr.: March-November

Distribution: Rare in Evergreen forests.

AEGLE Dulac, Fl. Hautes-Pyr. 43. 1867.

Aegle marmelos (L.) Correa, Trans. Linn. Soc. London 5: 223. 1800; Hook. f., Fl. Brit. India 1: 516. 1875; Gamble, Fl. Pres. Madras 161(115). 1915; Manilal & Sivar., Fl. Calicut 58. 1982; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 264. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 583. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 189. 2009. *Crataeva marmelos* L., Sp. Pl. 444. 1753. *Aegle marmelos* (L.) Correa var. *mahurensis* Zate, Indian J. For. 5: 35. 1982.

Trees to 12 m tall, deciduous; branchlets cylindrical, sometimes slightly angled, glabrous; spines axillary, solitary or paired, straight, stout and sharp. Leaves alternate-3-foliolate, sometimes 5-foliolate, dimorphic, leaflets subsessile, ovate-elliptic or elliptic-lanceolate, tapering at apex, oblique at base, shallowly crenate-serrate at margin, membranous, pellucid-punctate, pale green; petioles terete to 6 cm long, glabrous or puberulous when young. Inflorescences axillary and terminal, racemose or corymbose, few-flowered, 4-5 cm long; peduncles densely puberulent; pedicels 2-4 mm long. Flowers bisexual, greenish white or yellow, fragrant. Calyx cupular, finely puberulent, caducous; lobes 4 or 5, 3-angled. Petals 5, ovate-oblong, subequal, ca 12 x 6 mm, spreading, glabrous, fleshy and white. Stamens numerous in 2 or 3 series, free or basally subconnate, unequal; filaments subulate, ca 7 mm long, glandular; anthers linear-oblong, ca 8 mm long. Disc glabrous, greenish. Ovary ovoid, 4-5 mm long, faintly ridged, 10-loculed; ovules many, 2-seriate; style short; stigma oblong, longitudinally grooved. Berries ovoid, 6-10 cm across, woody, yellowish, many seeded; seeds oblong and flat.

Kariyenkappu, *KJD 18749*

Fl. & Fr.: March-May

Distribution: Grown in earlier settlements.

ATALANTIA Correa, Ann. Mus. Natl. Hist. Nat. 6: 383. 1805, *nom. cons.*

- 1a. Staminal filaments united, tubular *A. racemosa*
1b. Staminal filaments free *A. wightii*

Atalantia racemosa Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 64, t. 122. 1834; Hook. f., Fl. Brit. India 1:512.1875; Gamble, Fl. Pres. Madras 159(114). 1915; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 269. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 586. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 190. 2009. *Sclerostylis atalantioides* Wight, Ic. t. 71. 1838, non Wight & Arn. 1834. *Sclerostylis racemosa* (Wight) Wight, Illustr. 1: 109. 1840.

Small trees; branchlets cylindrical, glabrous or minutely puberulous, often armed with strong, axillary spines. Leaves unfoliolate; 4.5-8-15 x 2-4.5 cm, ovate-oblong to oblong-elliptic or obovate, obtuse or shortly acuminate at apex with ca 5 mm long acumen, cuneate at base, crenulate or subentire along margins, dark green above, pale beneath, coriaceous, glabrous, emarginate tip; lateral nerves 8-12 pairs; petioles 5-10 mm long, shallowly channelled above or obscurely marginated, articulate above at base of blade, pubescent to glabrous. Flowers in axillary racemes; peduncles single or sometimes fascicled, up to 4 cm long, pubescent or glabrous; bracteoles subulate, minute, ciliolate; pedicels slender, 3-8 mm long, shortly pubescent to glabrous. Sepals 3-5, triangular to suborbicular, subacute, ca 1.5 mm long, scarious and ciliate along margins. Petals usually 4, broadly elliptic or linear-oblong to obovate, obtuse, 6-8 x 2-4 mm, glandular, penninerved, glabrous, white. Stamens 8, as long as or slightly longer than petals; filaments usually connate into a partial

basal tube, occasionally 1 or 2 free; anthers ovoid or oblong, cordate at base, 1-2 mm long, subdorsifixed. Disk annular, ca 0.5 mm high, ca 1.5 mm fleshy, glabrous; stigma capitate without styler canals. Ovary eglandular, 2-celled. Berry subglobose, 2 cm across.

Meenmutty, *KJD 31499*

Fl. & Fr.: October-January

Distribution: Common in Semi-evergreen forests of Narikkadavu and Paripode and Evergreen forests of Meenmutty.

Atalantia wightii Tanaka, Bull. Soc. Bot. France 75: 714. 1928; Gamble, Fl. Pres. Madras 160(114). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 81. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 274.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 587. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 191. 2009. *Atalantia ceylanica* (Arn.) Oliver, J. Linn. Soc. Bot. 5. Suppl. 2: 25. 1861, p.p. excl. basionym, quoad tantum specim. Nilgiri; Hook. f., Fl. Brit. India 1: 512. 1875; Swarup. et al., Shola For. Kerala 69. 1998.

Shrubs, branchlets minutely hispid. Leaves simple, alternate, 8-11 x 3-5 cm, ovate, apex rounded or emarginate, base acute, glabrous. Raceme to 1 cm long, axillary, pedicels 5 mm long, hispid. Flowers to 12 mm across. Sepals 2 mm long, ovate, acute, ciliate. Petals white, to 9 x 2 mm, oblong, obtuse. Stamens 8, filaments 4 mm long, inner ones smaller; style 5 mm long. Berry ellipsoid, 1-1.5 cm across, smooth, glandular, yellowish; seeds 2-4, oblong-ellipsoid.

Ambalappara, *KVB 31531*

Fl. & Fr.: February-July

Distribution: Fairly common in Evergreen forests of Ambalappara.

CLAUSENA N.L. Burmann, Fl. Indica 87, t. 29, f. 2. 1768.

1a. Flowers 5-merous..... *C. indica*

1b. Flowers 4-merous *C. anisata*

Clausena anisata (Willd.) Hook.f. ex Benth. in Hook., Niger Fl. 256. 1849; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 321.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 593. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 192. 2009. *Amyris anisata* Willd., Sp. Pl. 2: 337. 1799. *Amyris dentata* Willd., Sp. Pl. 2: 337. 1799. *Clausena dentata* (Willd.) Roem., Syn. Hesper. 1: 44. 1846; Sasidh., Fl. Chinnar WLS 56. 1999. *Clausena willdenowii* Wight & Arn., Prodr. 96. 1834; Hook. f., Fl. Brit. India 1:506. 1875; Gamble, Fl. Pres. Madras 155(110). 1915. *Clausena willdenowii* Wight & Arn. var. *nana* (Roxb.) Balakr., Bull. Bot. Surv. India 22: 173. 1982. *Clausena willdenowii* Wight & Arn. var. *pubescens* (Wight & Arn.) Hook.f., Fl. Brit. India 1: 506. 1875. *Clausena willdenowii* Wight & Arn. var. *dulcis* (Bedd.) Bedd., Fl. Sylv. S. India 45. 1871. *Clausena dentata* (Willd.) Roem. var. *dulcis* (Bedd.) Swingle, J. Wash. Acad. Sci. 28: 532. 1938. *Clausena dentata* (Willd.) Roem. var. *pubescens* (Wight & Arn.) Tanaka, J. Bot. 68:277.1930.

Small to medium trees; young branchlets pubescent. Leaves odd pinnate, to 15 cm; leaflets opposite, 5 x 2.5 cm, ovate, elliptic, acuminate, base oblique, dentate. Racemes axillary, to 9 cm; pedicels 0.5 cm; bracts 2 mm. Flowers white, 4-merous. Calyx lobes 1 mm, ovate, pubescent. Petals 4 x 2 mm, concave. Stamens 8, free, filaments dialated below, unequal; anthers 2 mm. Ovary 4 partite, style apical, furrowed, stigma 4-angled. Berry 8 mm across, globose.

Ambalappara, *NS &KVB 31376*

Fl. & Fr.: March-June

Distribution: Fairly common in Evergreen forests of Ambalappara.

Clausena indica (Dalz.) Oliver, J. Linn. Soc. Bot. 5: 36. 1861; Hook. f., Fl. Brit. India 1: 505. 1875; Gamble, Fl. Pres. Madras 155(110). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 82. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 328. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 595. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 193. 2009. *Piptostylis indica* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 33. t.2. 1851.

Shrubs or small trees. Leaves pinnate, alternate, up to 25 cm long ; leaflets 7-13, alternate and opposite, 3.5-7.5 x 2-3.5 cm, elliptic or elliptic-ovate to oblong, obtuse or abruptly acuminate at apex, oblique at base, subentire or crenulate and often with pubescent glands along margins, glabrous, gland dots raised on both surfaces; petiole and rachis slightly zig-zag, puberulous or glabrous petiolules 3-6 mm long, puberulous; lateral nerves 5-8 pairs, faint above, rather prominent beneath, spreading, tertiaries indistinct. Inflorescence terminal, paniculate corymbose cymes, up to 10 cm long, peduncle and branches densely puberulous. Flowers globose in buds, borne on short (2 mm long) pedicels; bracts minute, deltate, ciliate. Sepals deltate, acute or rounded, ca 0.5 mm long, ciliate. Petals oblong, acute, ca 3.5 x 1.2 mm, white, glandular, glabrous. Stamens 10; filaments subulate above, dilated below, ca 2 mm long; anthers ellipsoid, ca 1 mm long. Ovary subglobose, ca 15 mm long, glabrous, papillate-glandular, 3-locular, each with one or two pendulous ovules; style very short, thick, cylindrical, inserted in the depression at top of ovary, caduceus; stigma capitate, broader than style. Berries globose, ca 15 mm across, yellowish-white when ripe; 1-seeded.

Mullenpara, KVB 31476

Fl. & Fr.: February-June

Distribution: Rare in Evergreen forests of Mullenpara.

GLYCOSMIS Correa, Ann. Mus. Natl. Hist. Nat. 6: 384. 1805.

1a. Sepals glabrous, fruit to 1.5 cm across *G. macrocarpa*

1b. Sepals ciliate, fruit to 1 cm across *G. pentaphylla*

Glycosmis macrocarpa Wight, Illustr. 1: 109. 1840; Ramach. & V.J. Nair, Fl. Cannanore Dist. 83. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 338. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 597. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 194. 2009. *Glycosmis pentaphylla* Hook. f. *var. macrocarpa* (Wight) Hook. f., Fl. Brit. India 1:500. 1875.

Shrubs, up to 2 m high. Leaves pinnate, alternate, 13-27 cm long; petiole and rachis glabrous or ferruginously puberulous when young; leaflets 3 or 5 or rarely 6, alternate, 7.5-16 x 3-7.5 cm, oblong-elliptic or ovate-lanceolate to oblanceolate, acuminate at apex, cuneate at base, acumen up to 10 mm long, bluntish at tip, more or less entire along margins, coriaceous, glabrous; lateral nerves 5 to 7 pairs, prominent beneath, faint above, oblique, spreading, tertiaries finely reticulate; petiolules 5-10 mm long, glabrous. Inflorescence usually from uppermost leaf axils, paniculate cymes, up to 3 cm long. Sepals 5, deltate, obtuse, less than 1 mm long, puberulous with ciliolate margins. Petals 5, oblong-elliptic, obtuse, ca 3 x 1.5 mm, white or pale yellowish, obscurely glandular, glabrous. Stamens 10; filament linear, flattened, slightly ridged at inner face almost near apex, subulate above, up to 2 mm long, glabrous; anthers oblong, cordate, aciculate, sometimes with minute dorsal apical gland, less than 1 mm long. Disk broader than ovary, tumid, lobulate, ca 0.5 mm high, glabrous. Ovary ovoid-cylindric, ca 1 mm high, smoothly glandular, glabrous, 5-locular, each with one ovule; style continuous with ovary, not clearly distinct from it, glabrous; stigma minute, depressed. Berries

subglobose, constricted at base, depressed above, ca 2 x 1.5 cm, punctuate; seed 1.

Kurumbankallu, *KJD 26385*

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Kurumbankallu to Kannadivechakunnu.

Glycosmis pentaphylla (Retz.) DC., Prodr. 1:538. 1824, quoad basionym; Hook. f., Fl. Brit. India 1:499.1875, p.p; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4:343.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 599. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 194. 2009. *Limonia pentaphylla* Retz., Obs. Bot. 5: 24. 1788. *Limonia arborea* Roxb., Pl. Corom.t.85. 1798. *Glycosmis arborea* (Roxb.)DC., Prodr. 1:538.1824; Manilal & Sivar., Fl. Calicut 60. 1982; Ansari, Fl. Kasaragod Div. 90. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 83. 1988; Vajr., Fl. Palghat Dist. 104. 1990. *Glycosmis cochinchinensis* Gamble, Fl. Pres. Madras 153(109). 1915p.p, non (Lour.) Pierre ex Engl. 1896.

Erect shrubs. Leaves 3-7-foliolate; leaflets subopposite, 7-15 x 2-5.5 cm, elliptic-lanceolate, acute to round at apex, attenuate at base, entire to minutely crenulate-serrate on the margins, glandular on both sides, glabrous; rachis 6-10 cm long; petiolule c. 2 mm long. Flowers in terminal or axillary, spiciform panicles. Sepals 5(4), 1-1.5 mm long, ovate-acute, ciliate on margins. Petals 5(4), white, 4-5 x 2-2.5 mm, obovate, surface gland-dotted. Stamens 8-10, longer and shorter filaments of longer ones c. 3 mm long, shorter, c. 2 mm long. Disc prominent, annular. Ovary 2-2.5 mm across, ovoid, 5-celled; stigma flat or obscurely lobed. Berry 1-1.2 cm diam., ovoid, white turning pink, 1-2-seeded.

Paripode, *KJD 26315*

Fl. & Fr.: September-April

Distribution: Fairly common along the boundaries at Paripode, near Farm.

LUVUNGA Buch. Hamilton ex Wight & Arnott, Prodr. 90. 1834.

Luvunga eleutherandra Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 258. 1850; Hook. f., Fl. Brit. India 1: 509. 1875; Gamble, Fl. Pres. Madras 157(112). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 84. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 296.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 601. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 195. 2009. *Luvunga sarmentosa* auct. non (Blume) Kurz, 1870: Sivar. & Mathew, Fl. Nilambur 124. 1997.

Woody climbing shrubs, thorns axillary, to 2 cm long, recurved. Leaves 3-foliolate; leaflet 8-12 x 2-4 cm, oblong, apex acute or obtuse, base acute, shining above, nerves obscure; petiole to 6 cm long; petiolule 8 mm long, thick. Cymes to 3 cm across, axillary, sessile or shortly pedunculate. Flowers to 1 cm across, shortly pedicelled. Calyx cupular, shallowly 4-lobes. Petals 4, 8 x 3 mm, oblong. Stamens 8, filaments 4 mm long, anthers cleft at base, oblong. Ovary 4-celled, cell 2-ovuled, style stout, stigma terminal, capitate. Berry to 2.5 x 2 cm, globose-oblong, smooth; seeds 1-4, oblong, covered with mucilaginous pulp.

Kattikari, *KJD 25589*

Fl. & Fr.: December-April

Distribution: Rare in Evergreen forests of Kattikari. Endemic to Western Ghats.

MELICOPE J.R. Forst. & G. Forst., Charact. Gen. 55. 1776.

Melicope lunu-ankenda (Gaertn.) Hartley, Sandakania 4: 61. 1994; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 369.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 603. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 196. 2009. *Fagara lunu-ankenda* Gaertn., Fruct. Sem. Pl. 334, t. 68. f. 9. 1778. *Euodia lunu-ankenda* (Gaertn.) Merr., Philipp. J. Sci. 7:378.1912; Gamble, Fl. Pres. Madras 148(105). 1915; Ansari, Fl. Kasaragod Div. 90. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 83. 1988; Mohanan & Sivad., Fl. Agasthyamala 141. 2002; Anil Kumar et al., Fl. Pathanamthitta 111. 2005. *Zanthoxylum roxburghianum* Cham., Linnaea 5: 58. 1830. *Euodia roxburghiana* (Cham.) Benth., Fl. Hongk. 59. 1861; Hook. f., Fl. Brit. India 1: 487. 1875. *Euodia lunu-ankenda* (Gaertn.) Merr. var. *tirunelvelica* Henry & Chandrab., Bull. Bot. Surv. India 15: 144. 1973; Mohanan et al., Journ. Econ. Tax. Bot. 24(1): 75. 2000.

Deciduous trees, to 18 m high, bark 6-8 mm thick, yellowish-grey, scurfy-muricate, slightly and reticulately fissured, lenticellate; branchlets opposite, minutely pubescent. Leaves trifoliate, opposite; leaflets 3-19.5 x 3-8 cm, elliptic, elliptic-oblongate or lanceolate grading to obovate, leaflets 3-19.5 x 3-8 cm, elliptic, elliptic-oblongate or lanceolate grading to obovate, base acute or cuneate, apex acute or acuminate, margin entire, glabrous, membranous; rachis 40-80 mm long, stout, pubescent, slightly grooved above; petiolules 5-12 mm long; lateral nerves 8-20 pairs pinnate, slender, prominent, intercostae reticulate, faint. Flowers unisexual, white or greenish-yellow, in axillary paniculate cymes, 2-3 mm across; male flowers: ca. 3 mm long; sepals 4, connate at base; ovate-orbicular; petals 4, 2-3 mm long, white, glabrous; stamens 4, inserted at the base of the disc, slightly longer than petals; filaments subulate; anthers oblong; disc annular, thick, 4 or more lobed, densely pubescent; pistillode of 4 rudimentary carpels; female flowers: sepals and petals as in male flowers; staminodes 4, inserted at the base of the disc; ovary superior, subglobose, pubescent abaxially, 4-lobed, 4-celled, ovules 2 in each cell; style short; stigma capitate, 4-grooved. Fruit a capsule, of 4 cocci, each 5-6 mm long, ovoid, brown; seeds oblong, black.

Ambalappara, NS & KVB 31430

Fl. & Fr.: May-October

Distribution: Fairly common in plantations of Kariyenkappu and Evergreen forests of Chavachi and Ambalappara.

MURRAYA G.J. Koenig ex L., Mant. 2: 554, 563. 1771 *nom. cons.*

Murraya paniculata (L.) Jack., Malay. Misc. 1: 31. 1820; Manilal & Sivar., Fl. Calicut 60. 1982; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 352. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 605. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 200. 2009. *Chalcas paniculata* L., Mant. Pl. 1: 68. 1767. *Murraya exotica* L., Mant. Pl. 2: 563. 1771; Hook. f., Fl. Brit. India 1: 502. 1875; Gamble, Fl. Pres. Madras 155(111). 1915.

Shrubs or small trees; bark pale greyish to white. Leaves 3-7-foliolate; leaflets 3-5 x 1.5-3 cm, ovate to elliptic-ovate or rhomboid, shortly acuminate at apex, attenuate at base, glabrous. Panicles few-flowered, from the axils of upper leaves; peduncle 2-3 cm long. Calyx lobes 5, 2.5-3 mm long, ovate. Petals 5, 1-1.5 cm long, elliptic to ovate-elliptic, white. Stamens 10. Disc annular. Ovary c. 3 mm across, oblong, 2-celled; ovules 1 in each cell; stigma capitate. Berry 1-1.2 cm long, ellipsoid, acute, red.

Fl. & Fr.: February-September

Distribution: Rare in Evergreen forests of Ambalappara.

NARINGI Adanson, Fam. 2: 341. 1763.

Naringi crenulata (Roxb.) Nicolson in Saldanha & Nicolson, Fl. Hassan Dist. 387. 1976; Manilal & Sivar., Fl. Calicut 58. 1982; Ansari, Fl. Kasaragod Div. 92. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 84. 1988; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 302. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 606. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 197. 2009. *Limonia crenulata* Roxb., Pl. Corom. t. 86. 1798; Gamble, Fl. Pres. Madras 157(112). 1915. *Hesperethusa crenulata* (Roxb.) Roem., Syn. Monogr. 1: 38. 1846. *Limonia acidissima* sensu Hook.f., Fl. Brit. India 1: 507. 1875, non L.1762.

Trees, to 10 m, armed with sharp solitary or paired axillary spines; bark yellowish-grey, smooth, corky; branchlets angled, glabrous. Leaves imparipinnate, alternate; leaflets 3-7, opposite, sessile, 1-6 x 0.7-2.4 cm, elliptic or elliptic-obovate, apex obtuse to emarginate, base acute or obliquely acute, margin crenate, glabrous, profusely pellucid-gland dotted; glands dimorphic; coriaceous; rachis 2.5-10 cm long, winged, wings obovate-oblong, glabrous, punctate; lateral nerves 4-10 pairs, pinnate, slender, faint, intercostae reticulate, faint. Flowers bisexual, white, in few flowered axillary racemes; pedicel 8-10 mm long. Sepals 4, free or united at base, ovate-orbicular, glandular. Petals 4, free, elliptic or oblong, white, glandular, glabrous. Stamens 8, subequal, free, inserted round the disc; filaments subulate; anthers yellow, apiculate, disc thin, glandular. Ovary superior, globose, 4-celled, glabrous, glandular, ovule 1 in each cell.; style stout; stigma capitate; Fruit a berry, 6-8 mm across, subglobose, bluish-black, glandular; seeds 1-4, dull yellow, smooth.

Uruppukunnu, KJD 26260

Fl. & Fr.: June-December

Distribution: Common in Semi-evergreen forests of Valayamchal, Narikkadavu and Uruppukunuu.

PARAMYGNIA Wight, Ill. Ind. Bot. 108. t. 42. 1838.

- 1a. Leaves elliptic, caudate acuminate; calyx 4-lobed.....*P. beddomei*
1b. Leaves oblong, acute; calyx 5-lobed *P. monophylla*

Paramignya beddomei Tanaka, J. Bot. 68: 230. 1930; Gamble, Fl. Pres. Madras 1872(1295). 1936; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 309. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 608. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 198. 2009. *Paramignya armata* Bedd., Ic. t. 275. 1868-1874; Hook. f., Fl. Brit. India 1: 511. 1875; Gamble, Fl. Pres. Madras 158(113). 1915, non (Thw.) Oliver 1861; Ramach. & V.J. Nair, Fl. Cannanore Dist. 85. 1988; Vajr., Fl. Palghat Dist. 106. 1990.

Woody climbers; spines axillary, retrorse; branchlets often zig-zag, densely puberulent; bark lenticelled and green. Leaves simple, alternate, 4-9.5 x 2-4.5 cm, ovate-lanceolate, acuminate at apex, obtuse at base, entire at margin, chartaceous, glabrous; lateral nerves 5-10 pairs, reticulate; petioles slender, 10-20 mm long, puberulent. Flowers axillary, solitary, rarely paired, ca 12 mm long; bacteoles 2, oblong, minute; pedicels slender, 15-17 mm long, glabrous. Calyx

cupular, 1.5-2 mm, glandular; lobes 5, auricled, ca 0.5 mm long, glabrous. Petals 5, oblong, glabrous, glandular and white. Stamens 10, subequal; filaments linear, 4-6 mm long, densely pubescent; anthers linear, obtuse, 5-6 mm long. Ovary subglobose, ca 2 x 1.5 mm, 5-lobed, glabrous, 5-loculed with 1 locule in each; style cylindrical, ca 6.5 mm long; stigma 5-lobed. Berries globose or pyriform, ca 2 cm, glandular, pinkish; seeds 3-5, compressed.

Ambalappara, *KVB 31576*

Fl. & Fr.: June-January

Distribution: Fairly common in Evergreen forests of Ambalappara and Pothurumi.

Paramignya monophylla Wight, Illustr. 1:109, t.42. 1840; Hook. f., Fl. Brit. India 1:510.1875; Gamble, Fl. Pres. Madras 158(113). 1915; Ansari, Fl. Kasaragod Div. 92. 1985; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4:312.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 608. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 198. 2009.

Climbing shrubs, branches with recurved axillary thorns. Leaves simple, alternate, 5-10 x 3-5 cm, ovate-oblong or elliptic, apex obtuse or acute, mucronate, base rounded, coriaceous, glabrous, lateral nerves and reticulation not prominent. Flowers 1-3, axillary. Calyx cupular, 5-lobed, pubescent. Petals white, narrowly oblong, imbricate. Stamens 10. Ovary densely pubescent, style puberulent. Berry subglobose or obovoid, 2-2.5 cm across, 3-5 grooved, yellow when ripe, downy-pubescent; seeds 3-5, flat.

Paripode, *KJD 26318*

Fl. & Fr.: October-March

Distribution: Fairly common in Semi-evergreen forests of Paripode and Kariyenkappu.

TODDALIA A.L. Jussieu, Gen. 371. 1789, *nom. cons.*

Toddalia asiatica (L.) Lam., Tabl. Encycl. 2: 116. 1797; Gamble, Fl. Pres. Madras 150(107). 1915; Manilal & Sivar., Fl. Calicut 59. 1982; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 403.1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 610. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 199. 2009. *Paullinia asiatica* L., Sp. Pl. 365. 1753. *Toddalia aculeata* (Smith) Pers., Syn. Pl. 1: 249. 1805; Hook. f., Fl. Brit. India 1: 497. 1875. *Toddalia floribunda* Wall., Pl. Asiat. Rar. 3: 17, t. 232. 1832. *Toddalia asiatica* (L.) Lam. *var. floribunda* (Wall.) Kurz, J. Asiat. Soc. Bengal pt.2, Nat. Hist. 44: 130. 1875; Gamble, Fl. Pres. Madras 151(107). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 85. 1988; Sunil & Sivadasan, Fl. Alappuzha Dist. 159. 2009. *Toddalia asiatica* (L.) Lam., Illustr. 2: 116. 1797, *var. obtusifolia* Gamble, Fl. Pres. Madras 151(107). 1915; Sasidh. & Sivar., Fl. Pl. Thrissur For. 85. 1996.

Toddalia asiatica (L.) Lam. *var. gracilis* Gamble, Fl. Pres. Madras 151(107). 1915; Sasidh., Fl. Chinnar WLS 57. 1999.

Stragglers, the stem scrambling by the sharp, recurved prickles. Leaves trifoliolate; leaflets sessile, 3-6 x 1.5-2.5 cm, ovate to oblong-lanceolate, apex obtuse or acute, base acute, margins shallowly crenulate, thin-coriaceous; petiole to 2.5 cm, often prickly beneath. Panicles axillary, to 5 cm long. Flowers c. 4 mm across. Sepals small, deltoid. Petals 3 x 1.5 cm, oblong, cream coloured, glandular. Stamens 3 mm long. Ovary in the pistillate flowers on a short gynophore. Fruit ca. 5 mm across, subglobose, apiculate, glandular, orange colour when ripe; seeds 3 or 4, subreniform.

Kattikari State Boundary, *KJD 26005*

Fl. & Fr.: February-July

Distribution: Fairly common in Evergreen forests of Kattikari and Meenmutty.

VEPRIS Commerson ex A. Jussieu, Mem. Mus. Hist. Nat. 12: 509. 1825.

Vepris bilocularis (Wight & Arn.) Engl. in Engl. & Prantl, Naturl. Pflanzenfam. 3(4): 178. 1896; Gamble, Fl. Pres. Madras 151(108). 1915; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 405. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 613. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 199. 2009. *Toddalia bilocularis* Wight & Arn., Prodr. 149. 1834; Hook. f., Fl. Brit. India 1: 497. 1875. *Dipetalum bioculare* (Wight & Arn.) Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 138. 1850.

Evergreen dioecious trees, to 25 m high, bark 4-6 mm thick, surface yellowish-grey, brittle. Leaves trifoliate, alternate, leaflets 7-25 x 3-10 cm, elliptic, oblong, elliptic-oblong or elliptic-obovate, apex acuminate, base acute, cuneate or rarely oblique, margin entire, revolute, glabrous, pellucid-gland dotted, coriaceous; rachis 2-10 cm long, slender, swollen at base, grooved above, glabrous, lateral nerves parallel, close, intramarginal nerve present, slender, prominent, intercostae reticulate, prominent. Flowers unisexual, 5-6 mm across, yellow, in axillary and terminal panicles; male flowers: calyx small, saucer-shaped, 2-3 lobed; petals 2-4, free, orbicular, glandular, glabrous, imbricate; stamens 6, inserted under the disc, exerted, equal; filaments broad at base; anthers ovate; pistillodes cylindric, 2-cleft above, glabrous; female flowers: sepals and petals as in male flowers; staminodes rudimentary; ovary superior, globose, 2-4-celled, ovules 2 in each cell; stigma capitate. Fruit a berry, globose, 2-celled, fleshy, glandular; seeds 2, planoconvex, brownish.

Paripode, *KJD 22547*

Fl. & Fr.: February-March

Distribution: Fairly common in Semi-evergreen forests of Paripode and Evergreen forests of Kannadivechakunnu. Endemic to southern Western Ghats, Conservation Status: Endangered.

ZANTHOXYLUM L., Sp. Pl. 270. 1753.

- 1a. Leaves 3-foliolate, shrubs.....*Z. ovalifolium*
1b. Leaves pinnate, leaflets 13-23, trees.....*Z. rhetsa*

Zanthoxylum ovalifolium Wight, Illustr. 1: 169. 1839; Hook. f., Fl. Brit. India 1: 492. 1875; Gamble, Fl. Pres. Madras 150(107). 1915; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 384. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 614. 2005.

Shrubs or straggaling shrubs, stem brownish, smooth; Leaves trifoliate, alternate, leaflets 8-12 x 3-4.5 cm, elliptic-obovate, apex abruptly acuminate, glabrous; nerves 15-18 pairs with an irregular intramarginal vein; petiole 5-10 cm long. Panicle to 5 x 2 cm, axillary, puberulus. Flowers few; male flowers 2-3 mm long; sepals 4, triangular; petals 2-3 mm long, white; stamens 4; female flowers 3-4 mm long; staminodes 4, filiform; pedicels 5 mm long. Capsule 6 mm across, globose, dark brown; seed 1, globose, shining.

Ambalappara, *NS & KVB 31340*

Fl. & Fr.: April-October

Distribution: Fairly common in Evergreen forests of Ambalappara.

Zanthoxylum rhetsa (Roxb.) DC., Prodr. 1: 728. 1824; Hook. f., Fl. Brit. India 1: 495. 1875; Gamble, Fl. Pres. Madras 150(107). 1925; Manilal & Sivar., Fl. Calicut 59. 1982; Ansari, Fl. Kasaragod Div. 93. 1985; K.N. Nair & M.P. Nayar in Hajra et al., Fl. India 4: 387. 1997; R.K. Premanath in P. Daniel, Fl. Kerala 1: 615. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 200. 2009. *Fagara rhetsa* Roxb., Fl. Ind. 1: 438. 1820. *Zanthoxylum limonella* (Dennst.)

Alston in Trimen, Handb. Fl. Ceyl. 6: 37. 1931. *Fagara budrunga* Roxb., Fl. Ind. 1:437.1820. *Zanthoxylum budrunga* (Roxb.) DC., Prodr. 1:728.1824; Hook. f., Fl. Brit. India 495.1875; Gamble, Fl. Pres. Madras 150(107). 1915.

Deciduous trees, to 20 m high, bark 15-20 mm thick, brown, mottled with white, armed with conical prickles; outer bark dead, corky, pale yellow, inner bark sulphur yellow; branchlets woody, terete, sparsely prickly. Leaves imparipinnate, alternate, clustered at the tips of branchlets, estipulate; leaflets 13-23, opposite or subopposite, 6-19 x 3-6.5 cm, oblong, elliptic-oblong, oblong-ovate, apex acuminate or caudate-acuminate, base oblique, margin entire or crenate, glabrous, punctate, coriaceous; petiolule 1-5 mm long; rachis 30-45 cm long slightly grooved above when young, becoming cylindrical on maturity, usually prickly, glabrous; lateral nerves 6-12 pairs, slender, pinnate, prominent; intercostae reticulate, faint. Flowers polygamous, greenish-yellow, 2-3 mm across, in terminal cymose panicles, peduncle and axis sometimes prickly; male flowers: sepals 4, ovate-triangular, fimbriate along margin, green; petals 4, free, elliptic-oblong, white or creamy yellow, valvate; stamens 4, anthers oblong, yellow; disc lobulate; pistillodes solitary; female flowers: sepals & petals as in male flowers; staminodes absent; disc pulvinate; ovary superior, 4-celled, ovules 2 in each cell; style eccentric; stigma truncate. Fruit a capsule, of 1-4 cocci, purplish, tubercled, aromatic; seeds globose, smooth, blue-black.

Crossway, *KJD 22555*

Fl. & Fr.: March-November

Distribution: Common in Evergreen forests of Cross way and Chavachi.

BURSERACEAE

CANARIUM L., Amoen. Acad. 4: 121. 1759.

Canarium strictum Roxb., Fl. Ind. 3: 138. 1832; Hook. f., Fl. Brit. India 1: 534. 1875; Gamble, Fl. Pres. Madras 172(123). 1915; V. Chithra & A.N. Henry in Hajra et al., Fl. India 4: 440. 1997; A.N. Henry & V. Chithra in P. Daniel, Fl. Kerala 1: 629. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 202. 2009.

Trees, to 30 m high, bole straight, buttressed; bark 4-7 mm thick, surface grey-brown or yellow, smooth, exfoliation small, irregular; blaze yellowish, aromatic; exudation brownish-black, resinous; branchlets velvety-tomentose. Leaves imparipinnate, alternate; stipules obscure; leaflets 7-11, opposite, 7-16 x 3.5-7 cm, ovate, ovate-lanceolate, oblong-ovate or elliptic-ovate, base acute or oblique, apex acuminate, margin serrulate or crenulate, glabrous above, rusty tomentose beneath, coriaceous; petiole 3-10 mm long, stout, tomentose; rachis 22-36 cm long, stout, tomentose, swollen at base; lateral nerves 10-20 pairs, parallel, prominent; intercostae scalariform, prominent. Flowers polygamous, 5-6 mm across, bright yellow; in large axillary panicles; bracts cauducous; male flowers; pedicels short; calyx tube campanulate, pubescent without, 5 mm; lobes 3, 1 mm; petals 3, oblong, concave, apiculate; disc annular, to 6 lobed, apically pilose; staminal tube to 3 mm; stamens 6, free from the disc; filaments 1 to 2 mm; anthers oblong, subequal; pistillode short; bisexual flowers: pedicels elongate; calyx urceolate, 4 mm, pubescent; lobes 3, valvate; petals 3, white, 1 cm long, oblong, pubescent without; disc obscurely lobed, pilose above; staminal tube to 3 mm; filaments 0.5 mm; anthers subequal; ovary superior, to 3.5 mm, 3-celled, ovules 1 in each cell;

style 1, stout; stigma capitate, 2-3 lobed. Fruit a drupe, 3.5 x 1.5 cm, ellipsoid, dark blue, 1-3-celled; seeds 1-3.

Chavachi, *KJD 18756*

Fl. & Fr.: January-December

Distribution: Fairly common in Evergreen forests of Chavachi and Chelachode.

MELIACEAE

- 1a. Petiole winged, herbs Naregamia
- 1b. Petiole not winged, trees or shrubs 2
- 2a. Ovary many ovules; seeds winged..... Toona
- 2b. Ovary 1 or 2 ovuled 3
- 3a. Leaves simple *Aglaia pp.*
- 3b. Leaves 3 or more foliolate 4
- 4a. Leaf margins serrate; fruit a drupe, less than 8mm across *Cipadessa*
- 4b. Leaf margins entire; fruit a capsule or berry, more than 1 cm across 5
- 5a. Petals 3..... *Aphanamixis*
- 5b. Petals 4 or 5 6
- 6a. Staminal tube oblong; fruits to 4 x 3 cm..... *Dysoxylum*
- 6b. Staminal tube globose; fruits less than 3 x 2.5 cm 7
- 7a. Anthers 4-7 *Aglaia pp.*
- 7b. Anthers 10... *Reinwardtiodendron*

AGLAIA Lour., Fl. Cochinch.173. 1790, *nom. cons.*

- 1a. Leaves simple *A. simplicifolia*
- 1b. Leaves 5 or more foliolate 2
- 2a. Sepals and petals 4 each *A. lawii*
- 2b. Sepals or calyx lobes and petals 5 each 3
- 3a. Fruit depressed globose, to 2.5 m broad *A. barberi*
- 3b. Fruit ellipsoid, less than 1.5 cm broad..... *A. elaeagnoidea*

Aglaia barberi Gamble, Bull. Misc. Inform. Kew 1915: 346. 1915 & Gamble, Fl. Pres. Madras 180(129). 1915; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 457.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 638. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 204. 2009.

Trees, to 15 m, bark reddish-brown, smooth; young parts covered with reddish-brown, lepidote scales. Leaves imparipinnate, alternate; leaflets 5-7, opposite or subopposite, 4.5-12 x 1.5-4 cm, elliptic-oblong, elliptic-lanceolate or lanceolate apex acuminate, base acute or obliquely acute, margin entire, coriaceous, glabrous above, reddish-brown scales present beneath; rachis 100-120 mm, slender, slightly swollen at base, covered with reddish-brown lepidote scales; lateral nerves 12-15 pairs, parallel, slender, obscure, intercostae obscure. Flowers polygamo-dioecious, yellow, in axillary panicles; peduncle densely scaly; bracts minute, cauducous. Calyx saucer shaped; lobes 5, acute, margin ciliate. Petals 5, orbicular, glabrous. Staminal tube 1 mm long, globose, not contracted at base, undulate along margins, anthers 5, included. Ovary superior, hairy, 1-2-celled; ovules 1-2 in each cell; style short; stigma capitate. Fruit a berry, depressed globose, brown puberulus, 2-3 cm across.

Amayikallu, *KVB 31566*

Fl. & Fr.: December-June

Distribution: Fairly common in Evergreen forests of Amayikallu and Chavachi. Endemic to Western Ghats, Conservation Status: Vulnerable.

Aglaia elaeagnoidea (A. Juss.) Benth., Fl. Austral. 1: 383. 1863; Manilal & Sivar., Fl. Calicut 63. 1982; Ansari, Fl. Kasaragod Div. 95. 1985; Pannell, Kew Bull. Add. ser. 16, 143.1992; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 461.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 641. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 206. 2009. *Nemedra elaeagnoidea* A. Juss., Mem. Mus. Hist. Nat. Paris 19: 259, t. 14. 1830. *Aglaia roxburghiana* (Wight & Arn.) Miq., Ann. Mus. Ludg.-Bat. 4: 41. 1868; Gamble, Fl. Pres. Madras 180(128). 1915. *Aglaia wallichii* Hiern in Hook. f., Fl. Brit. India 1: 555. 1875. *Aglaia roxburghiana* (Wight & Arn.) Miq. var. *obtusa* DC. in A. & C. DC., Monogr. Phan. 1: 605. 1878. *Aglaia roxburghiana* (Wight & Arn.) Miq. var. *beddomei* Gamble, Fl. Pres. Madras 180(129). 1915. *Aglaia roxburghiana* (Wight & Arn.) Miq. var. *courtallensis* Gamble, Fl. Pres. Madras 180(129). 1915. *Aglaia elaeagnoidea* (A. Juss.) Benth. var. *beddomei* (Gamble) K.K.N. Nair, Journ. Bombay Nat. Hist. Soc. 78: 426. 1981; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 462.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 640. 2005. *Aglaia elaeagnoidea* (A. Juss.) Benth. var. *courtallensis* (Gamble) K.K.N. Nair, Journ. Bombay Nat. Hist. Soc. 76: 476. 1981; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 465.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 641. 2005.

Trees, to 15 m high, bark reddish-brown, smooth; branchlets 3-4 mm thick, covered with brownish scales. Leaves imparipinnate, alternate, estipulate; leaflets 5-7, opposite, leaflets 6-10 x 3-4.5 cm, elliptic, elliptic-obovate, lanceolate or oblanceolate, apex acute, acuminate or caudate-acuminate, base oblique, acute or attenuate, margin entire, chartaceous, foveolate above, lepidote above and beneath; petiolule 10-18 mm long, lepidote scales present; rachis 60-80 mm long, stout, grooved above, swollen at base; lateral nerves 5-12 pairs, parallel, prominent, secondary laterals present, intercostae obscure. Flowers polygamodioecious, yellow, in axillary branching panicles. Calyx 5 lobed, campanulate, scaly, margins ciliate. Petals 5, free, imbricate. Staminal tube entire at apex; anthers 5, included. Ovary small, superior, slightly depressed, 1-2-celled, ovules 1-2 in each cell. Fruit a berry, globose, 1-15. cm across, buff coloured; seeds 1 or 2.

Vellachatamkunnu, *KJD 18723*

Fl. & Fr.: November-August

Distribution: Fairly common in Evergreen forests of Vellachatamkunnu.

Aglaia lawii (Wight) Saldanha in Saldanha & Nicolson, Fl. Hassan Dist. 392. 1976; Pannell, Kew Bull. Add. ser. 16, 97.1992; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 471.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 642. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 206. 2009. *Nimmonia lawii* Wight, Calcutta J. Nat. Hist. 7: 13. 1847. *Amoora lawii* (Wight) Bedd., Fl. Sylv. t. 133. 1871; Hook. f., Fl. Brit. India 1: 561. 1875; Gamble, Fl. Pres. Madras 181(130). 1915. *Aglaia andamanica* Hiern in Hook.f., Fl. Brit. India 1: 555. 1875. *Amoora canarana* (Turcz.) Hiern in Hook.f., Fl. Brit. India 1: 560.1875; Gamble, Fl. Pres. Madras 182(130). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 88. 1988; Manilal, Fl. Silent Valley 48. 1988. *Aglaia jainii* Viswan. & K. Ramach., Bull. Bot. Surv. India 24: 212. 1982(1983); S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 469.1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 642. 2005. *Aglaia tamilnadensis* N.C. Nair & Rajan in Nair & Henry, Fl. Tamil Nadu ser. 1, 1: 66. 1983.

Trees, to 15 m; bark 3-4 mm thick, surface brownish-grey, mottled with green, smooth, exfoliations thin, semi fibrous; young parts, inflorescence, calyx and fruits covered by yellowish-brown lepidote scales. Leaves imparipinnate, alternate, estipulate; leaflets 3-5, opposite or subopposite, 6-20 x 1.5-7 cm, asymmetrically broad ovate, elliptic-lanceolate or elliptic-obovate, apex acuminate, obtuse or obtusely acuminate, base obliquely acute or obtuse, margin entire, glabrous, densely scaly, coriaceous; petiolule 3-10 mm, stout or slender, covered with peltate scales, grooved above; rachis 3.2-20 cm long, slender or stout, swollen at base covered with yellowish-brown lepidote scales lateral nerves 7-18 pairs, pinnate, prominent, inter costae obscure; hairy gland like galls some times present in the axils of lateral veins. Flowers polygamo-dioecious, white; females and bisexuals in spikes; males in panicles or racemes, axillary; pedicels tetragonous, short; calyx truncate, short, 4 lobed; lobes obscure; petals 4, orbicular, long, subentire at apex, glabrous; stamens 8-10; staminal tube slightly crenate at mouth; anthers 8-10, attached near the base of staminal tube; ovary superior, lepidote, 3-locular, one ovule in each locule; stigma 3-lobed. Fruit a capsule, 1.5-2 cm long, obovoid, obtuse, yellow; seeds surrounded by a fleshy aril

Pothurumi, KVB 31728

Fl. & Fr.: December-February

Distribution: Fairly common in Evergreen forests of Pothurumi, Chavachi and Kattikari.

Aglaia simplicifolia (Bedd.) Harms in Engl. & Prantl, *Naturl. Pflanzenfam.* (ed. 2) 196. 1: 146. 1940; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 87. 1988; Pannell, *Kew Bull. Addl. ser.* 16, 306.1992; S.S. Jain & S.S.R. Bennet in Hajra et al., *Fl. India* 4: 474.1997; N.C. Nair & N.P. Balakr. in P. Daniel, *Fl. Kerala* 1: 645. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 207. 2009. *Beddomea simplicifolia* Bedd., *Fl. Sylv. t.* 135. 1871; Hook. f., *Fl. Brit. India* 1: 566. 1875; Gamble, *Fl. Pres. Madras* 184(132). 1915. *Beddomea simplicifolia var. parviflora* Bedd., *Fl. Sylv. t.* 135. 1871. *Beddomea simplicifolia var. racemosa* Bedd., *Fl. Sylv. t.* 135. 1871.

Small trees; twigs greyish-brown, usually with reddish-brown stellate hairs, sometimes with peltate scales, densely covering the apex only, sparse elsewhere. Leaves simple, alternate, 15-32 x 4.5-10 cm, acuminate or caudate at apex, cuneate at the slightly asymmetrical base, upper surface often shiny and minutely pitted, the lower surface usually with occasional stellate hairs or scales, that surface sometimes densely covered with hairs or scales; lateral nerves 11-18 pairs, ascending and markedly curved upwards near the margin, midrib, lateral veins and sometimes the reticulation subprominent on the upper surface; petiole up to 4 cm, with a swelling 0.5 cm long adjacent to the lamina. Inflorescence up to 15 cm long and 10 cm wide, peduncle up to 1 cm, rachis, branches and pedicels densely covered with stellate hairs like those on the twigs. Flowers subglobose, pedicel up to 2 mm. Calyx deeply divided into 5 subrotund lobes which are densely covered with stellate scales. Petals 5, yellow, obovate, aestivation quincuncial. Staminal tube nearly as long as the petals, obovoid, with a small aperture; anthers c. ½ the length of the tube, broadly ovoid, in the upper half of the tube, not or just protruding through the aperture. Ovary subglobose, densely covered with stellate scales; stigma ovoid, with two small apical lobes; ovary and stigma together c. 1/3 the length of the staminal tube. Fruits up to 4 cm long, obovoid or subglobose, brown, or pale yellow,

indehiscent, with a thick woody pericarp up to 5 mm thick and densely covered with stellate hairs on the outside; pericarp often longitudinally ridged. Loculi 1 or 2 (or sometimes 3, each containing 1 seed; aril transparent, gelatinous.

Kattikari, *KJD* 31500

Fl. & Fr.: November-June

Distribution: Fairly common in Evergreen forests of Kattikari.

APHANAMIXIS Blume, Bijdr. 165. 1825.

Aphanamixis polystachya (Wall.) Parker, Indian For. 57: 486. 1931; Manilal & Sivar., Fl. Calicut 63. 1982; Ansari, Fl. Kasaragod Div. 95. 1985; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 477. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 646. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 208. 2009. *Aglaia polystachya* Wall. in Roxb., Fl. Ind. 2: 429. 1824. *Andersonia rohituka* Roxb., Fl. Ind. 2: 213. 1832. *Amoora rohituka* (Roxb.) Wight & Arn. in Wight, Cat 24. 1833 & Prodr. 119. 1834; Hook. f., Fl. Brit. India 1: 559. 1875; Gamble, Fl. Pres. Madras 181(130). 1915. *Amoora beddomei* Kosterm., Acta Bot. Neerl. 31: 133. 1982; Kamble & Sharma, Journ. Econ. Tax. Bot. 5: 493. 1984.

Evergreen trees, to 20 m high, bark reddish-brown mottled with green; branchlets sericeous. Leaves imparipinnate, alternate, crowded at the end of branchlets, estipulate; leaflets 7-15, opposite, 4.5-25 x 2.5-6.5 cm, lowest pair smaller, ovate-oblong or oblanceolate, acute, apex acute or acuminate, base oblique, margin entire, undulate, coriaceous, glabrous above and glabrescent beneath; rachis 12-44.6 cm long, stout, pubescent, swollen at base, grooved above till the lowest leaf pairs, lateral nerves 7-13 pairs, pinnate, prominent; intercostae reticulate, prominent. Flowers polygamodioecious, white; panicles to 70 cm long, axillary, drooping; pedicel 2-6 mm long; sepals 5, orbicular, thick; petals 3, white, orbicular; staminal tube 4 mm long, globose; anthers 6, oblong, included; ovary superior, ovoid, pubescent, 3-celled, ovules 2 in each cell; stigma 3-lobed, subsessile. Fruit a capsule 2.5-3.5 x 3 cm, 3-lobed, glabrous yellow or purplish; seeds 2 or 3, oblong, with a scarlet aril.

Chavachi, *KJD* 18733

Fl. & Fr.: June-December

Distribution: Rare in Evergreen forests of Chavachi.

CIPADESSA Blume, Bijdr. 162. 1825.

Cipadessa baccifera (Roth) Miq., Ann. Mus. Lugd.-Bat. 4: 6. 1868; Gamble, Fl. Pres. Madras 176(126). 1915; Manilal & Sivar., Fl. Calicut 64. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 88. 1988; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 482. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 650. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 209. 2009. *Melia baccifera* Roth, Nov. Pl. Sp. 215. 1821. *Cipadessa fruticosa* Blume, Bijdr. 162. 1825; Hook. f., Fl. Brit. India 1: 545. 1875.

Shrubs to 3 m tall; branchlets tomentose. Leaves odd-pinnate; leaflets 3-5 pairs, opposite, 3-7 x 2-3.5 cm, narrowly oblong to ovate, apex acuminate, base acute or rounded, margins irregularly dentate towards apex; petiolule to 8 mm long. Panicles axillary, corymbose; peduncle to 7 cm long. Calyx-lobes c. 1 mm long, triangular, spreading, pubescent. Petals 3.5-4 mm long, ovate, cream or c. 3 mm long; stamens 10; anthers yellow. Ovary 5-6-angular, ovules 2 per cell; stigma turbinate. Drupe c. 5 mm across, globose, longitudinally grooved, reddish brown.

Fl. & Fr.: November-July

Distribution: Rare in Evergreen forests of Kannadivechakunnu.

DYSOXYLUM Blume, *Bijdr.* 4: 172. 1825.

Dysoxylum malabaricum Bedd. ex Hiern in Hook. f., *Fl. Brit. India* 1: 548. 1875; Gamble, *Fl. Pres. Madras* 178(128). 1915; S.S. Jain & S.S.R. Bennet in Hajra et al., *Fl. India* 4: 489. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, *Fl. Kerala* 1: 653. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 209. 2009.

Trees, to 35 m high, bark 5-8 mm thick, greyish-yellow, rough, verrucose; lenticels warty, fissured; aromatic, outer bark dead, corky. Leaves imparipinnate, alternate, estipulate; leaflets 7-11, opposite, subopposite or alternate, 9-23 x 3-5 cm, elliptic-oblong, ovate-oblong or lanceolate, apex acuminate, base oblique or acute, margin entire, puberulous when young, glabrous at maturity, coriaceous; rachis 17-28 cm long, stout, angular, swollen at base, pubescent; lateral nerves 6-20 pairs, parallel, ascending, prominent, intercostae reticulate, obscure, secondary laterals prominent. Flowers bisexual, greenish-yellow, fragrant, 5-6 mm long. Calyx deeply 4 lobed, lobes more or less obtuse. Petals 4, linear-oblong, subacute, pubescent outside, imbricate. Staminal tube urceolate, more or less 4-angled, with 8 deep emarginate crenatures; anthers 8, included; disc cup shape, entire, only just enclosing the ovary. Ovary superior, densely pubescent, 4-celled, ovules 2 in each cell; tapering into style; stigma capitate, 4-lobed. Fruit a capsule, 5-7.5 cm long, pyriform, verrucose, bright yellow, with 4 longitudinal furrows; seeds 3-4, reddish-brown, bluntly trigonus.

Chavachi, *KVB* 31559

Fl. & Fr.: February-June

Distribution: Fairly common in Evergreen forests of Chavachi, Chelachode and Crossway to Meenmutty. Endemic to southern Western Ghats.

NAREGAMIA Wight & Arnott, *Prodr.* 116. 1834, *nom. cons.*

Naregamia alata Wight & Arn., *Prodr.* 117. 1834; Hook. f., *Fl. Brit. India* 1: 542. 1875; Gamble, *Fl. Pres. Madras* 175(125). 1915; Manilal & Sivar., *Fl. Calicut* 64. 1982; Ansari, *Fl. Kasaragod Div.* 96. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 90. 1988; S.S. Jain & S.S.R. Bennet in Hajra et al., *Fl. India* 4: 498. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, *Fl. Kerala* 1: 657. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 211. 2009.

Prostrate woody herbs. Leaves 3-foliolate; leaflets 1.5-2.5 x 0.6-1.2 cm, obovate, laterals oblique, apex obtuse, base cuneate, margins entire to serrate; petioles 1.5-2.5 cm long, winged. Flowers axillary, solitary; pedicel short. Calyx 5-lobed; lobes 3-4 mm long, lanceolate. Petals 5, white, 1.5-1.8 cm long, spatulate. Disc annular. Staminal tube 1.8-2 cm long, cylindrical, inflated at top, white with 10 yellow teeth at margins; anthers 10, sessile at the apex of the tube. Ovary 3-celled; ovules 2 in each cell; style filiform; stigma capitate. Capsule 4-5 mm diam., ovoid to subglobose, 3-valved; seeds c. 1 mm across, curved, truncate at both ends.

Paripode, *KJD* 26259

Fl. & Fr.: August-December

Distribution: Rare along the boundaries of the Sanctuary.
Endemic to Peninsular India.

REINWARDTIODENDRON Koorders, Mede. Land. Plant. 19. 389. 1898.

Reinwardtiodendron anamalaiense (Bedd.) Mabb., Malaysian For. 45: 452. 1982; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 498. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 658. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 211. 2009. *Lansium anamalaiense* Bedd., Madras J. Lit. Sci. ser.3, 1: 40. 1864. *Lansium anamallayanum* Bedd., Fl. Sylv. t. 131. 1871 & Ic. t. 104. 1868-1874; Hook. f., Fl. Brit. India 1: 558. 1875; Gamble, Fl. Pres. Madras 182(130). 1915. *Aglaia anamallayana* (Bedd.) Kosterm., Reinwardtia 7: 257,t.10. 1966; Vajr., Fl. Palghat Dist. 109. 1990. *Reinwardtiodendron anamallayanum* (Bedd.) Saldanha in Saldanha & Nicolson, Fl. Hassan Dist. 392. 1976; Manilal, Fl. Silent Valley 50FCN 90; Sivar. & Mathew, Fl. Nilambur 135. 1997.

Trees, to 20 m high, bark 2-3 mm thick, smooth, greyish-brown mottled with grey, lenticellate; blaze dull yellow; branchlets minutely grey tomentose. Leaves imparipinnate, attenuate; leaflets 5-9, alternate, 5-15 x 1.5-5.5 cm, elliptic, lanceolate, elliptic-lanceolate or elliptic-obovate, acute, apex acuminate obtusely acuminate or caudate-acuminate, base oblique, attenuate or cuneate, margin entire, coriaceous, glabrous; rachis 4.2-11.5 cm long, slender, swollen at base, glabrous; lateral nerves 8-10 pairs, pinnate, slender, prominent, intercostae reticulate, prominent; domatia present. Flowers polygamodioecious, 3-4 mm across, yellowish-white; males in axillary panicles; females in axillary spikes or racemes. Sepals 5, ovate-orbicular, ciliate, fused in lower half. Petals 5, concave, imbricate; staminal tube globose, crenulate. Stamens 9-10 in 2 rows, the lower include, the upper partly exerted, sometimes apiculate, the attached filaments prominent. Ovary superior, globose, 5-celled, ovules 2 in each cell; style short, thick, stigma 3-5 lobed, truncate. Fruit a berry, ovoid, white, scaly; seeds 1-2, embedded in a pulpy aril.

Pothurumi, KVB 31735

Fl. & Fr.: March-November

Distribution: Common in Evergreen forests of Mullenpara and Pothurumi. Endemic to southern Western Ghats.

TOONA (Endlicher) M.J. Roemer, Fam. Nat. Syn. Monogr. 1: 131. 1846.

Toona ciliata Roem., Fam. Nat. Syn. Monogr. 139. 1846; Ramach. & V.J. Nair, Fl. Cannanore Dist. 90. 1988; S.S. Jain & S.S.R. Bennet in Hajra et al., Fl. India 4: 504. 1997; N.C. Nair & N.P. Balakr. in P. Daniel, Fl. Kerala 1: 663. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 212. 2009. *Cedrela toona* Roxb. ex Rottl. & Willd., Ges. Naturf. Freunde Berlin Neue Schriften 2: 198. 1803; Hook. f., Fl. Brit. India 1: 568. 1875; Gamble, Fl. Pres. Madras 186(133). 1915.

Semi-deciduous trees, to 30 m high, bark 10-15 mm thick, reddish-brown, rough, exfoliating in large flakes; fibrous. Leaves paripinnate, alternate, clustered at the tips of branchlets, estipulate; leaflets 12-30, opposite or subopposite 7-16 x 2-7 cm, ovate, ovate-lanceolate or oblong-lanceolate, apex acuminate, base oblique, margin entire or serrate, chartaceous, glossy above, pale beneath; rachis 13-90 cm long, slender, grooved above, glabrous, swollen at base; lateral nerves 10-15 pairs, pinnate, slender, prominent, intercostae reticulate, faint. Flowers bisexual, 8 mm across, white, in terminal or axillary drooping panicles; peduncle to 2 cm; pedicel to 2 mm long. Calyx cupular; lobes 5, ovate, tomentose, margin ciliate. Petals 5, white, 5 x 3 mm, oblong, spreading, ciliate, imbricate. Stamens 5, free, inserted on the top of disc; filaments subulate; anthers oblong, versatile; disc thick, 5-lobed, pubescent.

Ovary superior, ovoid, 2 mm long, pubescent, 5-celled, ovules 8-12 per cell, pendulous; style short, stigma discoid. Fruit a capsule, 1.8-3 x 1.5 cm, 5-valved; seeds many, oblong, thin, winged at both ends.

Meenmutty, KVB 31274

Fl. & Fr.: February-May

Distribution: Fairly common in Evergreen forests of Meenmutty.

DICHAPETALACEAE

DICHAPETALUM Dup. Thouars, Fam. Nat. Syn. Monogr. 1: 131. 1846.

Dichapetalum gelonioides (Roxb.) Engl. in Engl. & Prantl, Naturl. Pflanzenfam. 3(4): 348. 1896; Gamble, Fl. Pres. Madras 188(134). 1915; Ansari, Fl. Kasaragod Div. 97. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 92. 1988; N.C. Nair in Hajra et al., Fl. India 4: 528. 1997; N.C. Nair in P. Daniel, Fl. Kerala 1: 670. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 213. 2009. *Moacurra gelonioides* Roxb., Fl. Ind. 2: 69. 1832. *Chailletia gelonioides* (Roxb.) Bedd., For. Man. Bot. 59. Anal. Gen. t.9. f.1. 1871; Hook. f., Fl. Brit. India 1: 570. 1875.

Shrubs, branchlets hairy. Leaves alternate, 7-10 x 3-4 cm, elliptic, apex caudate-acuminate, base acute, entire. Flowers unisexual, in axillary or extra-axillary, short peduncled cymes, densely villous; bracts lanceolate. Sepals 5, 1.5 mm long, ovate. Petals 1.5 mm long, obovate, bilobed at apex, glabrous. Stamens 5, filaments short, anthers ovoid, disc 4 lobed, scale like. Ovary 3-celled, cell 2-ovuled, style 1, trifid above. Drupe 10 mm across, 2-lobed, compressed, rugose; seeds with orange-red aril.

Chelachode, KVB 31298; Chavachi, NS & KVB 31406

Fl. & Fr.: March-July

Distribution: Common under growth in Evergreen and Semi-evergreen forests.

OLACACEAE

STROMBOSIA Blume, Bijdr. 1154. 1826.

Strombosia ceylanica Gard., Calcutta J. Nat. Hist. 6: 350. 1846; Hook. f., Fl. Brit. India 1: 579. 1875; Gamble, Fl. Pres. Madras 191(137). 1915; Uniyal in N.P. Singh et al., Fl. India 5: 14. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 677. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 214. 2009.

Trees, to 25 m high, bark 3-4 mm thick, smooth, greenish-grey mottled with green, with shallow annular depression; blaze deep pink-red, lamellate with concentric lighter striations; branches drooping; branchlets glabrous. Leaves simple, alternate, estipulate, 8-18 x 3.5-6 cm, oblong-lanceolate, ovate-lanceolate, elliptic-oblong or lanceolate, apex acute or acuminate, base obtuse, acute or round, margin entire, coriaceous, glabrous, lower surface papillate, nerves 3 from the base; petiole 10-15 mm, stout, grooved above, glabrous; lateral nerves 4-6 pairs, pinnate, prominent, intercostae subscalariform, obscure. Flowers bisexual, 1.5-2 mm across, greenish-white, in axillary cymes; pedicels 1.5 mm long. Calyx 1 mm long, cupular, accrescent, 5-lobed. Petals 5, 2.5 x 1 mm, free, oblong, ovate, tomentose inside. Stamens 5, opposite the petals and adnate to them, anthers introrse. Ovary imperfectly 4-5-celled, surrounded by a lobed disc, ovules 4-5, pendulous; style short. Fruit a drupe

2.5 cm long, pyriform, deep purple rugose, surrounded by the remains of calyx lobes and style; stone crustaceous; seed one.

Ambalappara, KVB 31510

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests of Ambalappara.

ERYTHROPALACEAE

ERYTHROPLUM Blume, Civ. Nat. Hist. Jamaica 278. 1756.

Erythropalum scandens Blume, Bijdr. 922. 1826; Hook. f., Fl. Brit. India 1: 578. 1875; Uniyal in N.P. Singh et al., Fl. India 5: 5. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 674. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 218. 2009. *Mackaya populifolia* Arn., Jard. Mag. Zool. Bot. 2: 531. 1838. *Erythropalum populifolium* (Arn.) Mast. in Hook. f., Fl. Brit. India 1: 578. 1875; Gamble, Fl. Pres. Madras 191(137). 1915; Ramach. & V.J. Nair, Fl. Cannanore Dist. 92. 1988; Anil Kumar et al., Fl. Pathanamthitta 122. 2005.

Tendrillate climbers. Leaves alternate, 11-15 x 7-10 cm, ovate to deltoid, apex acuminate, base truncate; 3-ribbed, glaucous below, membranous. Flowers in axillary peduncled cymes, drooping, pedicellate. Sepals cupular, 5-toothed. Petals 5, 6 x 2 mm, oblong, obtuse, yellow. Stamens 5, filaments very short, staminodes hairy; disc surrounds the ovary. Ovary 1-celled, 1-3 ovuled, style short, stigma 3-fid. Fruit ovoid, 8 x 6 mm, orange-red, glabrous; seed 1, bluish-black, aril red.

Meenmutty, KVB 31524

Fl. & Fr.: December-March

Distribution: Common in Evergreen forests of Meenmutty, Kattikari and Chavachi.

ICACINACEAE

- 1a. Climbers 2
- 1b. Trees or shrubs 3
- 2a. Leaf margin dentate; inflorescens long peduncled heads..... Miquelia
- 2b. Leaves entire; inflorescens elongate spikes..... Sarcostigma
- 3a. Petals villous; flowers foul smelling..... Nothopodytes
- 3a. Petals glabrous; flowers not foul smelling... .. 4
- 4a. Large shrubs or small trees; flowers in axillary cymes, petals connate ... Gophandra
- 4b. Large trees; flowers in terminal corymbose cymes, petals free..... Apodytes

APODYTES E. Meyer ex Arnott, Hooker's J. Bot. 3: 155. 1840.

Apodytes dimidiata Meyer ex Arn. in Hook.'s J. Bot. 3: 155. 1840; R. Mathur in N.P. Singh et al., Fl. India 5: 18. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 683. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 214. 2009. *Apodytes benthamiana* Wight, Ic. t. 1153. 1846; Hook. f., Fl. Brit. India 1: 588. 1875; Gamble, Fl. Pres. Madras 195(140). 1915. *Apodytes beddomei* Mast. in Hook. f., Fl. Brit. India 1: 588. 1875; Gamble, Fl. Pres. Madras 195(140). 1915.

Trees, to 20 m high, bark 1.3 thick, greyish-black, rough, scaly, with short gaping fissures in corky larger, reddish-white beneath. Leaves simple, alternate, estipulate, 3.8-12.6 x 1.5-6 cm, ovate, elliptic-ovate, obovate,

obovate-oblong or oblong, apex acuminate, base acute, obtuse or oblique, margin entire or revolute, glabrous, membranous or coriaceous; petiole 8-26 mm long, slender, glabrous, grooved above; lateral nerves 4-9 pairs, slender, pinnate, prominent, intercostae reticulate, faint. Flowers bisexual, 5-8 mm long, white, in terminal or axillary corymbose cymes; pedicel short. Calyx small, 5 toothed, pubescent, persistent. Petals 5, free, oblong, acute, valvate, disc absent. Stamens 5, filaments dilated; anthers oblong, bipartite at base, medifixed, longer than filaments. Ovary superior, oblique, gibbous at base, 1-celled, ovules 2, pendulous, superposed; style slender, eccentric, stigma oblique. Fruit a drupe 15-18 x 10-12 mm, obliquely appendaged; stone crustaceous; seed one, pendulous.

Mullenpara, *KJD 18734*

Fl. & Fr.: April-October

Distribution: Rare in Evergreen forests of Mullenpara.

GOMPHANDRA Wallich ex Lindley, Nat. Syst. ed. 2, 439. 1876.

- 1a. Leaves coriaceous; cymes glabrous *G. coriacea*
1b. Leaves membranous; cymes puberulus..... *G. tetrandra*

Gomphandra coriacea Wight, Illustr. 1: 103. 1840; Gamble, Fl. Pres. Madras 195(140). 1915; R. Mathur in N.P. Singh et al., Fl. India 5: 22. 2000; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 215. 2009. *Gomphandra polymorpha* Wight, Illustr. 1: 103. 1840 p.p. & Ic. tt. 953,954. 1843; Hook. f., Fl. Brit. India 1: 586. 1875; Gamble, Fl. Pres. Madras 195(139). 1915.

Trees, to 7 m high, bark dark grey, smooth; blaze yellow; branchlets green. Leaves simple, alternate, estipulate, 3-12 x 1.8-5 cm, elliptic, obovate or elliptic-obovate, apex obtuse, obtusely acute, acute or acuminate, base acute, margin entire, coriaceous; petiole 5-15 mm long, slender, grooved above, glabrous; lateral nerves 3-7 pairs, pinnate, slender, faint, intercostae obscure. Flowers polygamo-dioecious, greenish-white, in leaf opposed cymes or rarely in axillary cymes. Calyx minute, cup-shaped; lobes 4-5. Corolla 4 mm long; lobes 4-5, acute, connate into a tube, lobes inflexed at apex; male flowers. Stamens 4-5, exserted, free; filaments thick, fleshy often connate, usually with a tuft of club-shaped hairs on the back at the apex; anthers pendulous from the interior apex of the filaments, dehiscing longitudinally; disc thick, annular or 0; pistillode pubescent; female flowers. Ovary superior, oblong, 1-celled, ovules 2; style conic; stigma small or discoid. Fruit a drupe, 15 x 8 mm, pale yellow, oblong-terete, crowned with the remains of persistent stigmas; endocarp wrinkled; seed pendulous, longitudinally surrounded by raphe.

Ambalappara, *KJD 22578*

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Ambalappara.

Gomphandra tetrandra (Wall.) Sleumer, Notizbl. Bot. Gart. Berlin-Dahlem. 15: 238. 1940 & Blumea 17: 204. 1969; Ansari, Fl. Kasaragod Div. 98. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 93. 1988; R. Mathur in N.P. Singh et al., Fl. India 5: 25. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 685. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 215. 2009. *Lasianthera tetrandra* Wall. in Roxb., Fl. Ind. 2: 238. 1824. *Gomphandra axillaris* Wall. ex Bedd., Fl. Sylv. t. 61. 1870; Hook. f., Fl. Brit. India 1: 586. 1875. *Gomphandra*

polymorpha Wight, Illustr. 1: 103. 1840 p.p.; Gamble, Fl. Pres. Madras 195(139). 1915.

Shrubs, branchlets yellowish green. Leaves simple, alternate, 9-16 x 3-5 cm, oblong, apex acuminate, base acute, nerves to 9 pairs. Cymes peduncled; peduncle 10 mm long. Flowers 3-10 together. Calyx 1 mm long, copular. Corolla 6 mm long, lobes cuspidate. Staminal filaments 8 mm long, connate. Drupe to 13 x 6 mm, obovate, acute. Drupe 1-1.3 cm long, obovate.

Moonamthode, NS & KVB 31393; Ambalappara, KVB 31720; Chavachi, KJD 31472, 26175

Fl. & Fr.: September-December

Distribution: Common under growth at Evergreen and Semi-evergreen Forests.

MIQUELIA C.F. Meissner, Pl. Vasc. Gen. 1: 152. 1838, *nom. cons.*

Miquelia dentata Bedd., Madras J. Lit. Sci. ser. 3, 1: 38. 1864; Hook. f., Fl. Brit. India 1: 593. 1875; Gamble, Fl. Pres. Madras 197(141). 1915; Ansari, Fl. Kasaragod Div. 98. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 93. 1988; R. Mathur in N.P. Singh et al., Fl. India 5: 29. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 686. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 216. 2009.

Glabrous climbers. Leaves simple, alternate, 16 x 7 cm, ovate, apex acute, base rounded or truncate, dentate, more sharply near the base; petiole 3-4 cm long. Flowers unisexual, in peduncled globose spike; peduncle to 6 cm long. Calyx cupular, 4-toothed. Petals 4, 3 mm long, oblong. Stamens 4 or 5, in male flowers. Ovary 1-celled, 4-angled, style absent, stigma 4-angled, ovules 2, pendulous. Drupe to 2 x 1 cm, 3-8 together, ovoid, sessile, yellow; seeds 1.5 x 1 cm, stalked, pitted.

Kariyenkappu, KJD 26122

Fl. & Fr.: April-September

Distribution: Rare in Semi-evergreen forests of Pothanplavu and plantations of Kariyenkappu. Endemic to southern Western Ghats, Conservation Status: Vulnerable.

NOTHAPODYTES Blume, Mus. Bot. Lugd.-Bat. 1: 248. 1850.

Nothapodytes nimmoniana (Graham) Mabb. in Manilal, Bot. Hist. Hort. Malab. 88. 1980; Manilal & Sivar., Fl. Calicut 65. 1982; Ansari, Fl. Kasaragod Div. 99. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 94. 1988; R. Mathur in N.P. Singh et al., Fl. India 5: 31. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 688. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 216. 2009. *Premna nimmoniana* Graham, Cat. Pl. Bombay 155. 1839. *Stemonurus foetidus* Wight, Ic. t. 955. 1845. *Mappia foetida* (Wight) Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 395. 1852; 1: 589. 1875; Gamble, Fl. Pres. Madras 196(141). 1915. *Nothapodytes foetida* (Wight) Sleumer, Notizbl. Bot. Gart. Berlin-Dahlem. 15: 247. 1940 & Blumea 17: 232. 1969. *Mappia wightiana* Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 397. 1852; Gamble, Fl. Pres. Madras 197(141). 1915. *Mappia tomentosa* Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 397. 1852; Hook. f., Fl. Brit. India 1: 589. 1875; Gamble, Fl. Pres. Madras 196(141). 1915. *Mappia ovata* Miers, Ann. Mag. Nat. Hist. ser. 2, 9: 396. 1852; Hook. f., Fl. Brit. India 1: 589. 1852; Gamble, Fl. Pres. Madras 197(141). 1915.

Trees, to 10 m high, bark yellowish, wrinkled; branchlets angled, appressed-hairy, corky, with prominent petiolar scars. Leaves simple, alternate, estipulate, 7-18 x 4-8 cm, broadly ovate, ovate-oblong or elliptic-

oblong, apex acuminate, base oblique, round or acute, margin entire, glabrous above, pubescent beneath, coriaceous; petiole 30-60 mm, stout, pubescent, grooved above; lateral nerves 6-10 pairs, pinnate, prominent, intercostae scalariform; domatia present. Flowers bisexual, creamy yellow, 5 mm across, in terminal pubescent corymbose cymes or panicles. Calyx cupular, 1 mm long, 5-toothed. Petals 5, 3 mm long, villous within, apically inflexed. Stamens 5, free; disc cupular; ovary ovoid, hairy, 1-celled, ovules 2; style angled; stigma stout. Fruit a drupe, 2 x 1 cm, ellipsoid, blackish-purple; seed glabrous.

Mullenpara, *KJD 26150*

Fl. & Fr.: June-September

Distribution: Rare in Evergreen forests of Mullenpara.

SARCOSTIGMA Wight & Arnott, Edinburgh New Philos. J. 14: 299. 1833.

Sarcostigma kleinii Wight & Arn., Edinb. New Phil. J. 14: 299. 1833; Hook. f., Fl. Brit. India 1: 594. 1875; Gamble, Fl. Pres. Madras 199(142). 1915; Manilal & Sivar., Fl. Calicut 65. 1982; Ansari, Fl. Kasaragod Div. 99. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 94. 1988; R. Mathur in N.P. Singh et al., Fl. India 5: 35. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 690. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 217. 2009.

Woody climbers, branchlets glabrous. Leaves simple, alternate, 17-22 x 8-12 cm, oblong-lanceolate, apex acuminate, base rounded or obtuse; lateral nerves 8 pairs, reticulate; petiole 5-12 cm long. Spikes to 35 cm long, slender, axillary or from tubercles. Flowers 3-6 together, yellow. Calyx cupular, 2 mm across, 5-toothed. Petals 3-5 mm long, oblong, recurved. Stamens 5, anthers versatile, staminodes 5. Female flowers mostly from old wood, ovary 1-celled, densely hairy; stigma sessile, discoid; pistillode in male flowers conical. Drupe to 3 x 1.5 cm, ovoid, orange-yellow, glabrous.

Kannadivechakunnu, *NS &KJD 25564*

Fl. & Fr.: February-July

Distribution: Fairly common in Evergreen forests of Kannadivechakunnu.

AQUIFOLIACEAE

ILEX L., Sp. Pl. 125. 1753.

Ilex wightiana Wall. ex Wight, Ic. t. 1216. 1848, **var. wightiana**; Hook. f., Fl. Brit. India 1: 603. 1875; Gamble, Fl. Pres. Madras 200(143). 1915; Swarup. et al., Shola For. Kerala 36. 1998; D. Basu in N.P. Singh et al., Fl. India 5: 73. 2000; M. Reema et al. in P. Daniel, Fl. Kerala 1: 695. 2005.

Trees to 15 m tall; branchlets glabrous. Leaves simple, alternate, elliptic, ovate, oblong or oblanceolate, acute to acuminate, mucronate-apiculate or rarely obtuse at apex, acute or rounded at base, subentire or serrulate at margin, glabrescent; lateral nerves distinct or not; petioles to 1.4 cm long. Inflorescences in umbellules; peduncles of male inflorescences 0.8-1.25 cm long; flowers 5-merous, 5-6 mm across. Calyx cupular, 1-2 x 2-2.5 mm; lobes 5 or 6, oblong-ovate, ovate or oblong, acute-apiculate, sometimes obtuse at apex, ciliate at margin, puberulous. Petals 5 or 6, connate below, white; tube ca 1 mm long; lobes oblong, oblong-obovate or ovate-elliptic, entire at margin, obtuse at apex, 2-2.5 x 1.5-2 mm. Stamens 5 or 6, shorter than petals, epipetalous; filaments ca. 1 mm long; anthers oblong, 0.8-0.9 mm long, dorsifixed; ovary rudimentary, puberulent; stigma 4-6 lobed. Female umbels

lax; peduncles ca 1.2 cm long; calyx and petals as in male flowers; ovary globose, ca 2 mm, 6-loculed; ovules 1 or 2 in each locule, pendulous; style ca 0.5 mm long; stigma capitate. Drupes globose, apiculate, smooth, dark red or blue; pyrenes 5 or 6, 3-gonous.

Asthippara, *KJD 31478*

Fl. & Fr.: February-August

Distribution: Rare in Evergreen forests of Asthippara.

CELASTRACEAE

- 1a. Trees or shrubs..... 2
- 1b. Climbers..... *Celastrus*
- 2a. Plants armed, branches zig-zag *Maytenus*
- 2b. Plants unarmed, branches not zig-zag 3
- 3a. Fruits one seeded, flowers sessile *Microtropis*
- 3b. Fruits more than one seeded, flowers pedicelled 4
- 4a. Flowers on many flowered dichasial cymes *Lophopetalum*
- 4b. Flowers on three flowered cymes 5
- 5a. Peduncles more than 10 cm, long..... *Glyptopetalum*
- 5b. Peduncles less than 3 cm..... *Euonymus*

CELASTRUS L., Sp. Pl. 196. 1753.

Celastrus paniculatus Willd., Sp. Pl. 1: 1125. 1797; Hook. f., Fl. Brit. India 1: 617. 1875; Gamble, Fl. Pres. Madras 208(150). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 95. 1988; K. Ramam. in N.P. Singh et al., Fl. India 5: 87. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 700. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 220. 2009.

Climbing shrubs; stem lenticellate. Leaves simple, alternate, 7-12 x 4-7 cm, broadly ovate, apex abruptly acuminate, base rounded or acute, crenulate; petiole 6 mm long. Panicle to 15 x 8 cm, terminal, axillary, oblong; pedicel 6 mm long; flowers many, 6 mm across. Sepals 5, small, imbricate, ciliate. Petals 2.5 x 2 mm, white, ovate, obtuse. Stamens 5, erect, anthers sagittate at base. Ovary 3-celled, cell 2-ovuled, stigma 3, recurved. Capsule to 1 cm across, loculicidal, yellow; seeds 3, aril reddish.

Chavachi, *KJD 26099*; Pothurumi, *NS & KVB 31410*

Fl. & Fr.: December-June

Distribution: Rare in Evergreen forests of Pothurumi and Chavachi.

EUONYMUS L., Sp. Pl. 197. 1753, *orth. cons.*

Euonymus indicus Heyne ex Roxb., Fl. Ind. 2: 409. 1824; Hook. f., Fl. Brit. India 1: 608. 1875; Gamble, Fl. Pres. Madras 202(146). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 95. 1988; K. Ramam. in N.P. Singh et al., Fl. India 5: 102. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 704. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 221. 2009. *Euonymus goughii* Wight, Ic. t. 215. 1839.

Trees, to 8 m high, bark greyish-brown to dark brown, rough; branchlets terete, yellow, twigs quadrangular. Leaves simple, opposite, decussate, 7-11 x 2-4 cm, elliptic, lanceolate, elliptic-lanceolate, oblong-lanceolate, apex acuminate, base cuneate or acute, margin entire, glabrous, shining above, coriaceous; stipules linear-subulate, cauducous; petiole 5-10 mm, slender, glabrous; lateral nerves 4-5 pairs, pinnate, slender, faint, intercostae reticulate, obscure. Flowers bisexual, yellowish-red, 1 cm across, in 1-3

flowered axillary cymes; peduncles to 3 cm, stout; pedicels to 6 mm, stout. Calyx deeply divided; lobes 5, to 1.5 mm long, fleshy, glabrous. Petals 5, 4 mm long, orbicular-oblong, fimbriate. Stamens 5, inserted on the disc near its margin; filaments short; anthers broad; disc thick, cupular, 5-lobed, fleshy. Ovary angular, sunk in the disc, 5-celled, ovules 2 per cell; style short, thick; stigma minutely lobed. Fruit a capsule, obovoid, 5-angled, orange-yellow, loculicidal, valves deeply obcordate; seeds reddish, oblong with red aril; albumen copious.

Ambalappara, *KVB 31650*; Pothurumi, *KVB 31663*

Fl. & Fr.: September-March

Distribution: Common in Evergreen Forests of Ambalappara.

Endemic to Western Ghats.

GLYPTOPETALUM Thwaites in Hook. Kew Journ. 8: t. 7B, 267. 1856.

Glyptopetalum grandiflorum Bedd., Ic. t. 102. 1868-1874; Hook. f., Fl. Brit. India 1: 613. 1875; Gamble, Fl. Pres. Madras 204(147). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 96. 1988; K. Ramam. in N.P. Singh et al., Fl. India 5: 111. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 705. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 222. 2009.

Shrubs; branchlets terete, angled when young. Leaves simple, opposite, 10-15.5 x 5-6.5 cm, elliptic-oblong, acute or acuminate at apex, rounded or cuneate at base, entire, rarely obscurely serrate towards apex, coriaceous. Cymes 3-flowered; peduncles filiform, slender, 10-16 cm long; pedicels ca 2.5 cm long, inserted with scale-like bracts. Sepals 4-lobed. Petals 4, obovate, 8-10 mm long, inconspicuously pitted or not, yellow. Stamens 4, sessile. Disc more or less rounded. Ovary within disc. Capsules globose, ca 2 cm, smooth, pale, 4-seeded; seeds ovate, 1.5 cm across, arillate.

Kannadivechakunnu, *NS &KJD 25568*

Fl. & Fr.: February-October

Distribution: Rare in Evergreen forests of Kannadivechakunnu. Endemic to southern Western Ghats.

LOPHOPETALUM Wight ex Arnott, Ann. Nat. Hist. 3: 150. 1839.

Lophopetalum wightianum Arn., Ann. Nat. Hist. 3: 151. 1839; Hook. f., Fl. Brit. India 1: 615. 1875; Gamble, Fl. Pres. Madras 205(147). 1918; Ansari, Fl. Kasaragod Div. 100. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 96. 1988; K. Ramam. in N.P. Singh et al., Fl. India 5: 116. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 709. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 222. 2009.

Evergreen trees, to 30 m high, bole buttressed; bark yellowish-brown, mottled with white, smooth, brittle; branchlets terete, brown. Leaves simple, opposite or subopposite, estipulate, 7.5-25 x 3.7-10 cm, elliptic, elliptic-oblong, oblong, ovate or ovate-oblong, apex obtuse or acute, base obtuse or round, margin entire, coriaceous, glabrous; petiole 10-25 mm long, stout, grooved above, glabrous; lateral nerves 6-12 pairs, pinnate, arched towards the margin, prominent, intercostae reticulate, slender, prominent. Flowers bisexual, 15-18 mm across, pinkish to dull red, in lax axillary or terminal dichasial cymes. Calyx broadly flattened at base, 0.5-0.6 cm across; lobes 5, broad, obtuse, very short. Petals 5, 0.5-0.6 cm long, continuous with the disc, orbicular, uneven, clawed, crispate above, persistent, spreading; disc large, flat, 5 lobed. Stamens 5, inserted on the disc; filaments subulate; anthers

oblong. Ovary small, immersed in the disc and continuous with it, triquetrous, 3-celled, ovules 4 or more in each cell; style short, stigma capitate. Fruit a capsule 8-10 x 2.5-3.5 cm, 3-angled, trigonous, 3 valved, brown, smooth, pointed at both ends, loculicidal; seeds thin, surrounded by long linear wing, 5 x 1.2 cm, brown, compressed, arillate.

Chavachi, KVB 31602

Fl. & Fr.: December-July

Distribution: Common along Riverbanks at Chavachi, Kariyenkappu, Valayamchal and Narikkadavu.

Maytenus Molina, Sag. Stor. Nat. Chili 177. 1782.

Maytenus wallichii (G. Don) Bennet & Sahni, Indian For. 103: 387. 1977; K. Ramam. in N.P. Singh et al., Fl. India 5: 128. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 711. 2005. *Catha wallichii* G. Don, Gen. Hist. 2: 10. 1832. *Gymnosporia wallichiana* Spreng. ex Wight & Arn., Prodr. 159. 1834; Hook. f., Fl. Brit. India 1: 621. 1875.

Shrubs; branchlets zig-zag, terete, thorny. Leaves simple, alternate, 2.5-4 x 2-3 cm, obovate, obtuse or emarginate at apex, cuneate at base, coriaceous and glabrous; nerves distinct, reticulate. Flowers in cymes or fascicles, axillary or on spines. Sepals 5, 3-angled. Petals 5, oblong, thin. Stamens 5, interpetaloid, inserted below disc. Disc rounded and fleshy. Ovary within the disc; stigmas capitate. Fruits capsular, slightly obcordate, ca 12 mm long, 3-loculed, 6-seeded; seeds flat, arillate; aril attached only to the base of seed.

Ambalappara, KVB 31644

Fl. & Fr.: Through out the Year

Distribution: Common in Evergreen forests of Ambalappara.

MICROTROPIS Wallich ex Meissner, Gen. 1: 68. 1837, *nom cons.*

4a. Leaf apex acute to acuminate, margins not reflexed *M. stocksii*

4b. Leaf apex obtuse, margins thickened *M. latifolia*

Microtropis latifolia Wight ex Lawson in Hook.f., Fl. Brit. India 1: 615. 1875; Gamble, Fl. Pres. Madras 205(148). 1918; K. Ramam. in N.P. Singh et al., Fl. India 5: 130. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 713. 2005.

Small trees. Leaves simple, subopposite, 7-15 x 2.5-6.5 cm, ovate-elliptic to oblong-lanceolate, x acuminate at apex, 7-15 x 2.5-6.5 cm, coriaceous, glabrous, rugulose above; lateral nerves obscure on both surfaces; petioles 6-7 mm long. Flowers sessile, clustered in axils of fallen leaves or solitary, yellowish white. Calyx 5-lobed, membranous at margin above, rugose outside. Petals obovate-cuneate, connate at base forming a ring. Stamens inserted at ring; filaments short. Ovary flask-shaped, furrowed. Capsules ellipsoid, narrow at base, 1.5-2 cm long, 1-seeded; seed oblong, rugose.

Chelachode, KVB 31686

Fl. & Fr.: October-April

Distribution: Common in Evergreen forests of Chelachode, Moonamthode and Kattikari. Endemic to southern Western Ghats.

Microtropis stocksii Gamble, Bull. Misc. Inform. Kew 1916: 132. 1916 & Gamble, Fl. Pres. Madras 206(148). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 96. 1988; K. Ramam. in N.P. Singh et al., Fl. India 5: 131. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 714. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 223. 2009.

Large shrubs; branchlets reddish-brown. Leaves simple, opposite, 7-10 x 3-5 cm, elliptic, apex obtusely acuminate, margins folding, green or yellow when dried; petiole to 8 mm long, yellow. Flowers 3 mm across, few in axillary clusters. Sepals ovate, obtuse. Petals 2 x 1 mm, ovate, obtuse, white, glabrous. Capsule to 13 x 8 mm, brown, aril red.

Ambalappara, KVB 31705

Fl. & Fr.: February-July

Distribution: Common in Evergreen forests of Kattikari and rare in Evergreen forests of Ambalappara. Endemic to Western Ghats.

HIPPOCRATEACEAE

- 1a. Fruit a follicle; seeds winged Reissantia
 1b. Fruit a berry, seeds not winged Salacia

REISSANTIA Halle, Bull. Mus. Hist. Nat. (Paris) Ser. 2, 30: 466. 1958.

Reissantia indica (Willd.) Halle, Mem. Inst. Franc. Afrique Noire 64: 85. 1962; Manilal & Sivar., Fl. Calicut 66. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 97. 1988; K. Ramam. & B.D. Naithani in N.P. Singh et al., Fl. India 5: 149. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 717. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 224. 2009. *Hippocratea indica* Willd., Sp. Pl. 1: 193. 1797; Hook. f., Fl. Brit. India 1: 625. 1875; Gamble, Fl. Pres. Madras 213(153). 1918.

Woody climbers with looping branchlets. Leaves simple, opposite, 12 x 7 cm, obovate, obtusely acute, attenuate to the base; nerves 4 or 5 pairs, ascending; petiole 1 cm long. Flowers in axillary drooping panicles, pedicellate. Sepals 5, ovate, acute, glabrous. Petals 5, 3 x 1 mm, oblong, curved, glabrous. Stamens 3, filaments short curved out. Ovary 3-celled, sunken in the disk; ovules 2-10 in each cell. Fruit a winged samara.

Pothanplavu, KJD 26027

Fl. & Fr.: November-April

Distribution: Rare in Semi-evergreen forests of Pothanplavu.

SALACIA L., Mant. 159. 1771, *nom. cons.*

- 1a. Flowers clustered in tubercles on branchlets 2
 1b. Flowers in short cymes; leaf apex obtusely acuminate..... S. fruticosa
 2a. Pedicels 3-5 mm long, fruit surface rugose S. malabarica
 2b. Flowers sessile or subsessile S. oblonga

Salacia fruticosa Heyne ex Lawson in Hook. f., Fl. Brit. India 1: 628. 1875; Gamble, Fl. Pres. Madras 215(155). 1918; Manilal & Sivar., Fl. Calicut 66. 1982; Ansari, Fl. Kasaragod Div. 101. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 98. 1988; K. Ramam. & B.D. Naithani in N.P. Singh et al., Fl. India 5: 153. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 720. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 225. 2009.

Woody climbing shrubs; branchlets looped; young shoots puberulous. Leaves simple, opposite, 3.8-7 x 2-4 cm, elliptic-ovate or elliptic-oblong, apex obtusely acuminate, base rounded or cuneate, coriaceous; petiole c. 5 mm long. Cymes axillary; pedicels 3-5 mm long. Calyx 5-lobed, minute; lobes minutely ciliate on margins. Petals 5, brownish-yellow, c. 2 mm across, orbicular. Disc fleshy. Stamens 3, inserted on the inner margin of the disc; filaments broad, curved. Ovary globose, minute, partially sunk in the disc, 3-

celled; ovules 2-8 in each cell; style very short; stigma capitate, obscurely 3-lobed. Berry 2-2.5 cm across, globose, red; seeds 1-3.

Chavachi, NS & KVB 31405

Fl. & Fr.: January-August

Distribution: Fairly common in Evergreen forests of Chavachi and Kanadevechakunnu. Endemic to Western Ghats.

Salacia malabarica Gamble, Bull. Misc. Inform. Kew 1916: 133. 1916 & Gamble, Fl. Pres. Madras 215(154). 1918; K. Ramam. & B.D. Naithani in N.P. Singh et al., Fl. India 5: 158. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 721. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 226. 2009.

Scandent shrubs; branchlets faintly muriculate. Leaves simple, opposite, 9-13 x 4.5-7 cm, elliptic-oblong, apex acuminate, base cuneate or rounded, coriaceous. Flowers in axillary fascicles; pedicel 2-3 cm long. Petals greenish yellow, elliptic. Berry hard, globose, c. 5 cm diam.

Chavachi, KJD 22502

Fl. & Fr.: February-April

Distribution: Rare in Evergreen forests of Chavachi. Endemic to Southern Western Ghats; Conservation status: Vulnerable.

Salacia oblonga Wall. ex Wight & Arn., Prodr. 106.1834; Hook. f., Fl. Brit. India 1:628.1875; Gamble, Fl. Pres. Madras 215(155). 1918; K. Ramam. & B.D. Naithani in N.P. Singh et al., Fl. India 5: 160. 2000; K. Ramam. & P. Venu in P. Daniel, Fl. Kerala 1: 721. 2005.

Stout climbers, branchlets densely lenticellate, lenticels elongate. Leaves simple, opposite to subopposite, 21 x 8 cm, oblong, acute or obtuse at apex, acute at base, green when dry; nerves 8-10 pairs; petiole 1 cm long. Peduncle short, stout, many-flowered. Flowers many, greenish yellow. Sepals 1.5 mm across, orbicular. Petals 2.5 mm long, ovate. Berry ca. 4 cm across, orange-red, smooth.

Mullenpara, KVB 31593

Fl. & Fr.: February-May

Distribution: Rare in Evergreen forests of Mullenpara.

RHAMNACEAE

- 1a. Plants armed with stipular spines Ziziphus
1b. Plants unarmed 2
2a. Tendrils present; leaf base equal; fruit with 3 short wings Gouania
2b. Tendrils absent; leaf base unequal; fruit with one elongate wing..... Symthea

GOUANIA N.J. Jacquin, Sel. Strip. Amer. Hist. 263. 1763.

Gouania microcarpa DC., Prodr. 2: 40. 1825; Hook. f., Fl. Brit. India 1: 643. 1875; Gamble, Fl. Pres. Madras 225(161). 1918; Ansari, Fl. Kasaragod Div. 101. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 99. 1988; Bhandari & Bhansali in N.P. Singh et al., Fl. India 5: 176. 2000; P.V. Sreekumar & A.N. Henry in P. Daniel, Fl. Kerala 1: 725. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 227. 2009.

Large tendrillate climbers; branchlets tomentose. Leaves simple, alternate, 10-15 x 5 cm, ovate, acuminate, rounded or cordate at base, fulvous hairy below; nerves 5 pairs, prominent, regular. Inflorescence a terminal panicle, to 25 x 20 cm, tomentose. Flowers 4 mm across, 3-6 together; pedicels 1.5 mm long. Sepals 5, 1.5 x 1.5 mm, triangular, densely hairy. Petals 1.5 x 1 mm, obovate, curved, concave. Stamens 5, free, filaments 1 mm long. Ovary 3-celled, hairy; ovules one in each cell; style short; stigma capitate. Capsule 7 x

10 mm, 3-winged, yellowish, septicial; seeds 3, 2.5 x 2.5 mm, obovoid, compressed, dark-brown.

Kattikari, *KJD 26387*

Fl. & Fr.: October-March

Distribution: Rare in Evergreen forests of Kattikari.

SMYTHEA Seem., *Bonplandia* 9: 255. 1861.

Smythea bombaiensis (Dalz.) Banerjee & P.K. Mukh., *Indian For.* 96:214.1970; Bhandari & Bhansali in N.P. Singh et al., *Fl. India* 5: 210. 2000; Anil Kumar et al., *Fl. Pathanamthitta* 130. 2005. *Ventilago bombaiensis* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 3: 36. 1851; Hook. f., *Fl. Brit. India* 1: 631. 1875; Gamble, *Fl. Pres. Madras* 217(157). 1918; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 99. 1988; P.V. Sreekumar & A.N. Henry in P. Daniel, *Fl. Kerala* 1: 729. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 227. 2009.

Woody climbers, stem ribbed, branchlets looping. Leaves simple, alternate, 6-9 x 3-4 cm, elliptic-oblong, acute at both ends, crenulate; nerves 6 pairs, nerve-axils hairy, nervules parallel. Flowers 4 mm across, 20-30 together, in axillary clusters; pedicels to 5 mm long. Sepals 5, triangular. Petals 5, obovate, emarginate to 2-lobed, glabrous. Stamens 5, disk cup-shaped. Ovary 2-celled, densely hairy. Fruit 1-seeded, winged, wing to 6 x 1.5 cm, flattened.

Mullenpara, *KJD 22519*

Fl. & Fr.: February-June

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to Western Ghats.

ZIZIPHUS P. Miller, *Gard. Dict.* ed. 4. 1754.

2a. Flowers in paniculate cymes; petals absent.....*Z. rugosa*

2b. Flowers in condensed cymes; petals present.....3

3a. Styles 2; drupe to 0.8 cm diameter.....*Z. oenoplia*

3b. Styles 3; drupe more than 1.2 cm diameter..... *Z. xylopyrus*

Ziziphus oenoplia (L.) Mill., *Gard. Dict.* (ed. 8). 3.1768; Hook. f., *Fl. Brit. India* 1:634.1875; Gamble, *Fl. Pres. Madras* 220(158).1918; Manilal & Sivar., *Fl. Calicut* 67. 1982; Ansari, *Fl. Kasaragod Div.* 102. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 101. 1988; Bhandari & Bhansali in N.P. Singh et al., *Fl. India* 5: 238. 2000; P.V. Sreekumar & A.N. Henry in P. Daniel, *Fl. Kerala* 1: 734. 2005; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 229. 2009. *Rhamnus oenoplia* L., *Sp. Pl.* 194. 1753.

Scandent shrubs, thorns many, recurved, branchlets densely silky hairy. Leaves simple, alternate, 4-6.5 x 2-3 cm, ovate, apex acuminate, base oblique, 3 or 4 ribbed, densely fulvous hairy, sessile or shortly petioled. Flowers 3 mm across, shortly pedicelled, 6-20 in axillary clusters. Sepals triangular, hispid outside. Petals clawed, concave, greenish yellow; disk flat, glabrous. Drupe 6 x 6 mm, globose, black.

Valayamchal, *KJD 22557*

Fl. & Fr.: November-March

Distribution: Along the boundaries of Moist deciduous forests.

Ziziphus rugosa Lam., *Encycl.* 3: 319. 1789; Hook. f., *Fl. Brit. India* 1: 636. 1875; Gamble, *Fl. Pres. Madras* 221(158). 1918; Manilal & Sivar., *Fl. Calicut* 67. 1982; Ansari, *Fl. Kasaragod Div.* 102. 1985; Ramach. & V.J. Nair, *Fl.*

Cannanore Dist. 101. 1988; Bhandari & Bhansali in N.P. Singh et al., Fl. India 5: 241. 2000; P.V. Sreekumar & A.N. Henry in P. Daniel, Fl. Kerala 1: 734. 2005.

Scandent shrubs, thorns, recurved. Leaves simple, alternate, 9-12 x 4-7 cm, ovate-orbicular, apex acute, base unequally cordate, fulvous-tomentose beneath, coriaceous, crenulate; petiole to 1 cm long. Flowers 6-20 together; subsessile, 5 mm across; sepals densely tomentose outside; disk flat, glabrous; ovary densely tomentose, 2-celled; styles 2, curved. Drupe to 1.3 cm, globose, white, glabrous.

Paripode, *KJD 22511*

Fl. & Fr.: November-May

Distribution: Rare along the Forest boundaries at Paripode, near Farm.

Ziziphus xylopyrus (Retz.) Willd., Sp. Pl. 1: 1104. 1798; Hook. f., Fl. Brit. India 1: 636. 1875; Gamble, Fl. Pres. Madras 221(158). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 101. 1988; Bhandari & Bhansali in N.P. Singh et al., Fl. India 5: 243. 2000; P.V. Sreekumar & A.N. Henry in P. Daniel, Fl. Kerala 1: 735. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 230. 2009. *Rhamnus xylopyrus* Retz., Obs. Bot. 2: 11. 1781.

Trees, to 12 m high, bark thin, brownish-grey, exfoliating in small scales; branchlets tomentose, sparsely armed. Leaves simple, alternate, 5-8 x 3-5 cm, ovate-oblong or suborbicular, apex obtuse, apiculate, base rounded, margin serrulate, glabrous above, tomentose beneath, coriaceous, 3-5-ribbed from base; petiole 5-12 mm, tomentose, slender; lateral nerves many, puberulent beneath, intercostae reticulate, faint; stipulate. Flowers bisexual, in axillary cymes, greenish-yellow, pubescent; peduncle 1.5 cm long. Calyx 5 lobed, 1.5 mm radiating. Petals 5, 2 mm, spatulate; disc 5 lobed. Stamens 5, filaments subulate. Ovary 3-celled, ovules solitary; styles 3; stigma trifid. Fruit a drupe, 1.5-2.5 cm across, globose, woody; seeds 3.

Near Farm, Valayamchal, *KJD 22579*

Fl. & Fr.: May-June

Distribution: Rare along forest boundaries near Farm.

VITACEAE

- 1a. Flowers polygamous 2
- 1b. Flowers hermaphrodite..... 3
- 2a. Leaves simple, peduncle with tendrils..... Ampelocissus
- 2b. Leaves trifoliate, peduncles without tendrils Tetrastigma
- 3a. Berry one seeded, leaves simple Cissus
- 3b. Berry 2-4 seeded, leaves 1-5 foliate..... Cayratia

AMPELOCISSUS Planch., Vigne Amer. Vitic. Eur. 8: 371. 1884, *nom. cons.*

Ampelocissus indica (L.) Planch., Vigne Amer. Vitic. Eur. 8: 375. 1884; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 254. 2000 & in P. Daniel, Fl. Kerala 1: 738. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 231. 2009. *Vitis indica* L., Sp. Pl. 202. 1753; Hook. f., Fl. Brit. India 1: 653. 1875. *Ampelocissus arnottiana* Planch. in A. & C. DC., Monogr. Phan. 5: 379. 1887; Gamble, Fl. Pres. Madras 231(165). 1918; Manilal & Sivar., Fl. Calicut 68. 1982; M. Mohanan & Henry, Fl. Thiruvanthapuram 119. 1994.

Scandent shrubs; branches striate, ferruginous-wooly. Leaves simple, alternate, broadly ovate, sometimes angled, acuminate at apex, cordate at base, dentate-serrate at margin with teeth hardened at tip, coriaceous, glabrescent above, ferruginous-hairy beneath; petioles 2-8 cm long.

Inflorescences dense racemes of umbels; primary branch ca 1 cm long; racemes 3-5 x ca 1 cm; peduncles to 5 cm long; tendrils simple, ca 10 cm long. Flowers reddish brown; pedicels ca 2 mm long. Calyx saucer-like, entire, glabrous. Petals oblong-ovate, ca 2 mm long, glabrous. Disc elongate, covering most of ovary, 5-furrowed. Berries globose; seeds suborbicular in outline, mucronate at base, ca 7 x 5.5 mm, with a longitudinal ridge and a broad groove on either side on adaxial surface and an elliptic chalazal knot and very fine fissures radiating towards margin on abaxial surface.

Kariyenkappu, *KJD 18731*

Fl. & Fr.: March-September

Distribution: Fairly common in plantations of Kariyenkappu near stream side.

CAYRATIA A. Juss., Dict. Sci. Nat.10: 103. 1818, *nom. cons.*

- 1a. Section of seed-albumen crescent shaped 2
- 1b. Section of seed-albumen t-shaped *C. sp.*
- 2a. Fruit nearly 1.5 cm diameter, plant softly villous *C. mollissima*
- 2b. Fruit less than 1 cm diameter, plant softly pubescent *C. pedata* var. *pedata*

Cayratia mollissima (Wall.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 345. 1911; Gamble, Fl. Pres. Madras 237(169). 1918; Ansari, Fl. Kasaragod Div. 104. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 103. 1988; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 270. 2000 & in P. Daniel, Fl. Kerala 1: 743. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 232. 2009. *Vitis mollissima* Wall. in Roxb., Fl. Ind. 2: 482. 1824; Hook. f., Fl. Brit. India 1: 656. 1875.

Weak climbers; stem scabrous. Leaves trifoliate, leaflets 3, 8-12 x 4-7 cm, ovate, acuminate at apex, acute at base, distantly spineous-serrate; nerves 4 or 5 pairs, glabrous; petiole 4 cm long. Peduncle 1.5 cm long, extra-axillary, trichotomous cymes 2 x 3 cm. Flowers greenish-yellow. Calyx a membranous cup, 2 mm across, entire. Petals 2 x 1 mm, oblong. Berry 6 mm across, obovoid, glabrous; seeds pitted on sides

Kattikari, *KJD 26030*

Fl. & Fr.: June-December

Distribution: Rare in Evergreen forests of Kattikari.

Cayratia pedata (Lam.) A. Juss. ex Gagnep. in Lecomte, Notul. Syst. (Paris) 1: 346. 1911 var. **pedata**; Gamble, Fl. Pres. Madras 236(169). 1915; Manilal & Sivar., Fl. Calicut 69. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 103. 1988; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 272. 2000 & in P. Daniel, Fl. Kerala 1: 744. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 233. 2009. *Cissus pedata* Lam., Encycl. 1: 31. 1783. *Vitis pedata* (Lam.) Wall. ex Wight & Arn., Prodr. 128. 1834; Hook. f., Fl. Brit. India 1: 661. 1875. *Vitis canarensis* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 123. 1851.

Weak climbers; stem minutely hispid. Leaves pedately 5-9-foliolate; leaflets 7-15 x 3-6 cm, ovate, acuminate, serrate, hispid; nerves 8-10 pairs, regular, prominent; rachis 9 cm long; petiolule 1 cm long, of terminal leaflet 3.5 cm long. Cymes 7 x 8 cm, hispid; peduncle 3 cm long. Flowers 6 mm across, greenish. Petals 3 x 2 mm, ovate, acute; disk a fleshy rim. Berry 1 x 1 cm, 2-4 lobed, rusty tomentose; seed 6 x 6 mm, faces rugose.

Pothurumi, *NS &KVB 31419*

Fl. & Fr.: June-July

Distribution: Fairly common in Evergreen forests of Pothurumi and Semi-evergreen forests of Narikkadavu and Paripode.

Cayratia sp.

Woody climbers; stem scabrous. Leaflets 3, ovate, acuminate at apex, acute at base, distantly serrate; nerves 8-11 pairs, glabrous; petiole more than 4 cm long. Peduncle 1.5 cm long. Berry 10-15 mm across, obovoid, glabrous; seeds 1-4, albumen t-shaped.

Chavachi, *KJD 26106*

Fl. & Fr.: March-May

Distribution: Rare in Evergreen forests of Chavachi

CISSUS L., Sp. Pl. 117. 1753.

- 1a. Stem 4-winged.....*C. glyptocarpa*
- 1b. Stem terete or angular 2
- 2a. Branchlets 5 or 6 angled, under surface of leaf reddish.....*C. discolor*
- 2b. Branchletes terete , under surface of leaf greenish *C. repens*

Cissus discolor Blume, Cat. Gew. Buitenz. 39. 1823; Gamble, Fl. Pres. Madras 235(168). 1918; Ansari, Fl. Kasaragod Div. 105. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 104. 1988; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 282. 2000 & in P. Daniel, Fl. Kerala 1: 750. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 234. 2009. *Vitis discolor* (Blume) Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 39. 1850; Hook. f., Fl. Brit. India 1: 648. 1875. *Cissus javana* DC., Prodr. 1: 628. 1824; Anil Kumar et al., Fl. Pathanamthitta 135. 2005.

Creeping or climbing shrubs; stem reddish, quadrangular. Leaves simple, alternate, 6-13 x 3-7 cm, acuminate, cordate at base, spinous serrate, usually red beneath; petiole 1-3 cm long. Cymes 2 cm across, reddish; peduncle 1 cm long. Flowers pedicelled. Calyx 2 mm across, rim white. Petals reddish, 1.5 mm long; disk pubescent. Berry 4 x 3 mm, oblique-obovoid, smooth; seeds pitted.

Pookundu, *KVB 31207*

Fl. & Fr.: July-January

Distribution: Fairly common in Semi-evergreen Forests of Pookundu.

Cissus glyptocarpa (Thw.) Planch. in A. & C. DC., Monogr. Phan. 5: 477. 1887; Gamble, Fl. Pres. Madras 235(168). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 104. 1988; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 285. 2000 & in P. Daniel, Fl. Kerala 1: 751. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 234. 2009. *Vitis glyptocarpa* Thw., Enum. Pl. Zeyl. 62. 1858; Hook. f., Fl. Brit. India 1: 645. 1875.

Creepers or climbers; branches with corky wings, glabrous. Leaves simple, alternate, 10 x 7 cm, ovate, acuminate at apex, cordate at base, serrate, puberulus, nerves 4-7 pairs; petiole to 3 cm long. Cymes 3 x 3 cm, extra-axillary, peduncled. Flowers many, 1.5 mm long, greenish; pedicels 10 mm long; petals 2 mm long, oblong, green. Fruits pyriform, purple; seed 1.

Mullenpara, *KJD 18775*

Fl. & Fr.: February-October

Distribution: Rare in Evergreen forests of Mullenpara.

Cissus latifolia Lam., Encycl. 1: 30. 1783; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 287. 2000 & in P. Daniel, Fl. Kerala 1: 752. 2005. *Vitis glauca* sensu Wight & Arn., Prodr. 126.1834; Hook. f., Fl. Brit. India 1:645.1875,p.p. *Vitis gigantea* Bedd., Trans. Linn. Soc. London 25: 212. 1866; Hook. f., Fl. Brit. India 1:648.1875. *Cissus glauca* sensu Gamble, Fl. Pres. Madras 234(168). 1918, non Roxb. 1820.

Large, climbing shrubs; stem thick; branchlets glaucous; tendrils usually forked. Leaves simple, alternate, 8-16 x 6-13 cm, broadly ovate-cordate or orbicular, acuminate at apex, margin serrate, serrations with bristly tip, glaucous below; petiole to 15 cm. Cymes leaf-opposed. Calyx cupular, ca. 2 mm long, fringed on margins. Petals 4, greenish-white, c. 2.5 mm long, hooded at apex. Stamens 4. Disc 4-lobed, adnate to ovary, yellow. Ovary tomentose; style thick; stigma truncate. Berry 1 cm across, ovoid, purplish, 1-seeded.

Chavachi, KVB 22580

Fl. & Fr.: June-September

Distribution: Fairly common along the boundaries of the Sanctuary.

TETRASTIGMA (Miq.) Planch. in Alph. de Candolle et A. C. de Candolle, Monogr. Phan. 5: 320, 423. 1887.

Tetrastigma leucostaphylum (Dennst.) Alston ex Mabb., Taxon 26: 539. 1977; Manilal & Sivar., Fl. Calicut 69. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 106. 1988; Shetty & P. Singh in N.P. Singh et al., Fl. India 5: 314. 2000 & in P. Daniel, Fl. Kerala 1: 761. 2005. *Cissus leucostaphyla* Dennst. Schluss. Hort. Malab. 17,19,33. 1818. *Tetrastigma muricatum* (Wall. ex Wight & Arn.) Gamble, Fl. Pres. Madras 229(164). 1918. *Tetrastigma lanceolarium* (Roxb.) Planch. in A. & C. DC., Monogr. Phan. 5: 423. 1887; Gamble, Fl. Pres. Madras 228(164). 1918; Vajr., Fl. Palghat Dist. 126. 1990. *Vitis muricata* Wall. ex Wight & Arn., Prodr. 128. 1834. *Vitis lanceolaria* sensu Lawson in Hook. f., Fl. Brit. India 1: 660. 1875,p.p., non Wall. 1831-32.

Woody scandent shrubs; stems strongly verrucose with elongated lenticels; tendril simple, woody with age. Leaves pedately 5-foliolate, trifoliolate or simple, sometimes all three types found on same plant; leaflets 4-13 x 2-6 cm, oblong-lanceolate, apex acute, base cuneate, margin coarsely serrate, especially distally, coriaceous, the laterals unequal sided; petiole to 8 cm long, warty-lenticellate, base swollen; petiioles 5-14 mm long. Flowers c. 4 mm across, in short axillary cymes. Calyx lobes 4, 1 mm long, more or less ciliolate. Petals 4, white, 1-1.5 mm long, ovate, acute, apically thickened. Disk lobed. Stamens 4. Ovary subglobose; stigma lobed. Berry 1.3 cm across, subglobose, creamy white; seeds 2-4, oblong, transversely rugose.

'S' Valavu, Moonamthode KVB 31538

Fl. & Fr.: February-August

Distribution: Fairly common in Evergreen forests of Moonamthode.

LEEACEAE

LEEA Royen ex L., Syst. Nat. ed. 12, 2: 627. 1767 *nom. cons.*

- 1a. Flowers red..... *L. guineensis*
- 1b. Flowers greenish yellow or white 2
- 2a. Leaves crenate, glabrous *L. indica*
- 2b. Leaves serrate, pubescent..... *L. asiatica*

Leea asiatica (L.) Ridsd. in Manilal, Bot. & Hist. Hort. Malab. 189. 1980; Ramach. & V.J. Nair, Fl. Cannanore Dist. 107. 1988; B.D. Naithani in N.P. Singh et al., Fl. India 5: 330. 2000; W. Arisdason et al. in P. Daniel, Fl. Kerala 1: 765. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 237. 2009. *Phytolacca asiatica* L., Sp. Pl. 474. 1753. *Leea crispa* Royen ex L., Syst. Nat. (ed. 12) 2: 627. 1767; Hook. f., Fl. Brit. India 1: 665. 1875; Gamble, Fl. Pres. Madras 240 (171). 1918. *Leea aspera* Edgw., Trans. Linn. Soc. London 20: 36. 1846; Gamble, Fl. Pres. Madras 240(171). 1918. *Leea herbacea* Ham., Trans. Linn. Soc. London 14: 228. 1823; Gamble, Fl. Pres. Madras 240(171). 1918. *Leea pumila* Kurz, J. Asiat. Soc. Bengal 41: 303. 1872; Hook. f., Fl. Brit. India 606. 1875. *Leea edgeworthii* Sant., Rec. Bot. Surv. India 19: 54. 1953.

Shrubs to small trees; stems branches, rachises, petiolules and peduncles often fluted and crispately winged. Leaves pinnate, alternate, 1 or 2-pinnate, densely soft-villous beneath when young; leaflets 5-7, 10-20 x 4-9 cm, broadly ovate to elliptic or ovate-oblong to elliptic, acute, acuminate to caudate at apex, rounded to cordate at base, sharply serrate at margin, chartaceous to subcoriaceous, glabrous or sparsely hairy above, densely hairy beneath with sparse globose pearl glands; petioles 1-4 cm long; stipule narrowly winged; rachises 4-12 cm long; lateral nerves 8-16 pairs; petiolules 5-15 mm long. Inflorescences 2-12 cm long, glabrous or pubescent; peduncles to 6 mm long; bracts ovate to linear-lanceolate, to 6 mm long, subpersistent; bracteoles lanceolate, 3 mm long; pedicels 1-2 mm long, pubescent. Flowers greenish white in corymbs. Calyx 2 x 3 mm, pubescent with prominent reticulate nervation, 5-lobed; lobes 3-angled. Corolla tube with staminal lobes 3-4 mm long, 5-lobed; lobes subulate, 2.5-3 x 1-1.5 mm. Staminal lobes deeply 2-fid; stamens free; filaments to 2 mm long; anthers oblong, to 1 cm long, medifixed; staminal column 3 mm long. Ovary globose-subglobose, less than 1 mm across, 4-8 loculed; style 1-2 mm long; stigma capitate. Fruits globose-depressed, 12 mm across, purple black; seeds usually 6, 5x 3 mm.

Ambalappara, KJD 31473

Fl. & Fr.: March-November

Distribution: Fairly common in Evergreen forests of Chavachi and Grasslands of Ambalappara.

Leea guineensis G. Don, Gen. Hist. 712. 1831; B.D. Naithani in N.P. Singh et al., Fl. India 5: 336. 2000; W. Arisdason et al. in P. Daniel, Fl. Kerala 1: 766. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 238. 2009. *Leea wightii* Clarke, J. Bot. 19: 105. 1881; Gamble, Fl. Pres. Madras 239(171). 1918.

Shrubs. Leaves bipinnate, leaflets 13-17 x 3-6 cm, ovate-lanceolate, apex caudate-acuminate, base truncate or acute, serrate; lateral nerves 7-10 pairs, intercostae sub-scalariform; petiolule 5-7 mm long; rachis to 23 cm long; stipules obovate, ca. 4 cm long. Cymes 2-6 cm across. Flowers crimson red, densely packed, 3-5 mm across. Calyx and corolla glabrous. Staminal tube shortly notched at apex. Berry 6-lobed, 6-7 mm across.

Chavachi, NS & KVB 31437

Fl. & Fr.: May-August

Distribution: Common in Evergreen forests of Chavachi and Chathurumala.

Leea indica (Burm. f.) Merr., Philipp. J. Sci. 14. 245. 1919; Manilal & Sivar., Fl. Calicut 70. 1982; Ansari, Fl. Kasaragod Div. 106. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 107. 1988; B.D. Naithani in N.P. Singh et al., Fl. India 5: 337. 2000; W. Arisdason et al. in P. Daniel, Fl. Kerala 1: 767. 2005;

Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 238. 2009. *Staphylea indica* Burm. f., Fl. Ind. 75,t.23. f.2. 1768. *Leea sambucina* (L.) Willd., Sp. Pl. 1: 1177. 1798; Hook. f., Fl. Brit. India 1: 666. 1875; Gamble, Fl. Pres. Madras 240(172). 1918.

Shrubs to small trees. Leaves 2 or 3-pinnate, leaflets 11-14 x 3-5 cm, oblong or elliptic-lanceolate, apex caudate-acuminate, serrate-dentate; lateral nerves 12-15 pairs, intercostae parallel, curved; stipules obovate-obtuse, to 5 x 4 cm. Young leaves bright-red. Cymes to 6 x 8 cm, peduncles 3-4 cm long, paired, axillary. Flowers greenish-white. Staminal tube shortly lobed at apex, anthers combined. Berry purple, ca. 6 mm across; seeds densely red-glandular.

Chelachode, KVB 31223

Fl. & Fr.: March-August

Distribution: Common in Evergreen forests of Chelachode, Chavachi and Vellachatamkunnu.

STAPHYLEACEAE

TURPINIA Raf., Med. Repos. 5: 352. 1808.

Turpinia malabarica Gamble, Bull. Misc. Inform. Kew 1917: 135. 1916. & Gamble, Fl. Pres. Madras 241(173). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 108. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 416. 2000; W. Arisdason & P. Daniel in P. Daniel, Fl. Kerala 1: 789. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 248. 2009.

Trees, to 20 m high, bole buttressed, bark greyish-brown. Leaves imparipinnate, opposite, stipulate; leaflets 3-7, opposite, stipellate; 5-12 x 1.5-5 cm, elliptic, elliptic-obovate, elliptic-ovate or elliptic-lanceolate, apex acuminate or obtusely acuminate, base acute or cuneate, margin serrate, glabrous, coriaceous; rachis 19-25 cm long, stout, swollen at base, glabrous; lateral nerves 4-7 pairs, pinnate, slender, prominent, intercostae reticulate, prominent. Flowers bisexual, yellowish-white, 8-10 mm across, in axillary and terminal panicles with opposite branches. Sepals 5, 3 mm long, ovate, slightly connate at base, obtuse, ciliate. Petals 5. Stamens 5; filaments shortly villous, inserted outside the disc; disc erect, crenate. Ovary sessile, superior, 3 lobed, 3-celled. Fruit a berry, subglobose, 1-3 pointed, but not lobed, glabrous; seeds complanate.

Meenmutty, KJD 22542

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Meenmutty.

SAPINDACEAE

- 1a. Herbaceous climbers with tendrils.....Cardiospermum
- 1b. Shrubs trees or scandent shrubs without tendrils 2
- 2a. Perianth of one series, petals absent..... 3
- 2b. Perianth of two series, both sepals and petals present 4
- 3a. Lower pair of leaflets reniform stipulate; fruit 2-3-lobed, densely muricate Otonophelium
- 3b. Lower leaflets not as above; fruit undivided, sparsely muricate.....Schleichera
- 4a. Leaves 3-foliolate Allophylus
- 4b. Leaves 5 or more foliolate 5
- 5a. Ovules 2 in each cell, fruit inflated 2-lobed.....Harpullia

- 5b. Ovule solitary in each cell, fruit not inflated..... 6
- 6a. Fruit tubercled, seeds arillate.....Dimocarpus
- 6b. Fruit not tubercled, seeds without aril..... 7
- 7a. Petals clawed, scaly inside Lepisanthes
- 7b. Petals not clawed, scales absent or minuteSapindus

ALLOPHYLUS L., Sp. Pl. 348. 1753.

- 1a. Scandent shrubs.....*A. concanicus*
- 1b. Erect shrubs 2
- 2a. Leaves glabrous *A. subfalcatus var. distachyus*
- 2b. Leaves tomentose..... 3
- 3a. Inflorescence branched.....*A. cobbe*
- 3b. Inflorescence unbranched*A. serratus*

Allophylus cobbe (L.) Raeusch., Nomencl. Bot. (ed. 3) 108. 1797; Hook. f., Fl. Brit. India 1: 673. 1875p.p; Ramach. & V.J. Nair, Fl. Cannanore Dist. 109. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 346. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 771. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 240. 2009. *Rhus cobbe* L., Sp. Pl. 267. 1753. *Schmidelia rheedei* Wight, Ic. t. 964. 1845. *Allophylus rheedei* (Wight) Radlk. in Engl. & Prantl, Naturl. Pflanzenfam. 3(5): 313. 1895; Gamble, Fl. Pres. Madras 246(176). 1918; Ansari, Fl. Kasaragod Div. 106. 1985.

Large shrubs to small trees; young stem and peduncles densely yellowish brown pubescent. Leaves trifoliolate; leaflets 8-12 x 5-7 cm, ovate or elliptic-ovate or rhomboid-ovate, acute at apex, cuneate at base, margins serrate towards the distal half, tomentose on both sides, domatia present in the axils of nerves; terminal leaflet larger; petiole to 11 cm long. Thyrses axillary, branched, longer than leaves, 12-16 cm long. Sepals 4, 0.5-1 mm long, ovate-obtuse. Petals 4, unequal, 0.5-1 mm long, white. Fruits ca. 4 mm across, globose.

Meenmutty, *KJD 26181*

Fl. & Fr.: June-November

Distribution: Fairly common in Evergreen forests of Meenmutty and Semi-evergreen forests of Paripode.

Allophylus concanicus Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 20:230.1890; Gamble, Fl. Pres. Madras 246(176). 1918; P.C. Pant in N.P. Singh et al., Fl. India 5:348.2000; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 241. 2009. *Allophylus concanicus* Radlk. var. *lanceolatus* Gamble, Fl. Pres. Madras 246(176). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 110. 1988.

Scandent shrubs; branchlets brownish, lenticellate. Leaves trifoliolate, leaflets to 13 x 6 cm, ovate, acuminate, cuspidate; 6-nerved, serrate towards the apex, black above when dried; midrib pubescent; domatia hairy. Raceme branched, hispid. Flowers solitary or paired, 2 mm across; pedicel 1 mm long. Sepals orbicular, ciliate. Petals 5 mm across, densely white hairy within; filaments hairy, reddish, connective broad; disk lobes 4, globular. Fruit subglobose, glabrous.

Narikkadavu, *KVB 31209*

Fl. & Fr.: October-April

Distribution: Common in Semi-evergreen forests of Narikkadavu, Pothanplavu and Kariyenkappu. Endemic to Western Ghats; Conservation Status: Critically Endangered.

Allophylus serratus (Roxb.) Kurz, J. Asiat. Soc. Bengal 44: 185. 1876; Gamble, Fl. Pres. Madras 246(175). 1918; Manilal & Sivar., Fl. Calicut 71. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 111. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 349. 2000; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 241. 2009. *Ornitrophe serrata* Roxb., Pl. Corom. t. 61. 1796. *Schmidelia serrata* (Roxb.) DC., Prodr. 1: 610. 1824. *Allophylus cobbe forma serratus* (Roxb.) Hiern in Hook. f., Fl. Brit. India 1: 673. 1875, p.p.

Shrubs; branchlets lenticellate. Leaves trifoliate, leaflets to 18 x 9 cm, ovate, acuminate at apex, attenuate at base; nerves ca. 13 pairs; petiolule 3-7 mm long; petiole 8-10 cm long. Flowers 3-5-together, 4 mm across; pedicel 3 mm long, jointed; sepals 1.5 mm diam., orbicular; petals 2 x 1 mm, spatulate; lobes of disc orbicular. Drupe 4 mm across, puberulus.

Paripode, KJD 18729

Fl. & Fr.: July-October

Distribution: Along forest boundaries near Farm.

Allophylus subfalcatus Radlk., Rec. Bot. Surv. India 3: 342. 1907, **var. distachyus** (DC.) Mukerjee, Indian For. 98: 493. 1972; P.C. Pant in N.P. Singh et al., Fl. India 5: 351. 2000; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 241. 2009. *Schmidelia distachya* DC., Prodr. 1: 610. 1824. *Allophylus cobbe forma distachya* (DC.) Hiern in Hook.f., Fl. Brit. India 1: 673. 1875. *Allophylus distachys* (DC.) Radlk. in Engl. & Prantl, Naturl. Pflanzenfam. 3:313. 1895; Gamble, Fl. Pres. Madras 246(176). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 110. 1988; Sasidh. et al., Bot. Stud. Med. Pl. Kerala 25,33. 1996.

Large shrubs; bark lenticelled, greyish white. Leaves long petioled, 3-foliate; leaflets ovate-lanceolate, 7-24 x 0.5-8 cm, long-acuminate, unequal at base, lateral ones usually smaller, glabrous to glossy, chartaceous, distantly serrate-dentate, repand crenate. Racemes dense flowered, unbranched. Sepals glabrescent. Petals cuneate; disc puberulous. Stamens 8, inserted and in bisexual flowers surrounding the ovary. Ovary usually 2-lobed, 2-loculed; in male flowers merely a pistillode; styles 2, ovule 1 in each cell. Fruits clavate-ellipsoid, glabrous, orange red. Seeds with short aril.

Pothurumi, KVB 31779; Kattikari, KJD 31899

Fl. & Fr.: November-March

Distribution: Fairly common in Evergreen forests of Kattikari and Pothurumi.

CARDIOSPERMUM L., Sp. Pl. 366. 1753.

Cardiospermum halicacabum L., Sp. Pl. 366. 1753; Hook. f., Fl. Brit. India 1: 670. 1875; Gamble, Fl. Pres. Madras 244(175). 1918; Manilal & Sivar., Fl. Calicut 70. 1982; Ansari, Fl. Kasaragod Div. 107. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 111. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 356. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 774. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 242. 2009.

Climbing or trailing herbs. Leaves alternate, bi-ternate; leaflets 2-4 x 1-2.5 cm, ovate-lanceolate, deeply dentate or lobed, apex acute to acuminate, membranous; petiole to 3 cm long. Flowers white, polygamous in 3-7-flowered axillary tendril-bearing peduncles; peduncle up to 5 cm long. Sepals 4, in 2-pairs, outer pair smaller. Petals 4, white, unequal, with basal scales. Stamens 8; filaments unequal, pilose. Ovary 3-locular; ovule 1-per locule; stigma 3-fid. Capsule papery, inflated, 3-lobed, winged. Seeds one in each chamber, black with a white eye.

Fl. & Fr.: July-February

Distribution: Along road side and disturbed forest areas.

DIMOCARPUS Louriero, Fl. Cochinch. 233. 1790.

Dimocarpus longan Lour., Fl. Cochinch. 233. 1790; Ramach. & V.J. Nair, Fl. Cannanore Dist. 111. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 358. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 776. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 242. 2009. *Euphoria longan* (Lour.) Steud., Nomencl. Bot. 1: 328. 1821. *Euphoria longana* Lam., Encycl. 3: 574. 1792. *Nephelium longana* (Lam.) Camp., Mem. Mus. Hist. Nat. Paris 18: 30. 1829; Hook. f., Fl. Brit. India 1: 688. 1875; Gamble, Fl. Pres. Madras 252(180). 1918. *Scytalia longan* (Lour.) Raeusch., Nomencl. Bot. (ed.3) 113. 1797.

Evergreen trees, to 18 m, high, bark greyish or reddish-brown, smooth, flaking off in thin scales; branchlets prominently white lenticellate, reddish-brown tomentose. Leaves paripinnate, alternate, estipulate; leaflets 8-20, subopposite or alternate, 5-20 x 2.5-6 cm, oblong, elliptic-oblong or oblong-lanceolate, apex acute or acuminate, base oblique or acute, margin entire, slightly undulate, glabrous above, glaucous beneath, coriaceous; rachis 12-18 cm, stout, grooved above, swollen at base, glabrous; lateral nerves 14-17 pairs, parallel, prominent, intercostae reticulate, faint. Flowers polygamous, 5-6 mm across, yellowish-white, in terminal and axillary brown tomentose panicles or racemes. Calyx cupular, tomentose; lobes 5 or 6, ovate, saccate at base. Petals 5 or 6, oblong, pilose at base, deflexed; disc annular, fleshy, lining the calyx tube. Stamens 8 or 10, inserted within the disc; filaments slender, hairy. Ovary superior, ovoid, 2 lobed, pubescent, 2-celled, ovule 1 in each cell; style simple; stigma bifid. Fruit a schizocarp of 1-2 cocci, 1-1.5 x 1 cm, globose, reddish-brown, with round tubercles or sometimes nearly smooth; seed one, black, covered by fleshy aril.

Chavachi, *KJD* 26049

Fl. & Fr.: March-August

Distribution: Fairly common in Evergreen forests of Chavachi and Meenmutty.

HARPULLIA Roxburgh, Fl. Ind. 2: 441. 1824.

Harpullia arborea (Blanco) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 16: 404. 1890; Ramach. & V.J. Nair, Fl. Cannanore Dist. 112. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 365. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 779. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 244. 2009. *Ptelea arborea* Blanco, Fl. Filip. (ed. 1) 63. 1837. *Harpullia imbricata* (Blume) Thw., Enum. Pl. Zeyl. 56. 1858; Gamble, Fl. Pres. Madras 253(180). 1918. *Octonychium imbricatum* Blume, Rumphia 3: 180. 1849. *Harpullia cupanoides* sensu Hiern in Hook. f., Fl. Brit. India 1: 692. 1875p.p., non Roxb. 1832.

Trees, to 15 m high, bole fluted; bark 3-5 mm thick, pale grey, smooth, lenticels horizontal, semi fibrous; branchlets fulvous tomentose. Leaves paripinnate, alternate, estipulate; leaflets 8-12, subopposite or alternate, 5-20 x 2.5-10 cm, lanceolate, oblong, elliptic-oblong or elliptic-lanceolate, apex acuminate, base oblique, margin entire, glabrous, membranous; rachis 9-31 cm, slender, pubescent, swollen at base; lateral nerves 7-12 pairs, pinnate,

slender, prominent; intercostae reticulate, prominent. Flowers polygamodioecious, 10-12 mm long, yellowish-green, in axillary, or subterminal drooping panicles. Sepals 5, free, imbricate. Petals 5, long clawed, oblong; disc small, 5 lobed. Stamens 5-8, inserted within the disc; filaments slender; anthers oblong. Ovary superior, ovoid, 2-celled, ovules 2 in each cell, super posed; style elongate; stigma linear, usually more or less twisted. Fruit a capsule, 20-25 x 30-35 mm, scarlet, 2 lobed, 2-celled, inflated, loculicidally 2 valved, coriaceous; seeds 2, ellipsoid, black, shining; aril orange.

Moonamthode, NS &KVB 31392

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests of Moonamthode.

LEPISANTHES Blume, Bijdr. 5: 237. 1825.

1a. Drupes united only at the base *L. erecta*

1b. Drupes united through out..... *L. tetraphylla*

Lepisanthes erecta (Thw.) Leenh., Blumea 17: 69. 1969; Ramach. & V.J. Nair, Fl. Cannanore Dist. 113. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 368. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 781. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 244. 2009. *Nephelium erectum* Thw., Enum. Pl. Zeyl. 57. 1858. *Sapindus erecta* (Thw.) Hiern in Hook. f., Fl. Brit. India 1: 683. 1875, "*erectus*". *Thraulococcus erectus* (Thw.) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 300. 1878; Gamble, Fl. Pres. Madras 251(179). 1918.

Shrubs. Leaves 35-50 cm long; Leaves paripinnate, alternate, leaflets 4 pairs, 20-25 x 5-9 cm, oblong, acute at either ends, nerves 10-13 pairs; petiolule 5 mm long, smooth. Panicle 20 x 5 cm, terminal, erect. Flowers clustered, subsessile. Sepals 5 x 3 mm, ovate, obtuse, pubescent outside. Petals 6 x 4 mm, obovate, broadly clawed; scale oblong, not lobed, hairy. Staminal filaments hairy above. Capsule 1.5 x 1 cm, oblong, obtuse, minutely fulvous-tomentose.

Moonamthode, KJD 25583

Fl. & Fr.: October-January

Distribution: Rare in Evergreen forests of Moonamthode.

Lepisanthes tetraphylla (Vahl) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 276. 1878; Gamble, Fl. Pres. Madras 247(176). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 113. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 372. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 781. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 245. 2009. *Sapindus tetraphylla* Vahl, Symb. Bot. 3: 1794. *Hemigyrosa canescens* (Roxb.) Blume, Rumphia 3: 166. 1849; Hook. f., Fl. Brit. India 1: 671. 1875. *Molinaea canescens* Roxb., Pl. Corom. t. 60. 1796. *Lepisanthes deficiens* (Wight & Arn.) Radlk., Sitzungsber. Math.-Phys. Cl. Koenigl. Bayer. Akad. Wiss. Muenchen 8: 276. 1878; Gamble, Fl. Pres. Madras 247(176). 1918. *Sapindus deficiens* Wight & Arn., Prodr. 111. 1834.

Evergreen trees, to 15 m high; trunk and branchlets crooked; bark reddish-brown, peels off in irregular thin scale, rough. Leaves paripinnate, alternate, estipulate; leaflets 4-8, opposite or subopposite, 6-22 x 2-6 cm, elliptic, oblong, elliptic-oblong, elliptic-lanceolate, obovate-oblong or oblong lanceolate, apex obtuse, emarginate, acute or acuminate, base acute, obtuse or unequal, margin entire, undulate, glabrous, coriaceous; rachis 1.5-20 cm,

terete, stout, glabrous, swollen at base; lateral nerves 6-13 pairs, pinnate, prominent, secondary laterals also prominent; intercostae reticulate, prominent. Flowers polygamodioecious, creamy yellow, crowded in axillary or terminal panicles; branches fulvous-tomentose. Sepals 5, hairy outside, glabrous within; outer 2 smaller than inner 3, in 2 rows. Petals 4-5, obovate, subequal, obtuse, 2-fid, fimbriate, inner surface callose at base and with 2-3 scales, often scales attached to the claw; disc thick, 4-5 lobed. Stamens 8; filaments free, pilose; anthers ovoid. Ovary superior, globose, eccentric, trigonus, 3-celled, ovules 1 each cell; style simple; stigma oblique. Fruit a drupe, 2 x 1.5 cm, subglobose or trigonus, orange-yellow, tomentose, apiculate; seed one, oblong, exarillate.

Moonamthode, *KJD 31811*

Fl. & Fr.: February-July

Distribution: Fairly common in Evergreen forests of Moonamthode.

OTONEPHELIUM Radalk., Sapind. Holland-Ind. Nachtr. 71. 1879.

Otonepnelium stipulaceum (Bedd.) Radlk., Sapindac. Holl. Ind. 71. 1879; Gamble, Fl. Pres. Madras 252(180). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 113. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 378. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 783. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 245. 2009. *Nepnelium stipulaceum* Bedd., Trans. Linn. Soc. London 25: 212. 1865 & Ic. t. 103. 1868-1874; Hook. f., Fl. Brit. India 1: 690. 1875; Gamble, Fl. Pres. Madras 252(180). 1918.

Trees, to 18 m high, bark 5-6 mm thick, pale brown, smooth, peels off in irregular thick scales. Leaves paripinnate, alternate, exstipulate; leaflets 4-8, opposite, subopposite or alternate, lower pair of leaflets stipule like, sessile, 1-2.5 x 1-2 cm, reniform, other leaflets 5.5-21 x 3-10 cm, obovate or elliptic, or elliptic-obovate, apex acuminate, base oblique, acute or cuneate, margin entire, glabrous above, glaucous beneath, coriaceous; rachis 3-20 cm, stout, glabrous; lateral nerves 9-10 pairs, parallel, prominent, regular, intercostae scalariform, prominent, domatia present. Flowers polygamous, cream coloured, 5-6 mm across, in axillary and terminal panicles. Calyx cupular; lobes 6, villous within. Petals 0; disc annular, fleshy, lobed. Stamens 8, filaments unequal, slender, inserted within the disc. Ovary superior, 2-4 lobed, 2-4-celled, pubescent, ovules 1 in each cell; style terminal 3-fid. Fruit a drupe of 1-3 cocci, 16-18 mm long, oblong or ovoid, covered with soft prickles; seeds 1-2, brown, smooth.

Kattikari State Boundary, *KJD 26016*

Fl. & Fr.: February-July

Distribution: Common in plantations of Kariyenkappu and Evergreen forests of Chavachi and Kattikari. Endemic to southern Western Ghats.

SAPINDUS Tourn. ex L., Sp. Pl. 367. 1753 .

Sapindus trifoliatus L., Sp. Pl. 367. 1753; Hook. f., Fl. Brit. India 1: 682. 1875; Ansari, Fl. Kasaragod Div. 108. 1985; P.C. Pant in N.P. Singh et al., Fl. India 5: 382. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 785. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 246. 2009. *Sapindus laurifolius* Vahl, Symb. Bot. 3: 54. 1794; Gamble, Fl. Pres. Madras 250(178). 1918; Manilal & Sivar., Fl. Calicut 71. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 114. 1988.

Trees, to 18 m high, bark 4-6 mm thick, greyish-brown; brittle or semi fibrous; branchlets lenticellate. Leaves paripinnate, alternate, estipulate; leaflets 4-6, opposite or subopposite, 6.5-25 x 2.5-11.5 cm, elliptic-oblong, elliptic-lanceolate, elliptic or lanceolate, apex acuminate, base oblique, round or acute, margin entire, glabrous, chartaceous; rachis 4.5-10 cm, stout, glabrous, swollen at base; lateral nerves 6-17 pairs, pinnate, ascending, prominent, secondary laterals prominent; intercostae reticulate, prominent. Flowers polygamous, greenish-white, 5-6 mm across, in axillary or terminal panicles; panicles densely pubescent. Sepals 5, pubescent outside, glabrous within, ovate, unequal, in 2 series, much imbricate. Petals 5, linear-lanceolate, softly woolly on the inner surface except the claw, scales minute or absent; disc concave, margin fleshy, hirsute. Stamens 8, inserted within the disc; filaments free, pilose; anthers oblong. Ovary superior, tomentose, not lobed, 2-3-celled, ovule 1 in each cell; style terminal, stigma 2-3 lobed. Fruit a drupe, 16-18 mm across, globose, greenish-yellow, fulvous hairy when young, wrinkled when ripe; seeds 2-3, globose, black.

Pothanplavu, *KJD 22503*

Fl. & Fr.: February-November

Distribution: Common in Semi-evergreen forests of Pothanplavu.

SCLEICHERA Willdenow, Sp. Pl. 4: 1096. 1806, *nom. cons.*

Schleichera oleosa (Lour.) Oken, Allg. Naturgesch. 3:1341. 1841; Manilal & Sivar., Fl. Calicut 71. 1982; Ansari, Fl. Kasaragod Div. 108. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 114. 1988; P.C. Pant in N.P. Singh et al., Fl. India 5: 384. 2000; P. Singh & E. Vajr. in P. Daniel, Fl. Kerala 1: 786. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 246. 2009. *Pistacia oleosa* Lour., Fl. Cochinch. 615. 1790. *Schleichera trijuga* Willd., Sp. Pl. 4: 1096. 1805; Hook. f., Fl. Brit. India 1: 681. 1875; Gamble, Fl. Pres. Madras 248(177). 1915.

Deciduous trees, to 20 m high, bole fluted; bark 10-12 mm thick, surface grey, smooth, brittle. Leaves paripinnate, alternate, exstipulate; leaflets 4-6, opposite or subopposite, 5-15 x 1.8-4.5 cm, elliptic-oblong, ovate or obovate, apex acute or obtuse, base oblique or rarely obtuse, margin entire, coriaceous, glabrous; rachis 5.5-11.5 cm, stout, glabrous, swollen at base; lateral nerves 10-23, parallel, prominent, intercostae reticulate, faint. Flowers polygamodioecious, 5-6 mm across, greenish-yellow, in axillary spicate panicles. Male flowers: calyx lobes 5, valvate or obscurely imbricate; petals 0; disc complete, with the disc; stamens 7 or 8, free, inserted within the disc; filaments 1.5 mm, pilose; anthers oblong; pistillode small. Bisexual flowers: ovary 2 mm, superior, 3-celled, ovule 1 in each cell; style rigid, terete; stigma 2 or 3 lobed. Fruit a drupe, 16-18 mm across, subcrustaceous, pointed, often echinate with stout rather blunt prickles; seed 1 or 2, enclosed in a pulpy aril which has a pleasant acid taste; testa smooth, brown.

Pothanpalvu, *KJD 22506*

Fl. & Fr.: March-June

Distribution: Fairly common in Semi-evergreen forests of Pothanplavu.

SABIACEAE

MELIOSMA Blume, Cat. Buitenzorg 10. 1823.

- 1a. Leaves simple *M. simplicifolia*
 1b. Leaves imparipinnate.....*M. pinnata* ssp. *barbulata*

Meliosma pinnata (Roxb.) Maxim. **ssp. barbulata** (Cufod.) Beus. in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 3: 384. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 115. 1988; S.C. Majumdar in N.P. Singh et al., Fl. India 5: 423. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 792. 2005. *Meliosma rhoifolia* Maxim. *ssp. barbulata* Cufod., Oest. Bot. 88. 254. 1939. *Millingtonia arnottiana* Wight, Illustr. 1: t.53. 1840. *Meliosma arnottiana* (Wight) Walp., Rep. 1: 423. 1842; Hook. f., Fl. Brit. India 2: 6. 1876, p.p.; Gamble, Fl. Pres. Madras 256(183). 1918. *Meliosma pinnata* (Roxb.) Maxim. *ssp. arnottiana* (Wight) Beus., Blumea 19: 499. 1971; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 248. 2009. *Millingtonia pinnata* Roxb., Fl. Ind. 1: 103. 1820.

Trees, to 18 m high, bark 10-15 mm thick, surface greyish-brown, mottled with white; branchlets brown villous, prominently lenticellate. Leaves imparipinnate, pinnate, alternate, estipulate; leaflets 9-15, opposite or subopposite, 3.5-12.5 x 1.5-4 cm, oblong, oblong-lanceolate, elliptic-oblong or elliptic-ovate; round or oblique, apex acuminate or acute, base obtuse, margin entire, glabrous above, rusty tomentose beneath, coriaceous; petiolule 4-10 mm, slender, rusty tomentose; rachis 6.5-18 cm long, stout, rusty pubescent; lateral nerves 3-15 pairs, pinnate, ascending, prominent, intercostae reticulate, domatia often present. Flowers bisexual, yellowish-white in large terminal and axillary tomentose panicles; bracteoles sepaloid. Sepals 5, basally connate, triangular, ciliate. Petals 3+2; inner ones 2-fid; outer 3 suborbicular, unequal. Fertile stamens 2; filaments 1.5 mm; staminodes 3, scaly, to 1 mm. Ovary superior, tomentose, 2-celled, ovule 2 in each cell; style terminal, stigma simple. Fruit a drupe, 5-6 mm across, globose.

Ambalappara, NS & KVB 31368

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Ambalappara.

Meliosma simplicifolia (Roxb.) Walp. Rep. 1: 423. 1842, **ssp. simplicifolia** Hook. f., Fl. Brit. India 2: 5. 1876; Gamble, Fl. Pres. Madras 256(182). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 115. 1988; S.C. Majumdar in N.P. Singh et al., Fl. India 5: 423. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 794. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 249. 2009. *Millingtonia simplicifolia* Roxb., Pl. Corom. 3: 50. t.254. 1820, p.p.

Trees, to 15 m high; bark greyish-yellow, smooth; branchlets glabrescent. Leaves simple, alternate, 9-40 x 2.5-15 cm, obovate-oblong to obovate, lanceolate, oblanceolate or oblong-lanceolate, apex acute, base cuneate or acute, margin entire, sometimes more or less dentate, glabrous, very rarely sparsely puberulous or pubescent on the midrib above especially in young leaves, sometimes sparsely pubescent beneath, often with domatia, coriaceous; petiole 15-50 mm, stout, puberulent, grooved above; lateral nerves 8-23 pairs, pinnate, ascending, intercostae reticulate, prominent. Flowers bisexual, subsessile, yellowish-white, solitary or more less crowded in lax panicles of 10-45 cm, branches slender, angular, sparsely to densely pubescent but never tomentose, the lower primary ones nearly always subtended by small to normal leaves. Sepals 4 or 5, ciliolate. Petals 3+2, yellow; inner petals bifid, lobes more or less divergent, narrow, glabrous, sometimes slightly fimbriate or ciliolate at the very tips; disc small, annular and toothed. Ovary superior, glabrous, 2-celled, 2-ovuled; style short. Fruit a drupe, globose, purple-black; endocarp subglobose, usually rather oblique, nearly triangular at ventral view, with more or less prominent rather coarse reticulum; median keel usually very prominent.

Ambalappara, NS & KVB 31421

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Ambalappara.

ANACARDIACEAE

- 1a. Leaves with out petiolar appendages..... 2
- 1b. Leaves with petiolar appendages..... Holigarna
- 2a. Leaves compound..... Spondias
- 2b. Leaves simple..... 3
- 3a. Inflorescence axillary fascicles, racemes or paniced racemes, carpals 3 Nothopegia
- 3b. Inflorescence panicles, carpal solitary 4
- 4a. Hypocarp fleshy, fruit reni-form nut Anacardium
- 4b. Hypocarp not fleshy, fruit drupe Mangifera

ANACARDIUM L., Sp. Pl. 383. 1753.

Anacardium occidentale L., Sp. Pl. 583. 1753; Hook. f., Fl. Brit. India 2: 20. 1876; Gamble, Fl. Pres. Madras 260(185). 1918; Manilal & Sivar., Fl. Calicut 73. 1982; Ansari, Fl. Kasaragod Div. 109. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 120. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 437. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 797. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 258. 2009.

Gregarious evergreen trees, to 15 m high, bark pale grey to brown, smooth with vertical striations; blaze dull pink; exudation sticky, red; branchlets glabrous. Leaves simple, alternate, somewhat crowded on twig apices, 6-15.5 x 3-8 cm, obovate; apex obtuse, round or retuse, base acute or cuneate, round, margin entire, glabrous, shiny above, coriaceous; petiole 7-15 mm, stout, swollen at base, glabrous; lateral nerves 10-15 pairs, parallel, prominent, intercostae reticulate, prominent; glands axillary on main nerves and its branches. Flowers polygamous, yellow, streaked with pink, in terminal prominently bracteate panicles. Calyx 5-partite, lanceolate, imbricate, deciduous, with some pubescence on outside. Petals 5, linear-lanceolate, ligulate, recurved, imbricate; disc filling the base of the calyx, erect. Stamens 8-10, one usually longer than others; filaments connate at the base and adnate to the disc, glandular puberulus. Ovary superior, obovoid or obcordate, 1-celled, ovule 1, ascending from a lateral funicle; style filiform, excentric; stigma minute. Fruit a reniform nut, 2-3 cm, grey, seated on a large pyriform fleshy body formed of enlarged disc and top of the pedicel; pericarp gives acrid caustic oil; seed reniform, ascending.

Paripode, KVB 31285

Fl. & Fr.: November-April

Distribution: Raised in plantations and also seen in earlier settlements.

HOLIGARNA Hamilton ex Roxb., Pl. Corom. 3: 79. 1820, *nom. cons.*

- 1a. Leaves brown tomentose beneath **2**
- 1b. Leaves glabrous beneath *H. arnottiana*
- 2a. Petiolar appendage 2 *H. beddomei*
- 2b. Petiolar appendage 4-6 *H. grahamii*

Holigarna arnottiana Hook. f., Fl. Brit. India 2: 36. 1876; Gamble, Fl. Pres. Madras 268(191). 1918; Manilal & Sivar., Fl. Calicut 73. 1982; Ansari, Fl. Kasaragod Div. 110. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 116. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 457. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 803. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 251. 2009.

Evergreen trees, to 20 m high; bole buttressed; bark 6-8 mm thick, pale brown, rough; exudation milky, caustic, black on drying; young shoot brown

tomentose. Leaves simple, alternate, crowded at the tips of branchlets, 8-25 x 2.5-7.5 cm, oblanceolate, apex obtusely acute, base cuneate or attenuate, margin entire, glabrous, coriaceous; petiole 7-15 mm, stout, tomentose; spur 1-2 pairs, deciduous, tomentose; lateral nerves 10-20 pairs, parallel, prominent, intercostae reticulate, prominent. Flowers polygamous, yellowish-brown, 2-3 mm across, in axillary panicles, tomentum of inflorescence pale golden brown. Calyx cupular, 5-fid. Petals 5, cohering at the base and with the edge of the disc, densely villous inside, valvate; disc lining the calyx tube, obscure in bisexual flowers. Stamens 5, inserted outside the disc; filaments subulate; anthers red, versatile. Ovary inferior, 1-celled, ovule pendulous; styles 3, divergent; stigmas capitate. Fruit a drupe, 2.5 cm long, obliquely-ovoid, glabrous, almost entirely included within hypocarp, resinous, acrid; seed parietal.

Narikkadavu, *KVB & KJD 31458*

Fl. & Fr.: January-July

Distribution: in Semi-evergreen forests of Narikkadavu, Pookundu, Valyamchal and River banks. Endemic to southern Western Ghats.

Holigarna beddomei Hook. f., Fl. Brit. India 2: 38. 1876; Gamble, Fl. Pres. Madras 269(192). 1918; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 459. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 804. 2005.

Large trees, to 24 m high; bark 3-4 mm thick, smooth, grey; exudation black on dryness. Leaves simple, alternate, 25-38 x 14-17 cm, oblanceolate, suddenly broadened above the middle, apex acuminate, base cuneate, margin entire, ciliate, pubescent beneath, coriaceous; petiole 10-25 mm, villous, stout; spur 2, slender, villous-pubescent, persistent; lateral nerves 20-30 pairs, parallel, prominent, midrib on upper surface ciliate, intercostae reticulate, prominent. Flowers small, polygamous. Calyx small, cupular, 5 fid, rusty tomentose. Petals 5, oblong, cohering at the base, villous inside, valvate; disc lining the calyx tube, with tuft of hairs at the centre. Stamens 5, inserted outside the disc; filaments subulate; anthers oblong-cordiform, versatile. Ovary inferior, 1-celled, ovule pendulous from near the top of the cell; styles usually 3, divergent; stigmas capitate. Fruit a drupe, hypocarp enclosing about 2/3 or 3/4 of drupe, obliquely ovoid; seeds parietal.

Kariyenkappu, *KJD 26349*

Fl. & Fr.: January-March

Distribution: Rare in plantations of Kariyenkappu. Endemic to southern Western Ghats; Conservation status: Endangered.

Holigarna grahamii (Wight) Kurz, J. Asiat. Soc. Bengal 42: 305. 1872; Hook. f., Fl. Brit. India 2: 37. 1876; Gamble, Fl. Pres. Madras 268(191). 1918; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 460. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 805. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 252. 2009. *Semecarpus grahamii* Wight, Ic. t. 235. 1839. *Holigarna wightii* Balakr., Journ. Bombay Nat. Hist. Soc. 63: 327. 1966.

Large evergreen trees, to 30 m high, bark 20-25 mm thick, surface yellowish-grey, mottled with green and white, smooth, lenticellate; outer bark 1-2 mm thick, dead, corky, inner bark thick, brittle, inner layers fibrous; exudation scanty, colourless, become black on drying; branchlets brown tomentose. Leaves simple, alternate, clustered at the tips of branchlets, 15-70 x 7-25 cm, oblanceolate, suddenly broad above the middle, apex acuminate, base cuneate or acute, margin entire, glabrous above, densely golden brown tomentose below, coriaceous; petiole 15-50 mm long, stout, broadened at base, brown tomentose; spur 2 pairs, stout, persistent, brown tomentose; lateral nerves many, parallel, prominent; intercostae reticulate, prominent. Flowers small, polygamous, dull white, in terminal rusty

tomentose panicles. Calyx cupular, shortly 5-toothed. Petals 5, cohering at the base and with the edge of the disc, villous within; disc lining the calyx tube, obscure in bisexual flowers. Stamens 5, inserted outside the disc; filaments subulate; anthers versatile. Ovary inferior, 1-celled, ovule pendulous from near the top of the cell.; styles usually 3, divergent; stigmas capitate. Fruit a drupe, 2/3-3/4th included in hypocarp, vertically shallowly grooved, ovoid, reddish-purple.

Kariyenkappu, *KVB 31607*

Fl. & Fr.: October-March

Distribution: Rare in plantations of Kariyenkappu. Endemic to Western Ghats; Conservation Status: Vulnerable.

MANGIFERA L., Sp. Pl. 200. 1753.

Mangifera indica L., Sp. Pl. 200. 1753; Hook. f., Fl. Brit. India 2: 13. 1876; Gamble, Fl. Pres. Madras 259(185). 1918; Manilal & Sivar., Fl. Calicut 73. 1982; Ansari, Fl. Kasaragod Div. 111. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 117. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 466. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 808. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 253. 2009.

Evergreen trees, to 30 m high, bark 2-2.5 cm, dark grey, rough with vertical fissures; exudation yellowish, gummy. Leaves simple, alternate, clustered at the tips of branchlets, 9.2-40 x 2.5-8 cm, elliptic, elliptic-lanceolate, linear-oblong, apex acuminate, acute or obtusely acute, base attenuate or acute, margin entire, glabrous, shiny, coriaceous; petiole 10-75 mm long, stout, glabrous, pulvinate; lateral nerves 14-28 pairs, pinnate, prominent; intercostae reticulate, prominent. Flowers polygamous, yellowish-green, in terminal panicles; pedicels jointed; bract deciduous. Calyx 4-5 partite, ovate, imbricate, hairy without, cauducous. Petals 4-5, oblong-obovate, subequal, nerves at base gland crested, free or adnate to the disc; disc fleshy, cupular, 4-5 lobed. Stamens 4-5, inserted inside or on the disc, fertile stamens 1 or 2; filaments free, glabrous; staminodes gland-tipped. Ovary sessile, superior, oblique, 1-celled, ovule pendulous; style lateral; stigma simple. Fruit a drupe, 5-15 cm long, oblong-reniform, compressed, yellowish-red, mesocarp fleshy, endocarp fibrous; seed subreniform.

Moonamthode, *KJD 25593*

Fl. & Fr.: January-June

Distribution: Fairly common in Evergreen forests of Meenmutty, Monamthode, also at earlier settlements.

NOTHOPEGIA Blume, Mus. Bot. 1: 203. 1850, *nom. cons.*

- 1a. Inflorescence axillary fascicles or in racemes less than 1 cm long *N. travancorica*
- 1b. Branchlets and inflorescens glabrous, inflorescens 2-4 cm long 2
- 2a. Petiole twisted, lateral nerves obscure *N. racemosa*
- 2b. Petiole not twisted, lateral nerves prominent..... 3
- 3a. Twigs stout, a. 5mm thick; leaf apex obtuse *N. monadelpha*
- 3b. Twigs slender, less than 3mm thick, leaf apex acute to acuminate *N. beddomei*

Nothopegia beddomei Gamble, Bull. Misc. Inform. Kew 1918: 227. 1918 & Fl. Pres. Madras 265(189). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 118. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 473. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 811. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 254. 2009. *Nothopegia beddomei* Gamble *var. wynaadica* Ellis & Chandra., Bull. Bot. Surv. India 12: 257. 1970; D. Chandra & S.K. Mukh. in

N.P. Singh et al., Fl. India 5: 473. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 811. 2005.

Trees, to 15 m high, bark 5-6 mm thick, grey-brown, mottled with white and green, smooth, brittle; outer bark 1 mm thick, dark, dead; inner bark 4-5 mm thick; exudation scanty, white, acrid; branchlets slender. Leaves simple, alternate, 4-15 x 1.2-4.5 cm, elliptic or elliptic-oblong, acute at both ends, margin entire, glabrous, coriaceous; petiole 3-10 cm, slender, glabrous, grooved above; lateral nerves 10-25 pairs, parallel, prominent, intercostae subscalariform, prominent. Flowers small, polygamous, in axillary racemes, some times subterminal. Calyx small, 4-lobed, margins ciliate with many dark longitudinal swellings on ventral surface, persistent, imbricate. Petals 4, oblong, glabrous, spreading, imbricate; disc annular, 4-lobed. Stamens 4, inserted under the margin of the disc; filaments subulate, anthers oblong, introrse. Ovary ovoid, superior, 1-celled, style short; stigma capitate; ovule pendulous from near the top of the cell from a flattened funicle. Fruit a drupe, fleshy, ovoid, acute at apex, blue; pericarp thick filled with black resin cells; seed pendulous.

Mullenpara, NS &KVB 31361; KVB 31596; Asthipara, KVB 31628

Fl. & Fr.: January-June

Distribution: Fairly common in Evergreen forests of Mullenpara and Asthipara.

Nothopegia monadelpha (Roxb.) Forman, Kew Bull. 53: 754. 1998. *Blackburnia monadelpha* Roxb., Fl. Ind. 1: 435. 1820. *Pegia ?colebrookeana* Wight, Ic. t. 230. 1839. *Nothopegia colebrookeana* (Wight) Blume, Mus. Bot. Lugd.-Bat 1: 203. 1850; Hook. f., Fl. Brit. India 2: 40. 1876; Gamble, Fl. Pres. Madras 265(189). 1918; V. Chandra. in P. Daniel, Fl. Kerala 1: 811. 2005.

Evergreen trees, to 12 m high, bark greyish-brown, smooth; exudation white, acrid, branchlets dark, lenticellate, ultimate branchlets pubescent. Leaves simple, alternate, 5-15 x 2.5-5 cm, elliptic, elliptic-obovate, elliptic-oblong or obovate, apex acuminate, base acute, narrowed or attenuate, margin entire, glabrous, coriaceous; petiole 10-17 mm, stout, glabrous, grooved above; lateral nerves 15-21 pairs, parallel, prominent, intercostae scalariform, prominent. Flowers small, polygamous, greenish-white, 5-6 mm across, in axillary rufous racemes. Calyx small, 4-lobed; lobes orbicular, tomentose, persistent, imbricate. Petals 4, oblong, puberulus inside, densely tomentose outside, suberect with recurving tips; disc annular, 4-lobed. Stamens 4, inserted under the margin of the disc; filaments subulate, glabrous; anthers oblong, introrse. Ovary sessile, superior, ovoid, 1-celled, ovule pendulous from near the top of the cell; style short; stigma capitate. Fruit a drupe, 1-2 cm across, fleshy, pinkish-red, globose, acute at apex, pericarp thick, filled with black resin-cells.

Way to Pothurumi from Ambalappara, KVB 31731

Fl. & Fr.: January-May

Distribution: Rare in Evergreen forests of Pothurumi-Ambalappara region.

Nothopegia racemosa (Dalz.) Ramam. in Saldanha & Nicolson, Fl. Hassan Dist. 377. 1976; Ramach. & V.J. Nair, Fl. Cannanore Dist. 119. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 476. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 812. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 255. 2009. *Glycyarpus racemosus* Dalz., J. Asiat. Soc. Bombay 3: 69. 1849. *Nothopegia dalzellii* Gamble, Fl. Pres. Madras 265(189). 1918.

Nothopegia colebrookeana sensu Hook. f., Fl. Brit. India 2:40.1876 p.p., non (Wight) Blume 1850.

Trees, to 10 m high, bark greyish-brown, smooth; branchlets glabrous. Leaves simple, alternate, 12-20 x 3.5-6.5 cm, elliptic-oblong, oblong, oblanceolate or obovate, apex acuminate, base acute, margin entire, glabrous, coriaceous; petiole 8-20 mm, stout, glabrous; lateral nerves 13-many, parallel, prominent; intercostae scalariform, prominent. Flowers small, polygamous, white, bracteate, in axillary, rusty pubescent racemes. Calyx small, 4-lobed, persistent, imbricate; lobes broadly ovate, pubescent above with many longitudinal swellings beneath. Petals 4, oblong, glabrous except ciliate hairs on the mid nerve, in curved, imbricate; disc annular, 4-lobed. Stamens 4, inserted under the margin of the disc; filaments glabrous or slightly pubescent; anthers shortly oblong, introrse. Ovary sessile, superior, ovoid, 1-celled; ovule pendulous from near the top of the cell from a flattened funicle; style short; stigma capitate. Fruit a drupe, fleshy, globose, transversely oblong, striate, depressed at apex; pericarp thin; seed pendulous.

Mullenpara, *KJD 26261*

Fl. & Fr.: May-June

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to Western Ghats

Nothopegia travancorica Bedd. ex Hook. f., Fl. Brit. India 2: 40. 1876; Gamble, Fl. Pres. Madras 265(189). 1918; Ansari, Fl. Kasaragod Div. 111. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 119. 1988; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 477. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 813. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 256. 2009.

Shrubs, branchlets lenticellate, ferruginous tomentose. Leaves simple, alternate, 10-14 x 3-4 cm, elliptic-oblong, apex obtusely acuminate, nerves many, intercostae regular, closely parallel; petiole to 1 cm long, curved. Racemes condensed, axillary. Flowers few, white. Calyx ferruginous tomentose. Petals 1.5 mm long, ovate, acute, hairy inside, ciliate. Fruits 8 mm across, depressed globose, reddish-purple.

Chelachode, *KVB 31225*

Fl. & Fr.: December-May

Distribution: Common in Evergreen forests of Chelachode, Chavachi, Moonamthode and Kattikari. Endemic to southern Western Ghats.

SPONDIAS L., Sp. Pl. 1: 371. 1753.

Spondias pinnata (L. f.) Kurz, Prelim. Rep. For. & Veg. Pegu Append. A.44. & B.42. 1875; Manilal & Sivar., Fl. Calicut 72. 1982; Ansari, Fl. Kasaragod Div. 111. 1985; D. Chandra & S.K. Mukh. in N.P. Singh et al., Fl. India 5: 507. 2000; V. Chandra. in P. Daniel, Fl. Kerala 1: 819. 2005; Sunil Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 257. 2009. *Mangifera pinnata* L. f., Suppl. Pl. 156. 1781. *Spondias mangifera* Willd., Sp. Pl. 2: 751. 1799; Hook. f., Fl. Brit. India 2: 42. 1876; Gamble, Fl. Pres. Madras 261(186). 1918.

Deciduous trees, to 25 m high, bark surface grey to pale brown, smooth, vertically striated; exudation colourless, gummy. Leaves imparipinnate, alternate, clustered at the end of branches, stipulate; rachis 25-45 cm, slender, glabrous, swollen at base; leaflets 5-21, 4-23 x 2.5-10 cm, oblong, elliptic or elliptic-oblong, apex acuminate or obtusely acuminate, base obtuse,

subacute, oblique or round, opposite or subopposite; petiolule 2-8 mm long, slender, glabrous; margin entire, glabrous, chartaceous or membranous; lateral nerves many, parallel, close, slender, prominent, connected by an intramarginal nerve, intercostae reticulate. Flowers polygamous, yellowish-white, subsessile, in terminal spreading panicles; calyx small; lobes 5, imbricate, deciduous; petals 5, oblong, glabrous, spreading, valvate; disc thick, annular, 10-crenate; stamens 10, inserted below the disc; filaments slender; anthers versatile; ovary ovoid or subglobose, superior, immersed in the disc, 5-celled, 1 ovule in each cell, pendulous; styles 5, connivent; stigma spreading. Fruit a fleshy drupe, 3.8-5 cm long, yellow, endocarp woody surround by longitudinal interwoven fibres; seeds 1-3, of which only one is perfect, pendulous, oblong.

Chelachode, *KJD 31291*

Fl. & Fr.: March- December

Distribution: Common in Semi-Evergreen forests of Pothanplavu

CONNARACEAE

CONNARUS L., Sp. Pl. 675. 1753.

- 1a. Leaflets with venation prominently reticulate, glabrous; follicles ovoid, slightly compressed.....*C. paniculatus*
 1b. Leaflets faintly reticulate, tomentose along the nerves below; follicles, biconvex, stipitate..... *C. monocarpus*

Connarus monocarpus L., Sp. Pl. 675. 1753; Hook. f., Fl. Brit. India 2: 50. 1876; Gamble, Fl. Pres. Madras 272(194). 1918; Manilal & Sivar., Fl. Calicut 74. 1982; M.S. Mondal in N.P. Singh et al., Fl. India 5: 526. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 810. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 258. 2009.

Scandent shrubs; young parts ferruginous tomentose. Leaves imparipinnate; leaflets 3 or 5, 4-8 x 2.5-4 cm, elliptic or elliptic-ovate, base rounded, apex acuminate, thin-coriaceous; young flush coppery brown; petiolule upto 4 mm long. Flowers in terminal, pyramidal paniculate cymes, ferruginous-tomentose; pedicel c. 4 mm long. Sepals upto 3 mm long, narrowly triangular or oblong, puberulous without. Petals 6-8 mm long, linear-oblongate, creamy white. Stamens in 2 whorls; filaments with glandular appendages. Ovary subglobose, densely pubescent, brownish, 1-locular; ovules 2. Fruit a follicle, 2.5-4 x 1.5-2 cm, obovoid, fusiform, compressed, more or less falcate, scarlet red; seed single, c.1.5 cm long, ovoid, surrounded at base with a large, pulpy, bright yellow aril.

Moonamthode, *NS &KVB 31395*

Fl. & Fr.: April-December

Distribution: Rare in Evergreen forests of Moonthode, Kattikari and Pothurumi.

Connarus paniculatus Roxb., Fl. Ind. 3: 139. 1832; Hook. f., Fl. Brit. India 2:52.1876; Gamble, Fl. Pres. Madras 273(194). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 120. 1988; M.S.Mondal in N.P. Singh et al., Fl. India 5: 529. 2000; N.P. Balakr. in P. Daniel, Fl. Kerala 1: 824. 2005.

Large shrubs or lianas; bark minutely lenticelled, reddish brown; innovations minutely ferruginous-tomentose, early glabrescent. Leaves

alternate, imparipinnate, glabrous, leaflets 3-7, , 4-20 x 2.5-6.5 cm, elliptic-ovate or oblong-elliptic to lanceolate, obtusely acuminate at apex rigidly chartaceous, narrow to rounded or subpeltate at base, shining, densely and distinctly areolate-reticulate beneath; rachises 4-20 cm long; lateral nerves 5-8 pairs, arcuate, ascending or patent; petiolules ca 5 mm long. Inflorescences terminal and axillary, paniced, 10-40 cm long; peduncles 2-18 cm long, densely ferruginous-tomentose to glabrescent; pedicels rusty-tomentose; bracts scaly, minute. Sepals boat-shaped, obtuse, ca 3 mm long, rusty-tomentose and glandular-punctate on both sides. Petals narrowly spatulate, obtuse, ca 6 mm long, yellow or white and sparsely puberulous outside, white and glandular-punctate inside. Stamens 10, all fertile; filaments connate at base for ca 1 mm, glandular-pubescent. Ovary red. Follicles obovoid or oblong, laterally compressed-inflated, obtuse or acutely apiculate at oblique lateral apex, attenuate at base with ca 5 mm long slender stalk, 2-3.5 x 1.6-1.8 cm, bright red turning brown when dry; ventral suture curved, keeled, the dorsal gibbous; valves thin, coriaceous, glabrous outside, reddish brown, densely pubescent to glabrescent and glandular inside; seeds compressed, 2-2.5 x 1-1.5 cm, black with cupular yellow aril towards the base.

Ambalappara, KVB 31591

Fl. & Fr.: October-May

Distribution: Rare in Evergreen forests of Ambalappara and Pothurumi.

FABACEAE/LEGUMINOSAE

- 1a. Flowers actinomorphic; petals valvate in bud; stamens usually indefinite **Mimosoideae**
- 1b. Flowers zygomorphic; petals imbricate or zero; stamens definite, 10 or fewer **2**
- 2a. Corolla papilionaceous, aestivation imbricate-descending **Faboideae**
- 2b. Corolla caesalpiniaaceous, aestivation imbricate **Caesalpinioideae**

Subfamily FABOIDEAE (PAPILIONOIDEA)

- 1a. Leaves with 2 leaflets Zornia
- 1b. Leaves 1, 3 or many foliolate 2
- 2a. Leaves 5 or more foliolate 3
- 2b. Leaves 1 or 3 foliolate 12
- 3a. Leaves parpinnate 4
- 3b. Leaves imparipinnate 5
- 4a. Climbers; stamens 9 Abrus
- 4b. Herbs; stamens 5 + 5 Smithia
- 5a. Trees 6
- 5b. Climbers, shrubs or herbs 8
- 6a. Leaflets opposite; pods woody Pongamia
- 6b. Leaflets alternate; pods not woody 7
- 7a. Flowers white; pods linear, not winged Dalbergia
- 7b. Flowers yellow; pods orbicular, winged Pterocarpus
- 8a. Woody scandent shrubs or climbers 9
- 8b. Shrubs or herbs 11
- 9a. Pods winged on both the margins Aganope
- 9b. Pods not winged, if winged then on one margin only 10
- 10a. Leaves rugose reticulate; flowers purple Kunstleria
- 10b. Leaves otherwise; flowers white Derris

11a. Leaflets parallel veined; anthers obtuse; pods continuous within	Tephrosia
11b. Leaflets reticulately veined; anthers apiculate; pods septate between seeds.....	Indigofera
12a. Trees branches prickly; standard petal much longer than other petals...	Erythrina
12b. Branches not prickly; herbs shrubs or climbers; standard petal equaling other petals	13
13a. Herbs or shrubs	14
13b. Climbers	19
14a. Pods breaking at joints into 1-seeded articles.....	15
14b. Pods not breaking at joints into 1-seeded articles, dehiscent along suture	16
15a. Pod twisted, joints come face to face, enclosed in the calyx.....	Uraria
15b. Pod not twisted and enclosed in calyx.....	Desmodium
16a. Pod inflated, turgid.....	17
16b. Pod flat, compressed	18
17a. Stamens 10, monadelphous; anthers dimorphous; flowers usually yellow, sometimes blue or white; ovules 3 or more	Crotalaria
17b. Stamens diadelphous, 9+1; anthers uniform; ovules 2	Flemingia
18a. Fruit viscid pubescent; flowers pink or white	Pseudarthria
18b. Fruit not viscid pubescent; flowers yellow	Cajanus
19a. Alternate anthers short and long	20
19b. All anthers uniform	21
20a. Flowers in pendulous racemes, flowers ca. 3.5 cm long, purple	Mucuna
20b. Flowers in erect racemes, flowers 4-5 mm long, pink.....	Teramnus
21a. Ovary 2 ovuled	Rhynchosia
21b. Ovary 3 or more ovuled	22
22a. Style bearded below the stigma	23
22b. Style not bearded below the stigma.....	24
23a. Standard appendaged at back; pods with 4 raised ribs near margins, apical horn to 1 cm long, pointed, calyx faintly spurred	Centrosema
23b. Standard appendaged within; pods without raised ribs near margins, apical horn absent or very short; calyx not spurred	Vigna
24a. Stamens 10, monadelphous	Neonotonia
24b. Stamens 9+1, diadelphous	25
25a. Nodes of raceme swollen; pods 1-seeded, indehiscent.....	Spatholobus
25b. Nodes of raceme not swollen; pods 2 or more seeded, dehiscent	26
26a. Calyx-lobes setaceous, all free; pod obscurely angled, straight.....	Calopogonium
26b. Calyx-lobes ovate, upper ones connate; pod linear, flat	Shuteria

ABRUS Adanson, Fam. 2: 327, 511. 1763.

- | | |
|---|-----------------------|
| 1a. Seeds black or brown, compressed | <i>A. pulchellus</i> |
| 1b. Seeds red with a black top, globose | <i>A. precatorius</i> |

Abrus precatorius L., Syst. Nat. (ed. 12) 2: 472.1767; Hook. f., Fl. Brit. India 2:175.1876; Gamble, Fl. Pres. Madras 349(247). 1918; Ansari, Fl. Kasaragod Div. 115. 1985; Sanjappa, Legumes Ind. 74. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 263. 2009. *Glycine abrus* L., Sp. Pl. 753. 1753.

Woody perennial twining shrubs; young stems puberulent. Leaves even-pinnate; leaflets 12-16 pairs, 0.8-2.5 x 0.4-1 cm, oblong to elliptic, base and apex obtuse, lower surface sparsely pubescent. Flowers pink, in axillary racemes; bracts deltoid, minute; bracteoles c. 1mm across, suborbicular. Calyx 2-4 mm long, hispid. Petals 9-12 mm long. Stamens 9, monadelphous. Ovary sessile, many ovuled; style incurved. Pods 3-4 x 1-1.5 cm, oblong, slightly inflated, fulvo-puberulent; seeds many, 5-7 x 4-5 mm, subglobose, scarlet red with black eyes.

Paripoode, *KJD 22513*

Fl. & Fr.: October-May

Distribution: Along the boundaries near Paripoode.

Abrus pulchellus Wall. ex Thw., Enum. Pl. Zeyl. 91. 1859; Hook. f., Fl. Brit. India 2: 175. 1876; Gamble, Fl. Pres. Madras 350(247). 1918; Manilal & Sivar., Fl. Calicut 83. 1982; Ansari, Fl. Kasaragod Div. 116. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 124. 1988; Sanjappa, Legumes Ind. 74. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 263. 2009.

Twining herbs, glabrous. Leaves paripinnate, leaflets opposite, to 11 pairs, to 3 x 1 cm, oblong, obtuse, chartaceous, terminal leaflets larger; stipule lanceolate, deflexed. Flowers crowded in short tubercles, on long axillary racemes. Calyx cupular, truncate. Petals to 1 cm long, mauve; standard obovate; wings falcate, clawed; keel oblong. Stamens monadelphous. Ovary densely hairy. Pods 7 x 1 cm, oblong, slightly curved, compressed, glabrous; seeds many, 6 x 4 mm, dark red.

Paripode, *KJD 18715*

Fl. & Fr.: October-March

Distribution: Along the boundaries near Paripoode.

AGANOPE Miquel, Fl. Ind. Bat. 1: 151. 1855.

Aganope thyrsoflora (Benth.) Polhill **var. eualata** (Bedd.) Thoth. & Das, Rheede 2: 63. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 264. 2009. *Derris thyrsoflora* Benth. **var. eualata** (Bedd.) Thoth., Bull. Bot. Surv. India 3: 195. 1961. *Derris eualata* Bedd., Ic. t. 186. 1868-1874; Gamble, Fl. Pres. Madras 388(274). 1918. *Derris platyptera* Baker in Hook. f., Fl. Brit. India 2: 245. 1878. *Aganope thyrsoflora* (Benth.) Polhill, Kew Bull. 25: 270. 1971; Manilal & Sivar., Fl. Calicut 80. 1982; Ansari, Fl. Kasaragod Div. 116. 1985; Sanjappa, Legumes Ind. 76. 1992.

Large woody climbing shrubs. Leaflets 7-9, 4-10 x 2.5-4 cm, elliptic-ovate, apex acuminate, base rounded. Flowers in axillary and terminal large panicles of racemes; peduncles and pedicels densely pubescent. Calyx 2.5-3 mm long, campanulate, truncate, densely pubescent without. Corolla white, 5-7 mm long. Stamens with filaments 5-6 mm long, united half-way. Ovary 5-6 mm long, laterally compressed, densely hairy, winged on both sutures, reticulate without. Seeds 1-3, compressed.

Kurumbankallu *KJD 18722*

Fl. & Fr.: March-August

Distribution: Rare in Evergreen forests of Kurumbankallu. Endemic to southern Western Ghats.

CAJANUS A. P. de Candolle,

Cat. Horti Monspel. 85. 1813, *nom. cons.*

1a. Erect shrubs; leaves glandular below *C. lineatus*

1b. Climbing herbs or shrubs..... 2

2a. Pods not constricted between seeds, seed without prominent strophiole ... *C. heynei*

2b. Pods constricted between seeds, seed with prominent strophiole *C. scarabaeoides*

Cajanus heynei (Wight & Arn.) van der Maesen, Agric. Univ. Wageningen Pap. 85-4:129. 1985; Sanjappa, Legumes Ind. 101. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 268. 2009. *Dunbaria heynei* Wight & Arn., Prodr. 258. 1834; Hook. f., Fl. Brit. India 2: 217. 1876; Gamble, Fl. Pres. Madras 370(261). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 142. 1988.

Twining herbs, stem patently hairy. Leaves alternate, trifoliolate; leaflets 7 x 4.5 cm, obovate, caudate-acuminate, lateral leaflets oblique, tomentose. Flowers 2 cm long, confined towards the tip of axillary racemes. Calyx red, pubescent. Petals yellow. Pod villous, 3 cm long; seeds 4 or 5.

Kariyenkappu, *KJD 18748*

Fl. & Fr.: October-February

Distribution: Fairly common in Plantations of Kariyenkappu and Evergreen forests of Chavachi.

Cajanus lineatus (Wight & Arn.) van der Maesen, Agric. Univ. Wageningen Pap. 85-4:143. 1985; Sanjappa, Legumes Ind. 101. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 268. 2009. *Atylosia lineata* Wight & Arn., Prodr. 258. 1834; Hook. f., Fl. Brit. India 2: 213. 1876; Gamble, Fl. Pres. Madras 368(260). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 126. 1988.

Erect shrubs, branchlets silky tomentose. Leaves alternate; leaflets 3-4 x 1.5 cm, obovate or rhomboid, apex mucronate, base acute, 3-ribbed, grey tomentose below, subsessile; petiole to 1.5 cm long. Flowers to 1.5 cm long, yellow, in axillary pairs. Calyx tomentose, lobes deltoid, acuminate. Ovary densely villous. Pods to 2 x 0.8 cm, densely hairy; seeds 3.

Ambalappara, *KJD 26305*; Ambalappara, *KVB 31797*

Fl. & Fr.: June-January

Distribution: Fairly common in Grasslands of Ambalappara. Endemic to Western Ghats.

Cajanus scarabaeoides (L.) Thouars, Dict. Sci. Nat. 6: 617. 1817; Sanjappa, Legumes Ind. 100. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 269. 2009. *Dolichos scarabaeoides* L., Sp. Pl. 726. 1753. *Atylosia scarabaeoides* (L.) Benth. in Miq., Pl. Jungh. 242. 1852; Hook. f., Fl. Brit. India 2: 215. 1876; Gamble, Fl. Pres. Madras 369(261). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 127. 1988; Manilal & Sivar., Fl. Calicut 92. 1982.

Slender twining herbs; stem brown tomentose. Leaves 3-foliolate; leaflets to 4 x 2.5 cm, obovate or elliptic, obtuse, basally 3-nerved, reticulations prominent, often with resinous dots below, exstipellate. Flowers racemose or paniculate, pale-yellow, 0.8 cm long in axillary pairs; bracts large, caducous; bracteoles absent. Calyx persistent, tomentose, lobes linear, 0.5 cm long, upper 2-lobes connate. Standard petal with two inflexed auricles at base; keel petals slightly incurved. Stamens 9+1; anthers uniform. Ovary tomentose, sessile, 3 or more ovuled; style filiform, inflexed; stigma small, terminal. Pods brown tomentose, 2-2.5 cm long, obliquely deeply grooved between seeds; seeds strophiolate.

Kariyenkappu, *KJD 18750*

Fl. & Fr.: September-January

Distribution: Rare in Plantations of Kariyenkappu.

CALOPOGONIUM Desvaux, Ann. Sci. Nat. (Paris) 9: 423. 1826.

Calopogonium mucunoides Desv., Ann. Sci. Nat. (Paris) 9: 423. 1826; Ansari, Fl. Kasaragod Div. 118. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 127. 1988; Sanjappa, Legumes Ind. 104. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 269. 2009.

Slender creeping and climbing herbs, coarsely brown-tawny pubescent. Leaves alternate, 3-foliolate; leaflets 3-7 x 2-4 cm, elliptic-rhomboid, obtuse, base rounded or oblique, densely pubescent; lateral nerves 4 pairs; petioles 3-8 cm

long; stipels 3 mm long, subulate. Flowers bluish, in axillary racemes; bracts and bracteoles small caducous; pedicels to 3 m long. Calyx lobes unequal, 4-6 mm long, upper 2 connate, other 3 lobes linear lanceolate. Standard petal obovate, appendaged with 2 inflexed auricles; keel petals shorter than wing petals. Stamens 9+1. Ovary densely villous, sessile; ovules many, style slender, stigma capitate. Pods coarsely pubescent, 2-3 cm long, compressed-convex, slightly constricted between the seeds; seeds 5-7.

Kariyenkappu, *KJD 31831*

Fl. & Fr.: August-December

Distribution: Along the boundaries of forests as weed.

CENTROSEMA (A. P. de Candolle) Benth., *Comentat. Legum. Gener.* 53. 1837, *nom. cons.*

Centrosema molle Benth., *Comm. Legum. Gen.* 55. 1837; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 270. 2009. *Centrosema pubescens* auct. non Benth. 1837: Ansari, *Fl. Kasaragod Div.* 119. 1985; Sanjappa, *Legumes Ind.* 111. 1992. *Centrosema virginianum* auct. non (L.) Benth. 1838; Thoth. et al., *Curr. Sci.* 39:353.1970; Manilal & Sivar., *Fl. Calicut* 89. 1982; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 128. 1988. *Clitoria virginiana* L., *Sp. Pl.* 753. 1753.

Pubescent twiners. Leaves 3-foliolate; leaflets 3-6.2 x 1.5-4 cm, ovate or elliptic, apex acuminate, base rounded, the terminal larger than the laterals, pubescent; petiole to 5 cm long; stipules persistent. Racemes axillary, 5-8-flowered; peduncles 4-5 cm long. Flowers 2.5-3.2 cm long; pedicels 7-10 mm long; bracts connate, 5-8 mm long, ovate-lanceolate, deciduous; bracteoles 6-8 mm long, ovate. Calyx-tube 3-4 mm long, campanulate, 2-lipped, upper lip emarginate, adpressed tomentose. Corolla violet; standard c. 3 cm long, ovate-suborbicular, gibbous at the back above the claw, emarginate, pubescent without; wings falcate, the auricle curved back. Stamens 9+1. Style basally pubescent. Pods 7-12 x 0.4-0.6 cm, linear, compressed with 4-raised ribs near sutures; seeds 15-18, 4-6 mm long, oblong, brown with dark mottling.

Kariyenkappu, *KJD 18768*

Fl. & Fr.: September-January

Distribution: Common weed in plantations.

CROTALARIA L., *Sp. Pl.* 714.1753.

- 1a. Leaves simple 2
- 1b. Leaves 3-foliolate *C. pallida*
- 2a. Flowers bluish-white *C. heyneana*
- 2b. Flowers yellow 3
- 3a. Pods glabrous 4
- 3b. Pods hirsute *C. obtecta*
- 4a. Leaves acute at apex; stipules minute *C. spectabilis*
- 4b. Leaves obtuse at apex; stipules ovate acuminate, reflexed *C. retusa*

Crotalaria heyneana Graham ex Wight & Arn., *Prodr.* 187. 1834; Hook. f., *Fl. Brit. India* 2: 78. 1876; Gamble, *Fl. Pres. Madras* 297(210). 1918; Ansari, *Fl. Kasaragod Div.* 120. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 131. 1988; Sanjappa, *Legumes Ind.* 121. 1992; A.A. Ansari, *Crotalaria India* 265. 2008; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 273. 2009.

Erect shrubs; stem 3-angled, villous. Leaves simple, alternate, 9 x 7 cm, ovate, obtuse, cuneate at base, minutely hairy below; stipule 7 mm broad, semi-lunar. Raceme to 20 cm long, terminal; bracts deflexed. Flowers numerous; pedicels 6-7 mm long, bracteolate at middle. Calyx 8 mm long, lobes ovate, acuminate, thinly hairy. Petals white or bluish white; standard 12

x 8 mm, glabrous; wings 10 x 6 mm; keel glabrous. Pods 35 x 13 mm, minutely hispid, clawed.

55 Block, *KJD 26196*

Fl. & Fr.: September-December

Distribution: Fairly common along the boundaries near Farm. Endemic to southern Western Ghats

Crotalaria oblecta Graham ex Wight & Arn., Prodr. 185. 1834, **var. oblecta**; Hook. f., Fl. Brit. India 2: 79. 1876; Gamble, Fl. Pres. Madras 297(210). 1918; Sanjappa, Legumes Ind. 125. 1992; A.A. Ansari, Crotalaria India 119. 2008.

Shrubs. Leaves simple, alternate, 3.5-7 x 2-4 cm, elliptic ovate to obovate, obtuse at apex, cuneate at base, velvety below when young, sparsely hairy on ageing. Stipules 0.5-0.7 cm long, subulate, deciduous. Racemes many-flowered. Calyx 2-2.5 cm long, lobes 5, densely brown hairy. Petals yellow, 2-2.5 cm long; standard with few lines of brown hairs; wings with scaly folds; keels cottony on the inner margins. Stamens 10, linear, sagittate; sheath 0.8-1 cm long, filaments free, 0.8-1 cm long. Ovary 0.5-0.6 cm long, ovoid, densely brown hairy; style 2-2.3 cm long, incurved, brown silky; stigma hairy on inner side; ovules many. Pods 4-5 x 1.5-2 cm, oblong; seeds many, 0.4-0.5 cm diam., compressed.

Ambalappara, *NS & KJD 31947; KVB 31715*

Fl. & Fr.: December-March

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats

Crotalaria pallida Dryand. in Ait., Hort. Kew (ed. 1) 3: 20. 1789, **var. pallida**: Manilal & Sivar., Fl. Calicut 78. 1982; Ansari, Fl. Kasaragod Div. 121. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 132. 1988; Sanjappa, Legumes Ind. 126. 1992; A.A. Ansari, Crotalaria India 337. 2008; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 274. 2009. *Crotalaria mucronata* Desv., J. Bot. 3: 76. 1814. *Crotalaria striata* DC., Prodr. 2: 131. 1825; Hook. f., Fl. Brit. India 2: 84. 1876; Gamble, Fl. Pres. Madras 301(212). 1918. *Crotalaria striata* DC. **var. acutifolia** Trimen, Handb. Fl. Ceylon 2: 19. 1984.

Erect undershrubs, up to 1.6 cm tall; branches puberulous. Leaves 3-foliolate; leaflets subequal, 3-7 x 1.8-4 cm, obovate or elliptic-ovate, apex obtuse or acute, base cuneate, membranous, glaucous below; petiole 3-7 cm long; stipules 1-3 mm long, setaceous, deciduous. Flowers c. 1.3 cm long, in terminal many-flowered racemes, up to 25 cm long; pedicels 3-4 mm long; bracts to 3 mm long, subulate. Calyx 5-7 mm long, upper 2-lobes united, other lobes lanceolate, adpressed tomentose. Petals yellow with prominent reddish veins; standard c. 1.2 cm long, broadly elliptic; keels curved and beaked. Stamens 10, monadelphous. Style abruptly incurved at the base; stigma oblique. Pods 3-4.2 x 0.6-0.8 cm, oblong-cylindrical; seeds 18-30, brown.

Pookundu, *KJD 18800*

Fl. & Fr.: September-January

Distribution: Fairly common near water bodies.

Crotalaria retusa L., Sp. Pl. 715. 1753; Hook. f., Fl. Brit. India 2: 75. 1876; Gamble, Fl. Pres. Madras 293(207). 1918; Manilal & Sivar., Fl. Calicut 78. 1982; Ansari, Fl. Kasaragod Div. 122. 1985; Ramach. & V.J. Nair, Fl.

Cannanore Dist. 133. 1988; Sanjappa, Legumes Ind. 128. 1992; A.A. Ansari, *Crotalaria* India 275. 2008; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 275. 2009.

Erects herbs or subshrubs up to 1.75 m tall; branches striate, minutely pubescent. Leaves simple, alterenate, 2-8 x 1-3 cm, oblanceolate or obovate, apex obtuse or retuse, base cuneate, glabrous above, puberulent and glaucous below; stipules minute, subulate. Flowers in few to many-flowered terminal racemes; bracts 4-6 mm long, subulate. Calyx 0.8-1 cm long, puberulous without; lobes 5, broadly ovate, acuminate. Petals yellow with red striations; standard orbicular; wings with scaly folds; keels with a line of cottony hairs on inner margin. Staminal sheath 6-7 mm long; filaments 5-7 mm long. Ovary 0.8-1 cm long; ovules many; style 1-1.5 cm long; stigma pubescent. Pods 3-4 x 0.8-1 cm, oblong, cylindrical, slightly broader upwards; seeds 15-20, c. 3 mm long, light brown to black.

Uruppukunnu, *KJD* 26368

Fl. & Fr.: September-January

Distribution: Rare in Semi-Evergreen forests of Uruppukunnu.

Crotalaria spectabilis Roth, Nov. Pl. Sp. 341. 1821; Sanjappa, Legumes Ind. 130. 1992; A.A. Ansari, *Crotalaria* India 284. 2008. *Crotalaria sericea* Retz., Obs. Bot. 5: 26. 1788; Hook. f., Fl. Brit. India 2: 75. 1876; Gamble, Fl. Pres. Madras 293(207). 1918; Vajr., Fl. Palghat Dist. 153. 1990, non Burm. f. 1768. *Crotalaria leschenaultii* DC., Prodr. 2: 125. 1825; Hook. f., Fl. Brit. India 2: 76. 1876; Gamble, Fl. Pres. Madras 293(207). 1918; A.A. Ansari, *Crotalaria* India 270. 2008.

Erect biennial undershrubs up to 1.2 m tall with glabrous, furrowed branches. Leaves simple, subopposite, 5-15 cm long and variable in width, oblong-lanceolate, apex acute or subacute, mucronate, base cuneate, glabrous above, fine-silky beneath; petioles 1.6-3 mm long; stipules large, ovate-lanceolate, leafy, persistent. Flowers yellow with a purple tinge, borne in elongated 16-50 flowered terminal racemes 25-30 cm long; pedicels longer than the calyx with a large foliaceous ovate-acute bract at the base of each pedicel and a pair of minute bracts on each pedicel below the middle. Calyx 1.3 cm long, tube campanulate, upper teeth large, triangular, acute, c. 6 mm broad at the base, the lower 3 teeth smaller and less deeply cut, linear-lanceolate, acute. Petals yellow, standard broadly ovate with a strong midrib at the back. Fruit (pod) stalked, linear-oblong, 2.5-5 cm long glabrous; seeds 20-30.

Ambalappara, *KJD* 26311; *NS* & *KVB* 31429

Fl. & Fr.: November-January

Distribution: Fairly common in Grasslands of Ambalappara.

DALBERGIA L. f., Suppl. Pl. 52. 1781, *nom. cons.*

- 1a. Stamens isodiadelphous, 5 and 5 *D. lanceolaria*
1b. Stamens monadelphous, 9 or 10 *D. sissoides*

Dalbergia lanceolaria L. f., Suppl. Pl. 316. 1781, **ssp. lanceolaria**; Hook. f., Fl. Brit. India 2: 235. 1876; Gamble, Fl. Pres. Madras 383(270). 1918; Ansari, Fl. Kasaragod Div. 123. 1985; Sanjappa, Legumes Ind. 136. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 278. 2009.

Large trees. Leaves imparipinnate, 15-25 cm long; leaflets 13 or 15, to 4 x 2 cm, oblong-elliptic, apex emarginate, slightly coriaceous; petiole to 2 cm; petiolule

3-5 mm, stipules small, deciduous. Panicles terminal and axillary, 5-15 cm long. Calyx reddish-brown. Petals bluish-white. Pod 8 x 2 cm, oblong-lanceolate, glabrous, stipitate, coriaceous. acute at both ends; seeds 1-3.

Kariyenkappu, *KJD 18791*

Fl. & Fr.: January-December

Distribution: Occasional in Deciduous forests.

Dalbergia sissoides Graham ex Wight & Arn., Prodr. 1: 265. 1834; Hook. f., Fl. Brit. India 2: 231. 1870; Gamble, Fl. Pres. Madras 383(270). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 135. 1988; Sanjappa, Legumes Ind. 140. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 279. 2009. *Dalbergia latifolia* Roxb. var. *sissoides* (Graham ex Wight & Arn.) Baker in Hook.f., Fl. Brit. India 2: 231. 1876.

Deciduous trees, to 30 m high, bark 15-20 mm thick, surface grey to pale brown, smooth, exfoliations small, irregular; fibrous. Leaves imparipinnate, alternate; leaflets 5-11, alternate, 3-7.5 x 2-6 cm, elliptic-obovate, orbicular or obovate, apex acute, base cuneate or acute, obtuse or retuse, margin entire, membranous; stipules small, lateral, cauducous; rachis 5-15 cm, slender, pulvinate, glabrous; lateral nerves 4-12 pairs, pinnate, ascending, slender, prominent; intercostae reticulate, prominent. Flowers bisexual, white, 7-8 mm long, in loose terminal panicles. Calyx campanulate, glabrous; lobes 5, subequal. Petals 5; standard cuneate at base, reflexed; keel petals hastate. Stamens monadelphous, filaments alternately longer and shorter. Ovary stipitate, inferior, 1-celled, ovule 1-few; style slender; stigma capitate. Fruit a pod 5-7.5 x 1-1.2 cm, tapering to both ends, oblong, stipitate; seeds 2-4, reniform, pale brown.

Narikkadavu, *KJD 26358*

Fl. & Fr.: February-August

Distribution: Occasional in Deciduous forests.

DERRIS Loureiro, Fl. Cochinch. 2: 432. 1790, *nom. cons.*

1a. Pods oblong, turgid densely brown tomentose..... *D. brevipes*

1b. Pods narrow, not turgid, minutely tomentose.....*D. scandens*

Derris brevipes (Benth.) Baker in Hook. f., Fl. Brit. India 2: 244. 1878, **var. brevipes**; Gamble, Fl. Pres. Madras 388(273). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 136. 1988; Sanjappa, Legumes Ind. 144. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 281. 2009. *Derris heyneana* Benth. var. *brevipes* Benth., J. Linn. Soc. 4 (Suppl.): 110. 1860.

Stout climbers; branchlets slender, glabrous. Leaves 3-9-foliolate; leaflets to 12 x 5 cm, obovate-oblong, abruptly acuminate at apex, retuse, acute at base. Panicles 10 x 10 cm, axillary, rusty tomentose. Flowers 14 mm long. Calyx cupular, 4 mm long, hispid, black, lobes obtuse. Standard petal 11 x 7 mm, obovate, emarginate, white, clawed; wing 9 x 3 mm, oblong; keel glabrate. Stamens monadelphous. Ovary densely hairy. Pods 5 x 2.5 cm, ovate, obtuse at either ends, densely dark brown-hispid; seeds 2.

Ambalappara, *NS & KVB 31428*

Fl. & Fr.: February-December

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Western Ghats.

Derris scandens (Roxb.) Benth., J. Linn. Soc. Bot. 4 (Suppl.) 103. 1860; Hook. f., Fl. Brit. India 2: 240. 1878; Gamble, Fl. Pres. Madras 387(273). 1918; Manilal & Sivar., Fl. Calicut 81. 1982; Ansari, Fl. Kasaragod Div. 125. 1985; Sanjappa, Legumes Ind. 148. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 281.

2009. *Dalbergia scandens* Roxb., Pl. Corom. 2: 49, t. 192. 1805. *Brachypterum scandens* (Roxb.) Benth., Ann. Wiener Mus. Naturgesch. Vienna 2: 101. 1838; Sivar. & Mathew, Fl. Nilambur 223. 1997.

Large climbing shrubs; branchlets brown, lenticellate. Leaflets 5-11, 2-5 x 1-2.5 cm, elliptic, lanceolate or ovate-oblong, apex obtuse, acute, sometimes emarginate, base rounded to cuneate, subcoriaceous; lateral nerves 7-9 pairs, slender. Racemes axillary, 8-25 cm long, with flowers clustered on brown-pubescent rachis. Flowers 7-9 mm long; pedicels c. 4 mm long, slender. Calyx 2.5-3 mm long, shortly adpressed tomentose, lobes obscure. Petals pink or white; standard 7-8 mm long; ovate-orbicular. Stamens 10, alternate ones short. Pods 2.5-6.5 x 1-1.4 cm, oblong, narrowly winged on the upper suture, minutely adpressed tomentose; seeds 2-4 ca. 8 mm long, reniform, compressed, dark brown.

Kariyenkappu, *KJD* 18797

Fl. & Fr.: June-December

Distribution: Rare near Stream side.

DESMODIUM Desvaux, J. Bot. Agric. 1: 122. 1813, *nom. cons.*

- 1a. Leaves all simple..... 2
- 1b. Leaves 3-foliolate or upper unifoliolate..... 4
- 2a. Petiole broadly winged; stamens monadelphous*D. triquetrum*
- 2b. Petiole not winged; stamens diadelphous 3
- 3a. Leaves ovate-lanceolate, acute, glabrescent; calyx-lobes twice as long as calyx tube *D. gangeticum*
- 3b. Leaves broadly ovate-deltoid, obtuse or subacute, softly tomentose; calyx lobes more or less equal to calyx tube *D. velutinum*
- 4a. Trailing or diffuse herbs; leaflets less than 1 cm long *D. triflorum*
- 4b. Erect herbs or shrubs; leaflets more than 2 cm long 5
- 5a. Flowers in racemes, subtended by bifarious, orbicular, foliaceous bracts; pods 2-jointed *D. pulchellum*
- 5b. Flowers not subtended by foliaceous bracts; pods 4-9 jointed 6
- 6a. Flowers in short peduncled axillary umbels *D. triangulare*
- 6b. Flowers in elongated racemes 7
- 7a. Flowers orange-red; joints of pods crescent shaped *D. repandum*
- 7b. Flowers blue, pink or white; joints of pods not crescent shaped 8
- 8a. Joints of pod with sticky, hooked hairs *D. laxiflorum*
- 8b. Joints of pod without sticky, hooked hairs 9
- 9a. Joints of pods dehiscent along the lower suture *D. heterocarpon*
- 9b. Joints of pods indehiscent, breaking at joints *D. alysicarpoides*

Desmodium alysicarpoides van Meeuwen, Reinwardtia 6: 246. 1962; Sanjappa, Legumes Ind. 149. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 283. 2009. *Alysicarpus parviflorus* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 211. 1851; Gamble, Fl. Pres. Madras 339(240). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 125, non Mart. 1843. *Desmodium parviflorum* (Dalz.) Baker in Hook. f., Fl. Brit. India 2: 172. 1876, non Mart. & Galeotti 1843.

Erect or suberect herbs, to 30 cm high; stem villous. Leaflets 4.5 x 2 cm, elliptic acute at apex, rounded at base, tomentose below; laterals much smaller. Racemes to 30 cm long, terminal; pedicels 2 or 3-together. Flowers blue. Calyx 4.5 mm long, lobes linear-lanceolate, densely hairy. Standard petal 3 x 2.5 mm, glabrous. Pods curved, 6-jointed, joint 2 x 1.5 mm, straight along one suture, glabrous.

Ambalappara, *KJD* 26322

Fl. & Fr.: September-January

Distribution: Rare in Evergreen forests of Ambalappara.

Desmodium gangeticum (L.) DC., Prodr. 2: 327.1825; Hook. f., Fl. Brit. India 2:168.1876; Gamble, Fl. Pres. Madras 345(244). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 137. 1988; Sanjappa, Legumes Ind. 153. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 284. 2009. *Hedysarum gangeticum* L., Sp. Pl. 746. 1753. *Hedysarum collinum* Roxb., Fl. Ind. 3: 439. 1832.

Erect subshrubs, up to 1.2 m tall; stem angled, hairy when young, glabrescent on ageing. Leaves 1-foliolate, 5-10 x 1-5 cm, ovate to elliptic, apex acute, base rounded, glabrescent above, densely appressed hairy below, often blotched with grey; petiole to 2.5 cm long; stipules to 8 mm long; linear-lanceolate. Flowers white, fascicled in terminal and axillary, 15-25 cm long racemes; pedicels 3-4 mm long; bracts subulate. Calyx campanulate; lobes 1.5-2 mm long, triangular, tomentose without. Petals 4 mm across. Stamens diadelphous. Ovary 3-4 mm long, compressed, hairy without; stigma capitate. Pods 1.2-2.3 x 0.1-0.15 cm, moniliform, 4-7-jointed, reticulate, slightly pubescent with hooked hairs, constricted in ventral suture.

Valayamchal near Farm, *KJD 18799*

Fl. & Fr.: October-December

Distribution: Along the boundaries near Farm.

Desmodium heterocarpon (L.) DC., Prodr. 2: 337. 1825, **var. heterocarpon**; Ansari, Fl. Kasaragod Div. 126. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 137. 1988; Sanjappa, Legumes Ind. 154. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 800284 2009. *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. *Hedysarum polycarpum* Poir. in Lam., Encycl. 6: 431. 1805. *Desmodium polycarpum* (Poir.) DC., Prodr. 2: 334. 1825; Hook. f., Fl. Brit. India 2: 171. 1876; Gamble, Fl. Pres. Madras 346(244).1918. *Desmodium patens* Wight, Ic. t. 407. 1840.

Ascending undershrubs; root stock creeping; branches adpressed hairy. Leaves 3-foliolate; leaflets 1.5-4 x 1-2.2 cm, obovate or broadly elliptic-oblong, apex rounded or retuse, base obtuse, glabrous above, appressed-pubescent below; petiole to 2 cm long; stipules c. 5 mm long; subulate. Racemes terminal, paniced 2.5-4.5 cm long; densely covered with appressed straight hairs. Flowers 5-6 mm long; pedicels 3-5 mm long; bracts c. 3-4 mm long; lanceolate. Calyx-tube 2-2.5 mm long; 2 upper lobes connate, 3-lower narrower, acuminate, longer than tube. Flowers purple; standard petal 5-6 mm long; obovate-orbicular. Pods 1.2-2 x 0.3-0.4 cm, lower margin indented, upper straight, 5-7-jointed; joints about as broad as long.

Chelachode, *NS & KJD 31910*

Fl. & Fr.: October-December

Distribution: Fairly common in Evergreen forests of Chelachode and also along boundaries near Farm.

Desmodium laxiflorum DC., Ann. Sci. Nat. (Paris) 4: 100. 1825 & Prodr. 2: 335. 1825; Hook. f., Fl. Brit. India 2: 164. 1876; Gamble, Fl. Pres. Madras 344(243). 1918; Manilal & Sivar., Fl. Calicut 85. 1982; Ansari, Fl. Kasaragod Div. 127. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 138. 1988; Sanjappa, Legumes Ind. 156. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 284. 2009. *Desmodium recurvatum* (Roxb.) Graham ex Wight & Arn., Prodr. 226. 1834. *Hedysarum recurvatum* Roxb., Fl. Ind. 3: 358. 1832.

Erect herbs, to 35 cm high; stems angled, adpressed-hairy. Terminal leaflet to 13 x 10 cm, ovate, acute at apex, rounded at base, densely hairy

below, glabrate above; petiole 4 cm long; stipules 8 mm long, lanceolate; stipels filiform. Racemes to 35 cm long, axillary or terminal; rachis hairy. Flowers solitary or paired, pink. Calyx 2 mm long, hairy. Standard petal 6 x 3 mm, emarginate. Pods 6-9 jointed; joints 4 x 1.25 mm, oblong, longitudinally striate.

Narikkadavu, *KJD 26386*

Fl. & Fr.: September-January

Distribution: Rare in Seni-evergreen forests of Narikkadavu.

Desmodium pulchellum (L.) Benth., Fl. Hongk. 83. 1861; Hook. f., Fl. Brit. India 2: 162. 1876; Gamble, Fl. Pres. Madras 344(243). 1918; Sanjappa, Legumes Ind. 160. 1992; Ramach. & V.J. Nair, Fl. Cannanore Dist. 139. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 286. 2009. *Hedysarum pulchellum* L., Sp. Pl. 747. 1753. *Phyllodium pulchellum* (L.) Desv., J. Bot. ser. 2, 1: 124. 1813; Mohanan & Sivad., Fl. Agasthyamala 215. 2002.

Undershrubs or shrubs up to 2 m tall; branchlets downy-pubescent. Leaves 3-foliolate; leaflets 2.5-11 x 2-5 cm, ovate, elliptic or ovate-oblong, apex obtuse or subacute, base subacute, margins wavy, glabrescent and subrugose above, finely downy and pale beneath, thin-coriaceous, lateral less than half as long as the terminal, inequilateral; petiole to 2 cm long; stipules c. 5 mm long, ovate. Racemes terminal or axillary, 7-16 cm long; primary bracts 10-18, leafy, 1.2-1.5 x 1.2-1.5 cm, orbicular, each enclosing 1-5 flowers, stipellate; secondary bracts c. 1 mm long, ovate; bracteoles to 2 mm long. Calyx c. 2 mm long, puberulous, teeth lanceolate. Petals yellowish; standard 4-5 mm long, obovate; wings c. 4 mm long, elliptic. Pods 4-6 x 3-4 mm, indented on both sutures, sessile; joints usually 2, slightly longer than broad, pubescent; seeds orbicular.

Kannadivechakunnu, *KJD 22501*

Fl. & Fr.: September-February

Distribution: Rare in Evergreen forests of Kannadivechakunnu.

Desmodium repandum (Vahl) DC., Prodr. 2: 334. 1825; Ramach. & V.J. Nair, Fl. Cannanore Dist. 140. 1988; Sanjappa, Legumes Ind. 161. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 286. 2009. *Hedysarum repandum* Vahl, Symb. Bot. 2: 82. 1791. *Desmodium scalpe* DC., Prodr. 2: 334. 1825; Hook. f., Fl. Brit. India 2: 165. 1876; Gamble, Fl. Pres. Madras 345(243). 1918. *Desmodium strangulatum* Wight & Arn., Prodr. 228. 1834.

Undershrubs; branches slender. Leaves few; leaflets to 20 x 6 cm, ovate, acuminate, rounded at base, glabrous above, adpressed pubescent below; nerves finely reticulated below; stipules ovate, acuminate. Flowers in paniced racemes, terminal or axillary; rachis tomentose, to 25 cm long. Calyx 4-lobed, campanulate. Standard petal to 10 mm across, reddish, orbicular, retuse at apex. Joints of pod 2 or 3, to 1.5 x 0.6 cm, falcate, densely covered with hooked hairs.

Ambalappara, *KJD 26336*

Fl. & Fr.: December-April

Distribution: Common in Evergreen forests of Ambalappara and Pothurumi.

Desmodium triangulare (Retz.) Merr., J. Arnold Arbor. 23: 170. 1942; Ansari, Fl. Kasaragod Div. 127. 1985; Sanjappa, Legumes Ind. 162. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 287. 2009. *Hedysarum triangulare* Retz., Obs. Bot. 3: 40. 1783. *Desmodium cephalotes* (Roxb.) Wall. ex Wight & Arn., Prodr. 224.

1834; Hook. f., Fl. Brit. India 2: 161. 1876; Gamble, Fl. Pres. Madras 344(242). 1918. *Desmodium triangulare* (Retz.) Merr. var. *congestum* (Prain) Sant., Kew Bull. 1948: 276. 1948; Ramach. & V.J. Nair, Fl. Cannanore Dist. 140. 1988.

Shrubs; branchlets triangular, adpressed hairy. Leaflets subequal, to 9 x 4 cm, elliptic, acuminate, hairy when young; nerves 8-10 pairs, regular; petiole 3 mm long; stipules 1 cm long, ovate, acuminate. Flowers many-together, in axillary clusters. Upper calyx lobes united and longer than the others. Petals white; standard to 8 mm across, orbicular, glabrous; wings 6 mm long, obovate; keels glabrous. Pods to 2.5 cm long, curved, crenate; joints 4-6, adpressed tomentose.

Kariyenkappu, NS & KJD 31561

Fl. & Fr.: September-January

Distribution: Rare in Plantations of Kariyenkappu.

Desmodium triflorum (L.) DC., Prodr. 2: 334. 1825; Hook. f., Fl. Brit. India 2: 173. 1876; Gamble, Fl. Pres. Madras 347(245). 1918; Manilal & Sivar., Fl. Calicut 84. 1982; Ansari, Fl. Kasaragod Div. 128. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 140. 1988; Sanjappa, Legumes Ind. 163. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 287. 2009. *Hedysarum triflorum* L., Sp. Pl. 249. 1753. *Desmodium triflorum* (L.) DC. var. *minus* Wight & Arn., Prodr. 229. 1834.

Much branched glabrescent prostrate herbs, rooting at nodes. Leaves 3-foliolate; leaflets 0.3-1.5 x 0.3-1.4 cm, obovate, base cuneate, apex truncate or emarginate, lateral leaflets smaller than the terminal one; petiole 1.5 cm long; stipule c. 5 mm long, ovate-lanceolate. Flowers 3-4 mm long, 1-4 together in the axils of leaves; pedicels 4-6 mm long, capillary; bracts c. 2 mm long, ovate, ciliate. Calyx c. 3 mm long, covered with long silky hairs; lobes unequal, lanceolate. Petals pink to violet; standard c. 3 mm long, obovate; wings c. 2 mm long; keels to 4 mm long. Pods 1-1.5 cm long, 3-5-jointed, lower margin deeply indented, upper entire; joints hairy or glabrous, reticulate-veined, longer than broad.

Valayamchal, KJD 18724

Fl. & Fr.: July-December

Distribution: Along boundaries near Farm.

Desmodium triquetrum (L.) DC., Prodr. 2: 326. 1825; Hook. f., Fl. Brit. India 2: 163. 1876, p.p.; Gamble, Fl. Pres. Madras 345(244). 1918; Manilal & Sivar., Fl. Calicut 85. 1982; Ansari, Fl. Kasaragod Div. 128. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 141. 1988; Sanjappa, Legumes Ind. 163. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 288. 2009. *Hedysarum triquetrum* L., Sp. Pl. 746. 1753. *Tadehagi triquetrum* (L.) Ohashi, Ginkgoana 1: 290. 1973.

Erect subshrubs to 1 m tall; branches trigonous, ciliate with stiff hairs on angles. Leaves 1-foliolate, 5-15 x 1.5-4 cm, ovate-lanceolate or oblong, apex acuminate, base subcordate, glabrous above and tomentose below; petiole to 3.5 cm long; stipules 1-1.8 x 0.4-0.5 cm, subulate at apex, striated. Racemes terminal, 10-28 cm long; bracts 3-6 x 3-5 mm, subulate; pedicels 4-6 mm long. Calyx c. 4 mm long, campanulate; lobes lanceolate, acuminate. Petals pink. Stamens monadelphous. Ovary 3-4 mm long, pubescent without; style curved; stigma capitate. Pods 1.8-3.5 x 0.5-0.7 cm, laterally compressed, 5-7-jointed, loosely appressed hairy.

Paripode, KJD 26351

Fl. & Fr.: July-December

Distribution: Along boundaries near Farm at Paripode.

Desmodium velutinum (Willd.) DC., Prodr. 2: 328. 1825; Sanjappa, Legumes Ind. 165. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 288. 2009. *Hedysarum velutinum* Willd., Sp. Pl. 3: 1174. 1802. *Desmodium latifolium* (Roxb. ex Ker.) DC., Prodr. 2: 328. 1825; Hook. f., Fl. Brit. India 2: 168. 1876; Gamble, Fl. Pres. Madras 346(244). 1918. *Hedysarum latifolium* Roxb. ex Ker., Bot. Reg. 5: t. 355. 1819.

Shrubs, to 1.5 m high; stem ferruginous-tomentose. Leaves to 13 x 10 cm, broadly ovate, acute or obtuse at apex, rounded at base, densely velutinous below; nerves 6-8 pairs, regular, prominent below; stipules 3 mm long, cordate at base, white; stipel minute, filiform. Raceme terminal, panicked, to 30 cm long. Flowers 4 mm across, pink. Calyx 1.5 mm long, lobes ovate, acute, hairy. Standard petal 3 x 3 mm. Pods 2 cm long, crenate along ventral suture; joints 8-10, each 3 x 3 mm, roundish, hirsute

Paripode, *KJD 26352*

Fl. & Fr.: October-February

Distribution: Along boundaries near Farm at Paripode.

ERYTHRINA L., Sp. Pl. 706. 1753.

1a. Wing and keel petals about equal in length; keel petals free *E. variegata*

1b. Keel petal is larger than wing petals; keel petals combined *E. stricta*

Erythrina stricta Roxb., Fl. Ind. 3: 251. 1832; Hook. f., Fl. Brit. India 2: 189. 1876; Gamble, Fl. Pres. Madras 354(250). 1918; Sanjappa, Legumes Ind. 173. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 290. 2009.

Trees, to 15 m high, bark 10-20 mm thick, surface yellowish, vertically fissured, armed with bossed prickles; outer bark corky, stratified, inner bark thin fibrous; branchlets apically stellate-pubescent, basally glabrescent, densely prickled. Leaves trifoliate, alternate, leaflets 5-12.5 x 3.7-10 cm, deltoid, truncate or obtuse, apex subacute or acuminate, margin entire, glabrous, membranous; stipules small, lateral; rachis 10-13 cm long, slender, glabrous, pulvinate, prickled or not; stipels gland-like; petiolule 5-10 mm long, slender, glabrous; nerves 3-7 from base, palmate, lateral nerves 5-7, pinnate, prominent, intercostae reticulate, prominent. Flowers bisexual, 5 x 1.8 cm, red, clustered on the brown-tomentose rachis, in terminal racemes; bracts ovate; bracteole 3 mm; pedicel 3 in a cluster, to 8 mm. Calyx spathaceous, 1-1.5 cm, split half way down, glabrous, erect; corolla deep red. Petals 5; standard 5 x 2.5 cm, oblong-lanceolate; wings 5.5 x 3 mm, obovate; keel 2 x 0.7 cm, ovate. Stamens 10, monadelphous, vexillary filament free; staminal sheath 2.5 cm; filaments 1 and 1.5 cm long; anthers uniform. Ovary inferior, stipitate, 2 cm, pubescent, 1-celled, ovules many; style 1.5 cm, suberect; stigma capitate. Fruit a pod, 5-10 cm long, lanceolate; seeds 3-6, black.

Kariyenkappu, *KJD 26370*

Fl. & Fr.: January-May

Distribution: Rare in Plantations of Kariyenkappu and Evergreen forests of Moonamthode.

Erythrina variegata L. in Stickman, Herb. Amboin. 10. 1754; Sanjappa, Legumes Ind. 173. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 291. 2009. *Erythrina variegata* L. var. *orientalis* (L.) Merr., Interpr. Herb. Amboin. 276. 1917; Manilal & Sivar., Fl. Calicut 90. 1982; Sanjappa, Legumes Ind. 173. 1992; Sunil & Sivadasan, Fl. Alappuzha Dist. 224. 2009. *Erythrina indica*

Lam., Encycl. 2: 391. 1786; Hook. f., Fl. Brit. India 2: 188. 1876; Gamble, Fl. Pres. Madras 353(249). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 142. 1988.

Deciduous trees; bark yellowish or greenish-grey, smooth, peeling off in papery flakes; prickles black on branches, falling after a few years. Leaves trifoliolate, alternate, leaflet 10-13.5 x 8.5-12.5 cm, widely ovate, rhomboid or deltoid-ovate, apex acuminate, base truncate or obtuse, margin entire, glabrous, membranous; stipules small, lateral; rachis 17-21 cm, slender, pulvinate, glabrous; stipels gland-like; petiolule 7-10 mm, stout, glabrous; 3 ribbed from base; lateral nerves 4-7 pairs, pinnate, prominent, ascending, intercostae reticulate, faint. Flowers bisexual, bright red, in dense racemes. Calyx spathaceous, oblique, recurved, split to the base on one side, 5-toothed at the tip. Petals 5, sessile; standard 6.5x2.5 cm, oblong-elliptic, apex obtuse; wings 1.5 x 1 cm, obovate; keel 1.5 x 1.7 cm, oblong-falcate, free. Stamens 10, monadelphous, alternately longer and shorter, vexillary filament free; anthers uniform. Ovary stipitate, inferior, pubescent, 1-celled, ovules many; style curved, subulate at the apex, not bearded; stigma capitate. Fruit a pod 15-30.5 cm long, torulose, constricted between seeds, dehiscent; seeds 6-8.

Kariyenkappu, KJD 26387

Fl. & Fr.: January-May

Distribution: In earlier settlements at Kariyenkappu.

FLEMINGIA Roxb. ex W. Aiton et E. T. Aiton, Hortus Kew. ed. 2, 4: 349. 1812, *nom. cons.*

1a. Leaves unifoliolate; flowers within the persistent floral bracts..... *F. strobilifera*

1. Leaves 3-foliolate; flowers exposed from the floral bracts..... *F. macrophylla*

Flemingia macrophylla (Willd.) Prain ex Merr., Philipp. J. Sci. 5: 130. 1910; Manilal & Sivar., Fl. Calicut 91. 1982; Sanjappa, Legumes Ind. 176. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 292. 2009. *Crotalaria macrophylla* Willd., Sp. Pl. 3: 982. 1802. *Flemingia congesta* Roxb. ex Ait.f., Hort. Kew (ed. 2) 4: 349. 1812; Hook. f., Fl. Brit. India 2: 228. 1876; Gamble, Fl. Pres. Madras 378(267). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 144. 1988. *Moghania macrophylla* (Willd.) O. Ktze., Rev. Gen. Pl. 1: 199. 1891. *Flemingia semialata* Roxb., Fl. Ind. 3: 340. 1832; Gamble, Fl. Pres. Madras 378(267). 1918; Sanjappa, Legumes Ind. 178. 1992; Sunil & Sivadasan, Fl. Alappuzha Dist. 225. 2009. *Flemingia congesta* Roxb. ex Ait.f. *var. semialata* (Roxb.) Baker in Hook.f., Fl. Brit. India 2: 229. 1876, p.p. *Moghania prostrata* (Roxb.) Mukerjee, Bull. Bot. Soc. Bengal 6: 19. 1953.

Erect shrubs; branchlets trigonous, adpressed tomentose. Leaflets subequal, 5-14 x 2-5 cm, elliptic-lanceolate, base cuneate to rounded, apex acute to acuminate, tomentose along the nerves on both surfaces or glabrescent above, basally 3-nerved; petiole to 7 cm long, narrowly winged. Racemes axillary, clustered or single, 2.5-5.5 cm long, villous. Flowers 7-10 mm long; pedicels c. 2 mm long; bracts 4-7 mm long, lanceolate. Calyx lobes linear-lanceolate, the lower longest, much exceeding the tube, pubescent. Petals reddish; standard 7-8 mm long, oblong-obovate; wings and keels long-clawed. Pods 0.8-1.2 x 0.4-0.6 cm, oblong, turgid, covered with powdery red coating.

Kannadivechakunnu, KJD 26338

Fl. & Fr.: November-January

Distribution: Fairly common in Evergreen forests of Kannadivechakunnu.

Flemingia strobilifera (L.) R. Br. ex Ait.f., Hort. Kew (ed. 2) 4: 350. 1812; Hook. f., Fl. Brit. India 2: 227. 1876; Gamble, Fl. Pres. Madras 377(266). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 144. 1988; Sanjappa, Legumes Ind. 178. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 293. 2009. *Hedysarum strobiliferum* L., Sp. Pl. 746. 1753. *Hedysarum bracteatum* Roxb., Fl. Ind. 3: 351. 1832. *Flemingia bracteata* (Roxb.) Wight, Ic. t. 268. 1840; Gamble, Fl. Pres. Madras 378(266). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 143. 1988; Anil Kumar et al., Fl. Pathanamthitta 179. 2005. *Flemingia strobilifera* (L.) R. Br. ex Ait.f. var. *bracteata* (Roxb.) Baker in Hook.f., Fl. Brit. India 2:227.1876.

Erect shrubs, upto 1 m tall; branchlets tomentose. Leaves 1-foliolate, 6-15 x 2.5-7 cm, ovate, elliptic to broadly lanceolate, apex acute to acuminate, base broadly cuneate or rounded, glabrous above, pubescent or hairy on the nerves beneath; lateral nerves 5 or 6 pairs; petiole 1-1.5 cm long, tomentose; stipules to 1 cm long, linear-lanceolate, scarious. Racemes axillary and terminal, simple or branched, flexuous, tomentose; bracts to 2 x 2.5 cm, ovate-cordate, folded, membranous, each enclosing short few-flowered cymes. Flowers 1 cm long; pedicels c. 2 mm long. Calyx-tube c. 2 mm long; lobes 6-7 mm long, lanceolate. Petals white; standard 6-7 mm long, oblong-obovate; wings oblanceolate; keels obliquely oblong. Pods enclosed by the bracts. 6-10 x 4-0.6 cm, oblong, pubescent.

Kannadivechakuunu, KJD 26332

Fl. & Fr.: November-February

Distribution: Fairly common in Evergreen forests of Kannadivechakuunu.

INDIGOFERA L., Sp. Pl. 751. 1753.

- 1a. Pods oblong or subglobose, 2 or 3 seeded *I. linnaei*
 1b. Pods linear, more than 6 seeded *I. endecaphylla*

Indigofera endecaphylla Jacq. Ic. Pl. Rar. 3: t.570. 1789, "hendecaphylla"; Hook. f., Fl. Brit. India 2: 98. 1876; Gamble, Fl. Pres. Madras 311(220). 1918; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 295. 2009. *Indigofera spicata* auct. non Forssk. 1775: Ramach. & V.J. Nair, Fl. Cannanore Dist. 147. 1988; Sanjappa, Legumes Ind. 195. 1992; Sanjappa in Hajra et. al., Fasc. Fl. India 21: 123. 1995.

Undershrubs. Leaves 4 cm long; leaflets 8-10 pairs, 20 x 6 mm, oblanceolate, obtuse, shortly mucronate, sessile; stipules 1 cm long, subulate. Racemes 12 cm long, slender. Flowers 6 mm long. Calyx lobes subulate; standard pink, hispid outside. Pods 20 x 2 mm, compressed, marginate, rugose, seeds 5-10.

Paripode, KJD 26400

Fl. & Fr.: September-January

Distribution: Rare along the boundaries of Farm.

Indigofera linnaei Ali, Bot. Not. 111:549. 1958; Manilal & Sivar., Fl. Calicut 88. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 147. 1988; Sanjappa, Legumes Ind. 192. 1992 & in Hajra et. al., Fasc. Fl. India 21: 96. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 296. 2009. *Indigofera enneaphylla* L., Mant. Pl. 2: 272. 1771, *nom. illeg.*; Hook. f., Fl. Brit. India 2: 94. 1876; Gamble, Fl. Pres. Madras 309(218). 1918.

Trailing, branched, slender annual or perennial herbs with woody rootstock, sparsely grey-pubescent. Leaves imparipinnate; leaflets 5-9, subsessile, 3-8 x 2-4 mm,

oblong-obovate, apex obtuse to emarginate, base cuneate, appressed pubescent on both surfaces; stipules c. 3 mm long, ovate, cuspidate, scarious. Flowers 3-4.5 mm long, in 10-15-flowered axillary subcapitate racemes, 1-1.5 cm long; bracts c. 2 mm long, deltoid, hyaline. Calyx-tube c.1 mm long; lobes 2-3 mm long, setaceous. Petals exserted, red; standard obovate; wings and keels oblong. Staminal sheath to 3 mm; style apically incurved. Pods 3-4 x 1.5-2.5 mm, oblong-cylindrical or subglobose, adpressed hairy; seeds 2.

Ambalappara, *KJD 25572*

Fl. & Fr.: September-December

Distribution: Rare in Grasslands of Ambalappara.

KUNSTLERIA Prain in King, J. Asiat. Soc. Bengal Pt. 2. Nat. Hist. 66(2): 109. 1897.

Kunstleria keralensis C.N. Mohanan & N.C. Nair, Proc. Indian Acad. Sci. (Pl. Sci.) 90: 207. 1981; Sanjappa, Legumes Ind. 199. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 297. 2009.

Large climbers; stems slender. Leaves imparipinnate; leaflets opposite, 9-11 to 16 x 5 cm, ovate-oblong, acuminate, rounded at base, membranous; nerves 4 pairs, reticulate; rachis to 25 cm long. Flowers in terminal and axillary panicles, branches slender, rusty tomentose; bracts and bracteoles minute. Flowers distantly packed. Calyx 3 mm long, campanulate, rusty tomentose. Petals brownish, 5 mm across; standard orbicular, glabrous. Stamens 9 + 1; anthers uniform. Ovary sessile, few-ovuled. Pods 11 x 2 cm, flat, oblong obtuse, prominently reticulate; seed 1, oblong.

Kattikari, *KJD 25581*

Fl. & Fr.: April-June

Distribution: Rare in Evergreen forests of Kattikari and Moonamthode. Endemic to southern Western Ghats of Kerala. Conservation status: Vulnerablae.

MUCUNA Adanson, Fam. 2: 325, 579. 1763, *nom.cons.*

Mucuna pruriens (L.) DC., Prodr. 2: 405. 1825, **var. pruriens**; Hook. f., Fl. Brit. India 2: 187. 1876; Manilal & Sivar., Fl. Calicut 92. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 149. 1988; Sanjappa, Legumes Ind. 217. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 298. 2009. *Dolichos pruriens* L. in Stickman, Herb. Amboin. 23. 1754 & Syst. Nat. (ed. 10) 1162. 1759. *Stizolobium pruriens* (L.) Medik., Vorels. Churpfalz. Phys.-Ocon. Ges. 2: 339. 1787; Ansari, Fl. Kasaragod Div. 134. 1985. *Mucuna prurita* Hook., Bot. Misc. 2: 348. 1831; Gamble, Fl. Pres. Madras 356(251). 1918.

Large climbers; branchlets densely clothed with rigid hairs. Leaves 3-foliolate; leaflets 5-13x 2.5-8 cm, the terminal leaflets ovate-rhomboid or elliptic, the lateral ones broadly ovate, apex obtuse or acute, base rounded or truncate, adpressed pubescent; petiole to 10 cm long; stipules c. 4 mm long, linear; stipels setaceous. Flowers c. 3.5 cm long, in axillary tomentose, pendulous racemes; pedicels 2-4 mm long. Calyx-tube 4-7 mm long, pubescent, 4-lobed. Petals dark purplish; standard 2-2.5 x 1.5-2 cm, ovate. Anthers dimorphous, alternately dorsifixed and basifixed. Pods 5-7.5 x 1.2-1.5 cm, linear-oblong, somewhat s-shaped, turgid, densely covered with shining irritant bristly hairs; seeds 4-6, to 8 x 7 mm, ovoid, brown or black.

Kariyenkappu, *KJD 26254*

Fl. & Fr.: October-February

Distribution: Fairly common in Plantations.

PONGAMIA Ventenats, Jard. Malm. t. 28. 1803 *nom. cons.*

Pongamia pinnata (L.) Pierre, Fl. Forest. Cochinch. sub. t. 385. 1899; Manilal & Sivar., Fl. Calicut 79. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 151. 1988; Sanjappa, Legumes Ind. 230. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 300. 2009. *Cytisus pinnatus* L., Sp. Pl. 741. 1753. *Pongamia glabra* Vent., Jard. Malm. 28. t.28.1803; Hook. f., Fl. Brit. India 2:240.1876; Gamble, Fl. Pres. Madras 385(272). 1918. *Derris indica* (Lam.) Bennet, Journ. Bombay Nat. Hist. Soc. 68. 303. 1971; Ansari, Fl. Kasaragod Div. 125. 1985; *Galedupa indica* Lam., Encycl. 2:594.1788.

Evergreen trees, to 18 m high, bark 10-12 mm thick, surface grey, smooth, speckled with brown; branchlets lenticellate. Leaves imparipinnate, alternate, leaflets 5-7, opposite, estipellate; petiolule 6-10 mm; slender, pubescent; leaflet 4.5-12 x 2-7 cm, elliptic-acuminate, elliptic-lanceolate, ovate or ovate-oblong, apex acuminate, margin entire, glabrous, chartaceous; stipules lateral, small, oblong, cauducous; rachis 10-15 cm long, slender, pulvinate, pubescent; lateral nerves 5-8 pairs, pinnate, ascending, slender, faint; intercostae reticulate, obscure. Flowers bisexual, purplish-white, 15-18 mm long, in lax axillary racemes, axis pubescent; bracts small, cauducous. Calyx tube campanulate; minutely 5 toothed, apex truncate; corolla exserted. Petals 5, clawed; standard suborbicular with curved folds above the claw; wings obliquely oblong, slightly adnate above the claws to the obtuse keel petals which are joined near the tip. Stamens 10, monadelphous, the vexillary stamen free below and above; anthers uniform. Ovary subsessile, inferior, 1-celled, ovules 2; style in curved, beardless; stigma capitate. Fruit a pod, 4-5 x 2-2.5 cm, obliquely oblong, flat, thick, pointed at both ends, indehiscent, slightly falcate; seed one, reniform.

Kariyenkappu, *KJD 26379*

Fl. & Fr.: April-December

Distribution: Planted in the Sanctuary.

PSEUDARTHRIA R. Wight & Arnott, Prodr. 209. 1834

Pseudarthria viscida (L.) Wight & Arn., Prodr. 209. 1834; Hook. f., Fl. Brit. India 2: 154. 1876; Gamble, Fl. Pres. Madras 334(236). 1918; Ansari, Fl. Kasaragod Div. 131. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 151. 1988; Sanjappa, Legumes Ind. 230. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 301. 2009. *Hedysarum viscidum* L., Sp. Pl. 747. 1753.

Viscid pubescent subshrubs up to 75 cm tall. Leaves 3-foliolate; terminal leaflet 5-8 x 4-6 cm, ovate-rhomboid; laterals 3-4 x 2-3.5 cm, obliquely ovate, apex acute, base cuneate or obtuse, glabrescent above and densely woolly below; petioles 4-6 cm long; stipules 5-6 mm long, subulate. Flowers in axillary or terminal, often branched racemes; bracts and bracteoles 4-5 mm long, subulate, hairy. Calyx-tube 1-1.5 mm long; lobes 2-3 mm long, subulate, hairy. Corolla purplish; standard 4-5 mm long, ovate-obtuse. Stamens 9+1; staminal sheath c. 4 mm long. Ovary 3.5-4 mm long, terete, densely pubescent without; style subulate, incurved; stigma capitate. Pods 1-2 x 0.4-0.5 cm, linear-oblong, compressed, pubescent with hooked hairs; seeds 4-6, reniform.

Paripode, *KJD 26291*

Fl. & Fr.: November-March

Distribution: Rare along the boundaries of Farm.

PTEROCARPUS N J Jacquin, Sel. Strip. Amer. Hist. 283. 1763, *nom. cons.*

Pterocarpus marsupium Roxb., Pl. Corom. t. 116. 1799; Hook. f., Fl. Brit. India 2: 239. 1876; Gamble, Fl. Pres. Madras 385(271). 1918; Ansari, Fl. Kasaragod Div. 132. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 152. 1988; Sanjappa, Legumes Ind. 232. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 301. 2009.

Deciduous trees, to 30 m high, bark 10-15 mm, surface grey or greyish-black, rough, deeply vertically cracked, exfoliations small, irregular, fibrous; exudation blood-red. Leaves imparipinnate, alternate, leaflets 5-7, alternate, stipulate, 3.5-12.5 x 2-7 cm, elliptic-oblong, oblong-ovate or oblong, apex obtuse and emarginate, base obtuse or acute, margin entire, glabrous, coriaceous; stipules small, lateral, cauducous; rachis 6.5-11.1 cm long, slender, pulvinate, glabrous; petiolule 6-10 mm, slender, glabrous; lateral nerves 9-20 pairs, parallel, prominent, ascending, secondary laterals prominent; intercostae reticulate, prominent. Flowers bisexual, yellow, in terminal and axillary panicles; 10-12 mm long; bracts small, dioecious; bracteoles 2, cauducous. Calyx tube campanulate, lobes short, the upper 2 often connate; corolla exserted. Petals 5, all long-clawed, crisped along the margins; standard orbicular, wings oblique, obovate, auricled; keel petals oblique, small, slightly connate. Stamens 10, monadelphous; filaments subequal; anthers uniform. Ovary shortly stalked, inferior, tomentose, 1-celled, ovules 2; style filiform, in curved, beardless; stigma capitate. Fruit a pod, 2.5-5 cm across, orbicular-reniform, broadly winged; seed one, subreniform.

Narikkadavu, *KJD 26295*

Fl. & Fr.: September-October

Distribution: Rare in Deciduous forests.

RHYNCHOSIA Loureiro, Fl. Cochinch. 425, 460. 1790, *nom. cons.*

Rhynchosia rufescens (Willd.) DC., Prodr. 2: 387. 1825; Hook. f., Fl. Brit. India 2: 220. 1876; Gamble, Fl. Pres. Madras 373(263). 1918; Manilal & Sivar., Fl. Calicut 91. 1982; Sanjappa, Legumes Ind. 240. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 304. 2009. *Glycine rufescens* Willd., Ges. Naturf. Freunde Berlin Neue Schriften 4:222. 1803.

Subshrubs with trailing branches, glandular-hairy. Leaflets 6.5 x 2.5 cm, ovate, acute, rounded at base; petiole 4-5 cm long; stipules ovate. Flowers in short racemes. Calyx 8 mm long, lobes oblong, obtuse. Petals included, yellow; standard 7 mm diam., orbicular, glabrous; wings 5 mm long, oblong. Pods 7 x 5 mm, ovoid, turgid, minutely hispid; seed-1, black.

Ambalappara, *KJD 22581*

Fl. & Fr.: October-December

Distribution: Rare in Evergreen forests of Ambalappara.

SHUTERIA R. Wight & Arnott, Prodr. 207. 1834, *nom. cons.*

Shuteria involucrata (Wall.) Wight & Arn., Prodr. 207. 1834; Sanjappa, Legumes Ind. 245. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 305. 2009. *Glycine involucrata* Wall., Pl. Asiat. Rar. 3: 22. t. 241. 1832. *Glycine involucrata* Wall. var. *glabrata* (Wight & Arn.) Ohashi, J. Jap. Bot. 50: 305. 1975. *Shuteria glabrata* Wight & Arn., Prodr. 207. 1834. *Shuteria vestita* Wight & Arn., Prodr. 207. 1834; Hook. f., Fl. Brit. India 2: 181. 1876; Gamble, Fl.

Pres. Madras 350(247). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 153. 1988; Sanjappa, Legumes Ind. 245. 1992.

Slender twiners, stem villous. Leaves 3-foliolate, leaflets unequal, 3-4.5 x 2-2.5 cm, ovate, apex obtuse, base rounded, chartaceous, villous; petiole to 6 cm long, stipules lanceolate, striate with a tuft of hairs at base. Racemes to 20 cm long, axillary; bracts and bracteoles similar. Flowers many, white, deflexed. Calyx 4 mm long, lobes acuminate. Petals white, standard 7 x 5 mm, orbicular, wings 8 mm long, spurred at base, keel 8 x 3 mm, oblong. Stamens 9 + 1. Ovary many-ovuled, densely hairy. Pods to 4 x 0.5 cm, oblong, flat, densely hispid; seeds many, cubical.

Moonamthode, *KJD 22512*

Fl. & Fr.: November-February

Distribution: Rare in Evergreen forests of Moonamthode.

SMITHIA W Aiton, Hortus Kew. 3: 496. 1789, *nom. cons.*

Smithia gracilis Benth., Linnaea 24: 642. 1851; Hook. f., Fl. Brit. India 2: 150. 1876; Gamble, Fl. Pres. Madras 330(233). 1918; Sanjappa, Legumes Ind. 247. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 306. 2009.

Small prostrate herbs. Leaflets 3 pairs, 0.3-0.5 x 0.1-0.2 cm, elliptic ovate, ciliate on margins and midrib below. Racemes axillary and terminal, few-flowered; bracts minute, 0.2 cm long, membranous, ovate lanceolate. Calyx 0.4 cm long, 2-lipped, upper lip broad, lower 3-lobed, central lobe acuminate, ciliate on margins. Petals yellow, 0.4 cm long. Ovary curled. Pod 3-4 jointed, joints 0.3-0.4 cm diameter, twisted; seeds 1 mm diameter.

Ambalappara, *KJD 22518*

Fl. & Fr.: December-March

Distribution: Rare in open areas in Evergreen forests of Ambalappara.

Endemic to southern Western Ghats.

SPATHOLOBUS Hasskarl, Flora 25(2): 52. 1842.

1a. Flowers bluish-purple; pods sessile. *S. purpureus*
1b. Flowers yellowish-pink; pods stalked. *S. parviflorus*

Spatholobus parviflorus (Roxb. ex DC.) O. Ktze., Rev. Gen. Pl. 1: 205. 1891; Sanjappa, Legumes Ind. 251. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 308. 2009. *Butea parviflora* Roxb. ex DC., Prodr. 2: 415. 1825; Manilal & Sivar., Fl. Calicut 90. 1982; Anil Kumar et al., Fl. Pathanamthitta 159. 2005. *Spatholobus roxburghii* Benth. in Miq., Pl. Jungh. 238. 1852; Hook. f., Fl. Brit. India 2: 193. 1876; Gamble, Fl. Pres. Madras 358(253). 1918.

Large climbers; branches puberulus. Leaflets ovate, obtusely acute at apex, rounded at base, densely hairy below; lateral nerves 8 pairs; nervules parallel; petiole 3-6 cm long. Panicles 20 x 15 cm, axillary, densely hispid. Flowers 9 mm long, 8 mm across. Calyx 4 mm long, densely villous inside. Standard petal 8 x 6 mm, labrous, pale-pink; wings 6 mm long, long-clawed; keel 9 mm long, obovoid. Pods 14 x 4.5 cm, stalked; stalk ca 3 cm long.

Paripode, *KJD 22520*

Fl. & Fr.: September-April

Distribution: Fairly common in Deciduous forests.

Spatholobus purpureus Benth. ex Baker in Hook.f., Fl. Brit. India 2: 194. 1876; Gamble, Fl. Pres. Madras 359(253). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 155. 1988; Sanjappa, Legumes Ind. 252. 1992; Ratheesh

Narayanan, Fl. Stud. Wayanad Dist. 308. 2009. *Butea purpurea* (Benth. ex Baker) Blatt., J. Indian Bot. Soc. 8: 137. 1929.

Large climbers; stems puberulus. Leaflets ovate-oblong, abruptly acuminate, rounded at base, glabrous, lateral nerves 6 pairs, regular; petiole 7 cm long. Panicles 18 x 10 cm, terminal, rusty puberulus; pedicels 4 mm long, slender. Flowers many, light pink. Calyx 2.5 mm long, lobes obtuse. Standard petal 8 x 5 mm, obovate; wings 6 mm long, slightly pubescent; keel glabrous. Pods 10 x 2.5 cm, oblong, narrowed at both ends, compressed and thin.

Kariyenkappu, 31604

Fl. & Fr.: January-March

Distribution: Fairly common in Plantations of Kariyenkappu and Semi-evergreen forests of Kurukathode. Endemic to Western Ghats.

TEPHROSIA Persoon, Syn. Pl. 2: 328. 1807, *nom. cons.*

1a. Flowers orange-red; pod 6-7 cm long, shortly hirsute *T. tinctoria*

1b. Flowers pink-purple; pod 2.5-4 cm long, glabrous.....*T. purpurea*

Tephrosia purpurea (L.) Pers., Syn. 2: 329. 1807; Hook. f., Fl. Brit. India 2: 112. 1876,p.p.; Gamble, Fl. Pres. Madras 320(226). 1918; Manilal & Sivar., Fl. Calicut 87. 1982; Ansari, Fl. Kasaragod Div. 135. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 156. 1988; Sanjappa, Legumes Ind. 258. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 310. 2009. *Cracca purpurea* L., Sp. Pl. 752. 1753. *Tephrosia hamiltonii* Drumm. ex Dunn in Gamble, Fl. Pres. Madras 320(226). 1918.

Perennial erect or decumbent herbs or subshrubs, up to 50 cm tall. Leaves imparipinnate; leaflets 7-15, 1-2.8 x 0.3-1 cm, oblanceolate or obovate, apex obtuse to emarginate or truncate, base cuneate, mucronate; stipules 3-6 mm long, lanceolate. Flowers ca. 7 mm long, in few-flowered, leaf-opposed, pseudoracemes; pedicels 3-4 mm long; bracts c. 2 mm long. Calyx 3-4 mm long., pubescent; lobes subulate. Petals pink to purplish; standard c. 4 mm broad, orbicular. Staminal tube to 4 mm long. Pods 2.5-4 x 0.3-0.4 cm, linear-oblong; seeds 5-7, ellipsoid, dark brown.

Paripode, KJD 22531

Fl. & Fr.: October-December

Distribution: Rare along the boundaries near Farm.

Tephrosia tinctoria Pers., Syn. 2: 329. 1807; Hook. f., Fl. Brit. India 2: 111. 1876; Gamble, Fl. Pres. Madras 319(225). 1918; Manilal & Sivar., Fl. Calicut 86. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 156. 1988; Sanjappa, Legumes Ind. 259. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 311. 2009.

Erect shrubs; stems densely retrorse-hairy. Leaflets to 4.5 x 1.3 cm, oblong, obtuse, mucronate, acute at base, glabrous above; densely white-tomentose below. Racemes axillary; peduncle 10 cm long; bracts 6 mm long, lanceolate. Flowers red. Calyx 6 mm long, lobes lanceolate. Standard petal glabrous, narrowed to the base; wings to 17 x 5 mm; keel 14 x 6 mm, obovate, glabrous; Pods 7 x 0.5 cm, oblong, slightly curved, minutely hirsute; seeds many.

Ambalappara, KVB 31778

Fl. & Fr.: September-December

Distribution: Fairly common in Grasslands of Ambalappara.

TERAMNUS P. Browne, Civ. Nat. Hist. Jamaica 290. 1756.

1a. Leaflets glabrous; pod glabrous*T. labialis*

1b. Leaflets hairy; pod villous.....*T. mollis*

Teramnus labialis (L.f.) Spreng., Syst. Veg. 3: 235.1826; Hook. f., Fl. Brit. India 2:184.1876; Gamble, Fl. Pres. Madras 352(249). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 157. 1988; Sanjappa, Legumes Ind. 261. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 312. 2009. *Glycine labialis* L.f., Suppl. Pl. 325. 1782.

Slender climbers; branches appressed pubescent. Leaves 3-foliolate; leaflets 1.5-3.5 x 1.5-2.2 cm, ovate or elliptic, base rounded, apex acute, membranous, puberulent below; petiole to 4 cm long. Racemes axillary, up to 6 cm long, with distant clusters or solitary flowers in the axils of 2-3 mm long subulate bracts. Flowers 4 mm long; pedicels c. 2 mm long; bracts 2-3 mm long. Calyx-tube 2-3 mm long, campanulate; lobes acuminate, about equalling the tube, villous. Petals pink, clawed; standard c. 4 mm long, obovate; wings c.3 mm long, narrow-oblong; keels oblanceolate. Stamens monadelphous; anthers alternately fertile and sterile. Ovary tomentose; stigma capitate. Pods 3-4.2 x 0.25-0.3 cm, linear, compressed, thinly addressed pubescent, ending in a hook formed by the persistent style; seeds dark brown.

Kariyenkappu, *KJD 22533*

Fl. & Fr.: October-December

Distribution: Rare in Plantations of Kariyenkappu.

Teramnus mollis Benth., J. Linn. Soc. Bot. 8: 265. 1865; Gamble, Fl. Pres. Madras 352(249). 1918; Ansari, Fl. Kasaragod Div. 136. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 157. 1988; Sanjappa, Legumes Ind. 261. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 312. 2009. *Teramnus labialis* (L. f.) Spreng. var. *mollis* (Benth.) Baker in Hook.f., Fl. Brit. India 2: 184. 1876.

Slender twiners. Leaves 3-foliolate; leaflets unequal, terminal one rhombilanceate, c.9 by 4.5 cm, laterals oblong-lanceate, 7 by 3.5 cm, apex acute, base rounded to subcordate, lower surface densely greyish-tomentose, thin-coriaceous. Racemes axillary, c. 6 cm long, solitary or 2-3, in clusters. Flowers lax. about 2 mm long, pink. Calyx campanulate, lobes more or less 4, upper 2 connate. Petals little exerted, clawed. Stamens 10; monadelphous, anthers alternatively fertile and sterile. Ovary stipitate; style curved. Pods compressed, pubescent, apex hooked; seeds oblong.

Chavachi, *NS & KVB 31303*

Fl. & Fr.: October-March

Distribution: Fairly common in Evergreen forests of Chavachi and Moonamthode.

URARIA Desvaux, J. Bot. Agric. 1: 122. 1813.

Uria rufescens (DC.) Schind., Feddes Repert. 21: 14. 1925 Ansari, Fl. Kasaragod Div. 136. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 158. 1988; Sanjappa, Legumes Ind. 268. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 313. 2009. *Desmodium rufescens* DC., Ann. Sci. Nat. (Paris) 4: 101. 1825; Sasidh., Fl. Chinnar WLS 95. 1999. *Doodia hamosa* Roxb., Fl. India 3: 367. 1832. *Uria hamosa* (Roxb.) Wall. ex Wight & Arn., Prodr. 222.1834; Hook. f., Fl. Brit. India 2: 150. 1876; Gamble, Fl. Pres. Madras 336(237). 1918.

Erect subshrubs; stems triquetrous, hispid. Leaflets to 8.5 x 4.5 cm, elliptic, acute or obtuse at apex and base, hispid below; petiole 1-2.5 cm long; stipules 12 mm long, acuminate; stipel subulate. Flowers distant; bracts 7 mm

long, hispid. Calyx 3 mm long, glabrous. Standard petal 6 x 8 mm, orbicular, cuneate at base, pinkish; wings 5 x 3 mm, oblique, auricled at base; keel 6 x 3 mm, shortly spurred near the base. Joints of pods 6-8, each 2 x 2 mm, hispid, black.

Paripode, *KJD 22543*

Fl. & Fr.: November-January

Distribution: Rare in Semi-Evergreen forests of Paripode.

VIGNA Savi, Pisa Nuov. Giorn. Lett. 8: 113. 1824, *nom. cons.*

1a. Flowers reddish-purple; pods 5-7 cm long..... *V. vexillata* var. *wightii*

1b. Flowers yellow..... 2

2a. Bracteoles broad; pods hirsute *V. radiata* var. *sublobata*

2b. Bracteoles linear; pods glabrous *V. umbellata*

Vigna radiata (L.) Wilczek var. **sublobata** (Roxb.) Verdc., Kew Bull. 24: 559. 1970; Manilal & Sivar., Fl. Calicut 92. 1982; Ansari, Fl. Kasaragod Div. 137. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 159. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 314. 2009. *Phaseolus sublobatus* Roxb., Fl. Ind. 3: 288. 1832; Gamble, Fl. Pres. Madras 363(256). 1918. *Phaseolus trinervius* Heyne ex Wight & Arn., Prodr. 245. 1834; Hook. f., Fl. Brit. India 2: 203. 1876. *Vigna sublobata* (Roxb.) Bairiganjan, Panda, Choudhury & Patnaik, Journ. Econ. Tax. Bot. 7: 274. 1985; Babu & Sharma, Bull. Bot. Surv. India 27: 21. 1987; Sanjappa, Legumes Ind. 276. 1992.

Annual twining herbs; stems, petioles and peduncles clothed with ferruginous, deflexed hairs. Leaflets 3.5-7.5 x 2.8-5 cm, ovate-deltoid, apex obtuse, acute or acuminate, base cuneate to subtruncate, hirsute, the terminal leaflets sometimes lobed; stipules 5-8 x 3-4 mm, falcate-lanceolate or ovate-oblong, peltately fixed; stipels linear. Racemes axillary, capitate, long peduncled, 2-6-flowered. Calyx-lobes c. 2 mm long, ovate-triangular, hairy. Petals yellow. Pods 2.5-5 cm long, linear-oblong, terete, clothed with ferruginous hairs; seeds 4-10, greyish brown, 2.5-3 mm long,.

Kariyenkappu, *KJD 22548*

Fl. & Fr.: November-December

Distribution: Earlier settlements.

Vigna umbellata (Thunb.) Ohwi & Ohashi, Jap. J. Bot. 44: 31. 1969; Ramach. & V.J. Nair, Fl. Cannanore Dist. 159. 1988; Sanjappa, Legumes Ind. 276. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 315. 2009. *Dolichos umbellatus* Thunb., Trans. Linn. Soc. London 2: 339. 1794. *Phaseolus calcaratus* Roxb., Fl. Ind. 3: 289. 1832; Hook. f., Fl. Brit. India 2: 203. 1876; Gamble, Fl. Pres. Madras 363(256). 1918.

Slender twiners; stems reflexed hairy. Leaflets 10 x 5 cm, ovate, acuminate, hispid; petiole 10 cm long, slender, stipule 8 mm long, ovate, decurrent at base. Flowers 2-3-together, in short axillary racemes. Calyx 3 mm long, lobes ovate; petals yellow; standard 10 x 15 mm, strongly auricled at base; wings 8 x 6 mm, orbicular; keel 7 x 6 mm, incurved to one turn, spurred to one side. Pods 7 x 0.5 cm, compressed; seeds many.

Narikkadavu, *KJD 25586*

Fl. & Fr.: October-December

Distribution: Rare in Semi-Evergreen forests of Narikkadavu.

Vigna vexillata (L.) A. Rich. in Sagra, Hist. Fis. Polit. Nat. Cuba 11: 191. 1845, var. **vexillata**; Hook. f., Fl. Brit. India 2:206. 1876; Gamble, Fl. Pres. Madras 364(257). 1918; Ramach. & V.J. Nair, Fl. Cannanore Dist. 160. 1988; Sanjappa, Legumes Ind. 277. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 316. 2009. *Phaseolus vexillatus* L., Sp. Pl. 724. 1753.

Slender climbers. Leaflets to 4.5 x 2 cm, ovate, acute at apex, rounded at base, strigose hairy; petiole 4 cm long; stipule cordate at base. Flowers solitary or 2-3 together. Calyx 9 mm long, strigose hairy; lobes lanceolate. Petals yellow; standard 3 x 3 cm, orbicular, wings 25 x 12 mm, auricled at base; keel 25-30 mm long, strongly spurred on lateral side. Pods 5.5 x 0.5 cm, densely brown-hispid.

Bhoothamkallu, *KJD* 26355

Fl. & Fr.: March-April

Distribution: Rare in Semi-evergreen forests of Bhoothamkallu.

ZORNIA J. F. Gmelin, Syst. Nat. 2: 1076, 1096. 1792.

Zornia gibbosa Span., Linnaea 15:192. 1841; Manilal & Sivar., Fl. Calicut 76. 1982; Ansari, Fl. Kasaragod Div. 138. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 160. 1988; Sanjappa, Legumes Ind. 280. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 316. 2009.

Diffuse or prostrate annual herbs. Leaves 2-foliolate; leaflets 8-25 x 2-8 mm, ovate or lanceolate, apex acute, apiculate, base rounded, punctate; petiole to 1.5 cm long; stipules 5-8 mm long, lanceolate, peltate, acuminate at both ends, punctate. Inflorescence terminal or axillary, bracteate racemes, 4-8 cm long; bracts peltate, 5-11 x 3-4 mm, ovate-lanceolate, acute, ciliated along margin, gland-dotted. Calyx c. 3 mm long; lobes subequal, membranous. Petals yellow, sometimes with red stripes; standard orbicular-cordate; wings obovate-obtuse; keels curved, oblong-obtuse, connate at base. Stamens monadelphous; anthers dimorphic. Ovary pubescent. Pods with 4-6-articulate, c.1.3 cm long, strongly reticulate with retrorsely barbed bristles.

Valayamchal, *KJD* 22582

Fl. & Fr.: September-January

Distribution: Along the boundaries of Farm.

Gliricidia sepium (Jacq.) Kunth ex Walp., Rep. 1: 679. 1842. Planted by previous settlers.

Subfamily CAESALPINIOIDEAE

- 1a. Leaves bipinnate, rachis armed 2
- 1b. Leaves one-pinnate or simple, rachis unarmed 4
- 2a. Fruit winged; leaflets 3-5 pairs *Mezoneurum*
- 2b. Fruit not winged; leaflets 7 or more pairs..... 3
- 3a. Flowers sessile, orange red..... *Moullava*
- 3b. Flowers pedicelled, yellow..... *Caesalpinia*
- 4a. Leaves simple, 2-lobed... .. *Bauhinia*
- 4b. Leaves simple pinnate 3
- 5a. Stipule large foliaceous with basal appendages *Humboldtia*
- 5b. Stipules otherwise..... 4

- 6a. Petals absent 5
- 6b. Petals present 6
- 7a. Leaflets alternate; flowers small, greenish-white Kingiodendron
- 7b. Leaflets opposite; flowers orange-yellow to red Saraca
- 8a. Stamens 3, monodelphous Tamarindus
- 8b. Stamens 5 or more, free 7
- 9a. Fruit woody, terete, 30-40 cm long; flowers several in long drooping racemes. Cassia
- 9b. Fruit flat or four angled or winged, inflorescence otherwise 8
- 10a. Leaflets 15 or more pairs, less than 2 mm wide Chamaecrista
- 10b. Leaflets less than 7 pairs, more than 15mm wide Senna

BAUHINIA L., Sp. Pl. 374. 1753.

- 1a. Flowers red, scandent shrubs *B. phoenicea*
- 1b. Flowers creamy white, trees *B. malabarica*

Bauhinia malabarica Roxb., Fl. Ind. 2: 321. 1832; Hook. f., Fl. Brit. India 2: 227. 1878; Gamble, Fl. Pres. Madras 407(288). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 162. 1988; Sanjappa, Legumes Ind. 3. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 318. 2009. *Piliostigma malabaricum* (Roxb.) Benth. in Miq., Pl. Jungh. 261. 1852; Ansari, Fl. Kasaragod Div. 146. 1985.

Deciduous trees, to 15 m high, bark 10-15 mm thick, brown, rough, shallow with vertical and horizontal furrows, fibrous, exfoliating in long strips. Leaves simple, bilobed, alternate, 5-10 x 7-12.5 cm, broader than long, suborbicular, apex obtuse, base cordate, margin entire, glabrous above, slightly glaucous beneath, coriaceous; stipules small, free, lateral, cauducous; petiole 25-30 mm long, slender, glabrous, swollen at tip and base; 9-11 nerves from the base, palmate, prominent, intercostae reticulate, prominent. Flowers bisexual, 6-8 mm across, cream coloured, in axillary corymbs; pedicels slender, upto 2.5 cm. Calyx tube long, thin, pubescent with 5 short lobes. Petals 5, oblong. Stamens 10, all fertile, alternate ones short; anthers versatile. Ovary half inferior, stipitate; ovules many; style filiform; stigma peltate. Fruit a pod, 25-30 x 1.8-2.5 cm, straight, flattened, beaked, longitudinally striate, glabrous; seeds 20-30, oblong.

Kanadivechakunnu, *KJD 18741*

Fl. & Fr.: September-March

Distribution: Rare in Evergreen forests of Kannadivechakunnu.

Bauhinia phoenicea Wight & Arn., Prodr. 296. 1834; Hook. f., Fl. Brit. India 2: 283. 1878; Gamble, Fl. Pres. Madras 408(289). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 162. 1988; Sanjappa, Legumes Ind. 4. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 318. 2009. *Phanera phoenicea* (Wight & Arn.) Benth. in Miq., Pl. Jungh. 262. 1852. *Bauhinia benthamii* Bedd., Ic. t. 107. 1868-1874.

Large climbing shrubs. Leaves to 10 cm across, orbicular, deeply bifid above, lobes acute, cordate at base; 9-ribbed from base, nervules parallel. Flowers in extra-axillary racemes, axis 10-20-flowered; pedicel 3 cm long. Calyx tube short, lobes 2 cm long, oblong, puberulus outside. Petals 5, 4 x 0.8 cm, long-clawed, spreading. Stamens 4 or 5, exserted, anthers linear, 6 mm long; style slender; stigma peltate. Pods to 16 x 2.5 cm, oblong, broaden above, densely rusty, pubescent; seeds many.

Chavachi, *KJD 22583*

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Chavachi and Moonamthode, plantations of Kariyenkappu and Seni-evergreen forests of Narikkadavu, Pookundu, Kurukathode and Paripode. Endemic to Western Ghats.

CAESALPINIA L., Sp. Pl. 380. 1753.

Caesalpinia mimosoides Lam., Encycl. 1: 452.1785; Hook. f., Fl. Brit. India 2:256.1878; Gamble, Fl. Pres. Madras 394(279). 1919; Manilal & Sivar., Fl. Calicut 98. 1982; Ansari, Fl. Kasaragod Div. 141. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 163. 1988; Sanjappa, Legumes Ind. 12. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 321. 2009.

Straggling shrubs with tuberous root stock, prickly all over; twigs glandular hairy. Leaves to 40 cm long; pinnae 12-18 pairs; leaflets 10-15 pairs, c. 6 x 3 mm, oblong or elliptic, apex obtuse, base unequal; rachis prickly and glandular hairy. Flowers ca. 2.5 cm across, bright yellow, in terminal and leaf-opposed racemes up to 40 cm long. Calyx-tube 2 mm long; lobes 5, 0.9-1.2 cm long, oblong or obovate, glandular. Petals 5, yellow, c. 1.2 x 1 cm, orbicular; upper petal c. 1.2 x 0.5 cm, obovate, spathulate, clawed. Stamens 10; filaments subequal, hairy at base. Ovary stipitate, oblong, 2-4-ovuled; stigma entire. Pods c. 4.5 x 2.5 cm, oblong-obvoid, turgid; seeds 2.

Paripode, *KJD 22584*

Fl. & Fr.: February-September

Distribution: Fairly common along the boundaries of the Farm.

CASSIA L., Sp. Pl. 376. 1753.

Cassia fistula L., Sp. Pl. 377. 1753; Hook. f., Fl. Brit. India 2: 201. 1878; Gamble, Fl. Pres. Madras 400(283). 1919; Manilal & Sivar., Fl. Calicut 96. 1982; Ansari, Fl. Kasaragod Div. 143. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 164. 1988; Sanjappa, Legumes Ind. 15. 1992; V. Singh, Monogr. Indian Subtribe Cassiinae 25. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 322. 2009. *Cassia rhombifolia* Roxb., Fl. Ind. 3: 334. 1832.

Deciduous trees, to 18 m high, bark 8-10 mm, thick, surface pale when young, dark grey when old, smooth, exfoliating in hard scales. Leaves paripinnate, alternate, leaflets 6-16, opposite, 5-18.5 x 3-6.5 cm, ovate, ovate-lanceolate or oblong-ovate, apex acuminate, base obtuse, round or acute, margin entire, glabrous above, glaucous and puberulent beneath, coriaceous; stipules small, free, lateral, cauducous; rachis 14.5-36 cm, slender, pulvinate, glabrous; petiolule 4-7 mm long, slender, grooved above; lateral nerves 9-25, pinnate, slender, prominent, secondary laterals prominent; intercostae reticulate, prominent. Flowers bisexual, 3.7-5 cm across, yellow, in axillary drooping racemes; pedicels 3-7 cm. Calyx tube short, lobes 5, 1 x 0.6 cm, ovate, apex obtuse, reflexed. Petals 5, 2.5 x 1.5 cm, obovate, subequal, clawed. Stamens 10, all fertile; upper 3 short with erect filaments to 7.5 mm; anthers 3 mm, basifixed; lower 3 large with curved filaments, to 3 cm; anthers 5 mm, dorsifixed; medium 4 with erect filaments to 1 cm; anthers versatile with curved beak to 6.5 mm; anthers dehiscing by apical pores. Ovary half inferior, appressed-pubescent; ovules many; style to 5 mm; stigma punctiform. Fruit a pod 30-60 x 1.2-1.6 cm, cylindrical, black, shortly stipitate, indehiscent, woody, transversely septate; seeds 25-100, 6-8 mm broad, ovoid, pale brown, immersed in pulp.

Kariyenkappu, *KJD 18793*

Fl. & Fr.: February-September

Distribution: Earlier settlements at Kariyenkappu.

CHAMAECRISTA (Breyne) Moench, Meth. 272. 1794.

Chamaecrista mimosoides (L.) Greene, Pittonia 4:27.1899; V. Singh, Monogr. Indian Subtribe Cassiinae 67. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 323. 2009. *Cassia mimosoides* L., Sp. Pl. 379. 1753; Hook. f., Fl. Brit. India 2: 266. 1878; Gamble, Fl. Pres. Madras 403(285). 1919; Manilal & Sivar., Fl. Calicut 95. 1982; Ansari, Fl. Kasaragod Div. 144. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 165. 1988; Sanjappa, Legumes Ind. 17. 1992; Sunil & Sivadasan, Fl. Alappuzha Dist. 255. 2009.

Shrubs or herbs, young stem, rachis often appressed hairy. Leaves spirally arranged or distichous, paripinnate, 4-8 cm long; leaflets opposite 24-50 pairs, 3-6 x 1-2 mm, linear-oblong, oblique at base, margins ciliate; rachis with a sessile gland near the base; stipules linear 5-8 mm long. Flowers solitary or many-flowered, racemes, axillary or supra axillary; peduncle 1-2 cm long; bracts ovate, 3-6 mm long; bracteoles scarious; pedicels 0.5-1.5 cm long. Sepals 5, lanceolate, 4-5 mm long. Petals 5, yellow, 5-8 mm long, obovate. Stamens 10, alternate short and long. Ovary linear, densely silky hairy, stigma truncate. Pods 3-6 x 0.4-0.5 cm. plano-compressed, thickened along sutures, elastically dehiscent; seeds c. 20, ellipsoid.

Ambalappara, *KJD 26310*; *NS & KJD 25519*

Fl. & Fr.: July-December

Distribution: Fairly common in Grasslands of Ambalappara.

HUMBOLDTIA Vahl, Symb. Bot. 3: 106. 1794, *nom. cons.*

Humboldtia brunonis Wall., Pl. Asiat. Rar. 3: 17. t.233. 1832; Hook. f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Pres. Madras 411(291). 1919; Sanjappa, Blumea 31: 333. 1986 & Legumes Ind. 30. 1992; Ansari, Fl. Kasaragod Div. 145. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 166. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 326. 2009.

Trees, to 10 m high, bark dark brown to black; branchlets solid, sometimes swollen, pubescent when young, glabrous at maturity, lenticellate. Leaves paripinnate, alternate, leaflets (2)-4, opposite, 7-20 x 2.2-8 cm, obovate oblong, oblong or elliptic-oblong, apex obtusely acuminate, base unequal, margin entire, glabrous, sparsely depressed glandular beneath, coriaceous; stipules 1-2 x 0.25-0.5 cm, lateral, linear, prominently parallel veined, glabrous, depressed glandular; appendages broadly reniform, divergently veined, glabrous, glandular, persistent; rachis 20-40 mm long, obscurely winged, shallowly grooved above, tomentose, pulvinate; petiolules 3-5 mm long, stout; lateral nerves 7-13 pairs, pinnate, ascending, prominent, intercostae reticulate, prominent. Flowers bisexual, 2-3 cm long, white, in axillary pendulous, brown pubescent, racemes; pedicels 4-5 mm long, pilose; bracts ovate, acute, pubescent without, fugacious; bracteoles 2, connate below, obovate or obovate-oblong, obtuse at apex, pubescent on both surfaces, shortly ciliate along margin. Calyx tube 8-10 mm long, lined by the disc, pubescent without; lobes 4, concave, imbricate, acute or obtuse at tip, densely pubescent without and thinly within, reddish, fugacious. Petals 3, white, pink or orange, ovate, shortly clawed, veined, glabrous. Stamens 5, perfect, free, alternating with 5 minute staminodes, deep pinkish; filaments 2 cm long, glabrous; anthers 2-3 mm long, versatile. Ovary 5 mm long, half inferior, stipitate, obliquely linear; ovules 3-5, densely pubescent; style filiform, 10 mm

long, pilose at base; stigma capitate. Fruit a pod 5-10 x 2-4 cm, dolabriform, brown pubescent when young; seeds 3-4.

Kattikari, *NS & KJD 31903*; Kariyenkappu *KVB 31213*;
Pothurumi, *KVB 31617*

Fl. & Fr.: July-February

Distribution: Common in the Evergreen forests of Kariyenkappu, Chavachi, Chelachode, Moonamthode, Kattikari, Meenmutty, Kannadivechakunnu and Kurumbankallu. Endemic to southern Western Ghats.

KINGIODENDRON Harms, in Engl. & Prantl, *Pflanzenf. Nachtr.* 1: 194. 1897.

Kingiodendron pinnatum (Roxb. ex DC.) Harms in Engl. & Prantl, *Naturl. Pflanzenfam.* 1(1): 194. 1897; Gamble, *Fl. Pres. Madras* 412(292). 1919; Sanjappa, *Legumes Ind.* 32. 1992; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 326. 2009. *Hardwickia pinnata* Roxb. ex DC., *Prodr.* 2: 487. 1825; Hook. f., *Fl. Brit. India* 2: 270. 1878.

Evergreen trees, to 30 m high, bark 5-8 mm thick, surface greyish-brown with green blotches, rough; exuding a sticky resin. Leaves imparipinnate, alternate; leaflets 5-9, alternate, 4.5-10.5 x 2-4.5 cm, ovate-lanceolate or oblong, apex acuminate, falcate or oblique, margin entire, glabrous, coriaceous; stipules minute, lateral, caudicous; rachis 10-15.2 cm, slender, pulvinate, glabrous; petiolule 5-10 mm, stout, grooved above, glabrous; lateral nerves 8-13, pinnate, slender, prominent, secondary laterals present, intercostae reticulate, prominent. Flowers bisexual, 2-3 mm across, white, in axillary and terminal paniced racemes. Calyx tube almost wanting, lobes 5, broadly ovate, imbricate. Petals 0; disc very small. Stamens 10, equal, filaments filiform, villous at base; anthers versatile. Ovary half inferior, sessile, villous at base; ovules 2; style subulate; stigma minute, oblique. Fruit a pod, 4-5 x 2-2.5 cm, ovate-ellipsoid, turgid, obtusely beaked, prominently veined, dark brown, indehiscent; seed one, pendulous.

Chavachi, *KVB 31533*

Fl. & Fr.: January-December

Distribution: Rare in Evergreen forests of Chavachi and Pothurumi. Endemic to southern Western Ghats; Conservation status: Endangered.

MEZONEURUM (Desf.) Vidal ex Herend. & Zarucchi, *Ann. Missouri Bot. Gard.* 77(4): 854. 1990.

Mezoneurum cucullatum (Roxb.) Wight & Arn., *Prodr.* 283. 1834; Hook. f., *Fl. Brit. India* 2: 258. 1878; Gamble, *Fl. Pres. Madras* 395(279). 1919; Sivar. & Mathew, *Fl. Nilambur* 236. 1997. *Caesalpinia cucullata* Roxb., *Fl. Ind.* 2: 358. 1832; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 163. 1988; Sanjappa, *Legumes Ind.* 10. 1992; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 320. 2009.

Stout climbers; old stem covered with strong thorns with clavate thick base. Leaves paripinnate, 45 cm long; pinnules 5 or 6 pairs; leaflets 3 pairs, 10 x 4 cm, ovate, acuminate, glabrous; rachis with strong curved thorns. Racemes to 25 cm long, clustered. Flowers 2 cm across, irregular, cucullate. Sepals unequal, lobes obtuse, glabrous. Petals unequal, orbicular; filaments glabrate. Pods 10 x 2.5 cm, flattened, oblong, obtuse, glabrous.

Paripode, *KJD 22585*

Fl. & Fr.: December-March

Distribution: Fairly common in Plantations of Kariyenkappu, Semi-evergreen forests of Kurukathode and Paripode.

MOULLAVA Adans., Fam. Pl. 2: 318. 1763.

Moullava spicata (Dalz.) Nicolson in Manilal, Bot. Hist. Hort. Malab. 181. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 167. 1988; Ansari, Fl. Kasaragod Div. 146. 1985; Sanjappa, Legumes Ind. 33. 1992; Sivar. & Mathew, Fl. Nilambur 237. 1997. *Caesalpinia spicata* Dalz., Hook.'s J. Bot. Kew Gard. Misc. 3: 90. 1851; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 321. 2009. *Wagatea spicata* (Dalz.) Wight, Ic. t. 1995. 1853; Hook. f., Fl. Brit. India 2: 261. 1878; Gamble, Fl. Pres. Madras 397(281). 1919; Manilal & Sivar., Fl. Calicut 98. 1982.

Scandent shrubs with sharp scattered prickles. Leaves alternate, 30 cm long, pinnae 4 or 5 pairs; leaflets 5 or 6 pairs, to 4 x 2.5 cm, elliptic-oblong, obtuse or acute, base rounded or cordate, glabrous above, pale beneath. Racemes paniced, to 50 cm long; flowers subsessile. Calyx scarlet, lobes oblong, obtuse, densely puberulous. Petals ovate-spathulate, reticulately veined, orange-yellow, ca. 1 cm long. Alternate stamens long and short, filaments pilose at base. Ovary pubescent; ovules 4-6; stigma shortly 2-lobed. Pods linear-oblong, subtorulose, to 5 x 1.5 cm; seeds 3 or 4.

Meenmutty, KVB 31268

Fl. & Fr.: March-January

Distribution: Common in Evergreen forests of Meenmutty, Kariyenkappu, Chavachi, Moonamthode and Kurukathode. Endemic to Western Ghats.

SARACA L., Syst. Nat. (ed 12) 2: 469. 1767.

Saraca asoca (Roxb.) de Wilde, Blumea 15: 393. 1968; Manilal & Sivar., Fl. Calicut 94. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 167. 1988; Sanjappa, Legumes Ind. 35. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 327. 2009. *Jonesia asoca* Roxb., Asiat. Res. 4: 365. 1799. *Saraca indica* sensu Bedd., Fl. Sylv. t. 57. 1870; Hook. f., Fl. Brit. India 2: 271. 1878, non L. 1769; Gamble, Fl. Pres. Madras 409(289). 1919.

Trees, to 10 m high, bark 2-3 mm thick, surface brown or brownish-black, lenticellate. Leaves paripinnate, alternate; leaflets 6-12, opposite, 7-28.5 x 2-8.5 cm, narrowly oblong, oblong-ovate or ovate-lanceolate, round, cuneate or acute, apex acute or acuminate, base obtuse, margin entire, glabrous, coriaceous; stipules 7-20 mm long, intra petiolar, scarious, ovate, connate; rachis 4-25 cm long, slender, pulvinate, glabrous; petiolule 2-10 mm long, stout, glabrous; lateral nerves 10-15 pairs, pinnate, arched towards the margin, slender, faint, intercostae reticulate, faint. Flowers bisexual, yellow-orange or red, in dense sessile paniculate corymbs, axillary to leaves or leaf scars; bracts ovate, small deciduous; bracteoles 4 mm long oblong-spathulate, ciliolate, coloured, subpersistent. Calyx 4 cm long, petaloid, cylindric, enclosing a lobed disc; lobes 4, ovate-oblong, unequal, spreading, imbricate. Petals 0. Stamens 7 or 8, much exerted, free; filaments long, filiform, coloured, glabrous; anthers versatile. Ovary half inferior, stipitate, the stipe adnate below to one side of the disc, pubescent; style incurved, glabrous, filiform; stigma small, capitate; ovules many. Fruit a pod 10-5 x 2-5 cm, flat, oblong, coriaceous or almost woody, tapering at both ends; continuous within; seeds 2-8, 3.8 cm long, ovoid, slightly compressed.

Chavachi, NS & KVB 31308

Fl. & Fr.: January-August

Distribution: Rare in Evergreen forests of Meenmutty, Chavachi and Pottichapara. Conservation status: Vulnerable.

SENNA P. Miller, Gard. Dict. Abr. Ed. 4. 1754.

- 1a. Fruit winged*S. alata*
- 1b. Fruit not winged 2
- 2a. Leaves not glandular at base or inbetween leaflets on rachis *S. montana*
- 2b. Leaves glandular at base or inbetween leaflets on rachis 3
- 3a. Branchlets and fruits hirsute*S. hirsuta*
- 3b. Branchlets and fruits glabrous 4
- 4a. Leaflets 4 or 5 paired, ovate-lanceolate; seeds ovoid or ovoid-oblong. *S. occidentalis*
- 4b. Leaflets 2-4 pairs, oblong, obtuse at apex; seeds oblong *S. tora*

Senna alata (L.) Roxb., Fl. Ind. 2: 349. 1832; V. Singh, Monogr. Indian Subtribe Cassiinae 99. 2001.

Cassia alata L., Sp. Pl. 378. 1753; Hook. f., Fl. Brit. India 2: 264. 1878; Gamble, Fl. Pres. Madras 404(286). 1919; Manilal & Sivar., Fl. Calicut 96. 1982; Ansari, Fl. Kasaragod Div. 143. 1985; Sanjappa, Legumes Ind. 14. 1992.

Erect shrubs to 4 m tall. Leaves 28-60 cm long; leaflets 6-12 pairs, 4-13 x 2-6 cm, oblong to obovate-oblong, apex rounded, base rounded to subcordate; stipules 1-2 cm long, deltoid, base auriculate, apex acute to acuminate. Inflorescence terminal or axillary, many-flowered spicate raceme, 40-60 cm long. Flowers yellow; pedicels 4-8 mm long; bracts petaloid, yellow, 1-2 cm long, ovate-elliptic, subacute. Sepals 1-1.5 cm long, yellow. Petals yellow, 1.5-2 cm long, obovate. Stamens 10, anthers 2 large, 5 medium-sized, and 3 small. Pods 9-14 x 1.5-2 cm, linear, 4-winged, septate, dehiscent; seeds many, 5-7 x 4-5 mm, rhomboid, compressed, dark brown.

Narikkadavu, *KJD 22507*

Fl. & Fr.: September-January

Distribution: Rare at riverbanks of Narikkadavu along boundaries.

Senna hirsuta (L.) Irwin & Barneby, Phytologia 44: 499. 1979; V. Singh, Monogr. Indian Subtribe Cassiinae 137. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 328. 2009. *Cassia hirsuta* L., Sp. Pl. 378. 1753; Hook. f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; Manilal & Sivar., Fl. Calicut 97. 1982; Ansari, Fl. Kasaragod Div. 143. 1985; Sanjappa, Legumes Ind. 15. 1992.

Erect undershrubs, densely hirsute all over. Leaves to 18 cm long, usually with 3-5 pairs of leaflets; leaflets 3.5-6 x 2-3.5 cm, ovate or elliptic, apex acuminate, base rounded, silky hairy on both sides; rachis 8-12 cm long, a large black gland on the rachis just below the lowest leaflets; stipules 5-8 mm long, linear-lanceolate. Flowers yellow, c.1.5 cm across, in axillary and terminal few-flowered racemes; pedicels 1-1.4 cm long; bracts linear. Sepals 5, 5-8 mm long, oblong, densely hairy without. Petals 5, 0.8-1 cm long, obovate, obtuse. Stamens 10, unequal, 6 or 7 fertile. Ovary 2-2.5 mm long, tomentose; ovules many; style glabrous. Pods 10-15 x 0.6-0.8 cm, linear, subterete, curved, densely hirsute; seeds many, c. 3 x 2.5 mm, orbicular, compressed, light brown.

Paripode, *KJD 26361*

Fl. & Fr.: September-December

Distribution: Rare along the boundaries near Farm.

Senna occidentalis (L.) Link, Handb. 2: 140. 1831; V. Singh, Monogr. Indian Subtribe Cassiinae 170. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 329. 2009. *Cassia occidentalis* L., Sp. Pl. 377. 1753; Hook. f., Fl. Brit. India 2: 262. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; Manilal & Sivar., Fl. Calicut 97. 1982; Ansari, Fl. Kasaragod Div. 144. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 165. 1988; Sanjappa, Legumes Ind. 19. 1992.

Erect subshrubs up to 2 m tall. Leaves up to 22 cm long; leaflets 4-5 pairs, 2.5-7 x 1.5-3.5 cm, ovate-lanceolate, apex acute or acuminate, base rounded, glabrous or pubescent; rachis to 18 cm long with a sessile, hemispherical gland at base; stipules 4-7 mm long, linear-lanceolate, acuminate, caducous. Flowers c. 2 cm across, in terminal and axillary racemes, to 3 cm long; pedicels 0.8-1.2 cm long; bracts linear-lanceolate. Sepals 6-10 mm long, ovate, obtuse, mucronate. Petals 5, yellow, 1-1.5 cm long, obovate. Stamens 10, unequal, only 7 fertile. Pods 5-9 x 0.6-0.8 cm, linear, compressed; seeds 20-25, 4-5 x 3-4 mm, ovate or suborbicular, compressed, brown.

Valayamchal Near Farm, KJD 26376

Fl. & Fr.: July-December

Distribution: Seen along the boundaries of Farm.

Senna tora (L.) Roxb., Fl. Ind. 2:340.1832; V. Singh, Monogr. Indian Subtribe Cassiinae 222. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 330. 2009. *Cassia tora* L., Sp. Pl. 376. 1753; Hook. f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Pres. Madras 401(284). 1919; Manilal & Sivar., Fl. Calicut 96. 1982; Ansari, Fl. Kasaragod Div. 145. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 166. 1988; Sanjappa, Legumes Ind. 22. 1992.

Annual, glabrous subshrubs up to 1 m tall. Leaves to 15 cm long, bearing a slender cylindrical gland on the rachis between the leaflets of the lower 2 pairs; leaflets 2-4 pairs, 1.5-4.5 x 1.5-2.5 cm, obovate-oblong, apex obtuse, base somewhat oblique, pubescent below; stipules 1-1.5 x 0.1-0.2 cm, linear. Flowers c. 1.5 cm across, in few-flowered axillary racemes; pedicels 4-6 mm long; bracteoles 2, 2-3 mm long. Sepals 5, 5-6 mm long, obovate-obtuse. Petals 5, yellow, 8-12 mm long, obovate-obtuse. Stamens 10, unequal, only 7 fertile, 3 large, 4 medium, 3 staminodal. Ovary subsessile, pubescent; ovules numerous. Pods 8-14 x 0.3-0.6 cm, linear, subtetragonous, septate between seeds, indehiscent; seeds 20-30, 4-5 mm long, oblong, compressed, chestnut-brown.

Narikkadavu, KJD 22554

Fl. & Fr.: August-December

Distribution: Near stream sides of boundaries.

Senna montana (Heyne ex Roth) V. Singh, J. Econ. Taxon. Bot. 16: 600. 1992 & Monogr. Indian Subtribe Cassiinae 154. 2001. *Cassia montana* Heyne ex Roth, Nov. Pl. Sp. 214. 1821; Hook. f., Fl. Brit. India 2: 264. 1878; Gamble, Fl. Pres. Madras 402(284). 1919; Sanjappa, Legumes Ind. 18. 1992.

Large shrubs to small trees, young shoots yellow tomentose. Leaves to 18 cm long; leaflets oblong, obtuse mucronate, base rounded, to 3 x 1.2 cm. Flowers 2.5 cm across, yellow, in axillary and terminal short corymbose

panicles. Petals obovate. Stamens 10, upper 3 staminodes. Fruit compressed, beaked; seeds ca. 20, ovoid, longitudinal.

Chullikandam, *KJD 31494*

Fl. & Fr.: November-January

Distribution: Rare in Evergreen forests of Chullikandam. Endemic to Peninsular India.

TAMARINDUS L., Sp. Pl. 34. 1753.

Tamarindus indica L., Sp. Pl. 34. 1753; Hook. f., Fl. Brit. India 2: 273. 1878; Gamble, Fl. Pres. Madras 409(290). 1919; Manilal & Sivar., Fl. Calicut 94. 1982; Ansari, Fl. Kasaragod Div. 147. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 168. 1988; Sanjappa, Legumes Ind. 36. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 330. 2009.

Trees, to 20 m high, bark brown to brownish-black, rough with vertical fissures; branchlets warty, tomentose. Leaves paripinnate, alternate, leaflets 20-34, opposite, sessile, 1.5-4 x 0.4-1.3 cm, oblong, apex obtuse, base unequal, margin entire, glabrous, chartaceous; stipules lateral, minute, cauducous; rachis 8-13 cm long, slender, glabrous, pulvinate; lateral nerves 10-15 pairs, pinnate, slender, obscure, looped at the margin forming intramarginal nerve; intercostae reticulate, obscure. Flowers bisexual, 1 cm across, yellow with reddish-pink dots, in lax terminal racemes; bracts and bracteoles ovate-oblong, coloured, cauducous; pedicels upto 5 mm. Calyx tube narrowly turbinate, lined by disc; lobes 4, subequal, oblong, imbricate. Petals 3, outer one, 1 x 0.3 cm, rolled up, pink dotted, lateral 2, 1-1.5 x 0.7-1 cm, clawed, subequal, oblong-lanceolate, lower pair scaly. Stamens 9 monadelphous, only 3 fertile, others reduced to bristle, base pubescent; anthers versatile; ovary half inferior, stipitate, adnate to the disc, ovules many; style attenuate, tomentose; stigma globose. Fruit a pod 10-15 x 1-2 cm, oblong, fruit wall crustaceous, mesocarp pulpy, endocarp septate, leathery, indehiscent; seeds 3-8 or more, obovoid-orbicular, compressed, brown.

Chavachi, *KJD 22529*

Fl. & Fr.: September-April

Distribution: Cultivated at earlier settlements.

Subfamily MIMOSOIDEAE

- 1a. Plants armed with prickles Acacia
- 1b. Plants unarmed 2
- 2a. Pods bristly, to 3 x 0.5 cm or less Mimosa
- 2b. Pods not bristly, over 5 cm long 3
- 3a. Leaves with 1 pair of pinnae 4
- 3b. Leaves with 2 or more pairs of pinnae 5
- 4a. Fruit obliquely oblong, seed without a funicle Xylia
- 4b. Fruit circinate, seed attached by a funicle Archidendron
- 5a. Climber, leaf rachis ending in tendril Entada
- 5b. Trees, leaves without tendril Albizia

ACACIA P. Miller, Gard. Dict. ed. 4. 28. 1754.

- 1a. Fruit rugose, wrinkled *A. sinuata*
- 1b. Fruit neither rugose nor wrinkled 3
- 2a. Leaflets 1 mm wide, 40-60 pairs per pinna *A. pennata*
- 2b. Leaflets 2 mm or more wide, leaflets 12-30 pairs per pinna 4
- 3a. Leaflets 3-4 mm wide; pods reddish brown *A. torta*
- 3b. Leaflets 2 mm wide; pods yellowish *A. caesia*

Acacia caesia (L.) Willd., Sp. Pl. 4: 1090. 1806; Gamble, Fl. Pres. Madras 428(304). 1919; Ansari, Fl. Kasaragod Div. 148. 1985; Sanjappa, Legumes Ind. 37. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 604. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 332. 2009. *Mimosa caesia* L., Sp. Pl. 522. 1753p.p. *Acacia intsia* Willd. var. *caesia* (L.) Baker in Hook. f., Fl. Brit. India 2: 297. 1878. *Acacia columnaris* Craib., Bull. Misc. Inf. Kew 1915: 410. 1915; Gamble, Fl. Pres. Madras 429(304). 1919.

Stout ramblers; old stem 4-6-angled; prickles strong, recurved, bark fibrous. Leaves 20-25 cm long, pinnae 5-8 pairs, to 7 cm long; leaflets 18-22 pairs, to 11 x 3.5 mm, oblong, apiculate at apex, truncate at base; thinly pubescent below, 3-nerved from base. Heads terminal, paniced. Pods to 13 x 2.2 cm, oblong, flat, acuminate at both ends, marginate.

Narikkadavu, NS & KVB 31456

Fl. & Fr.: October-May

Distribution: Common in Plantations of Kariyenkappu, Semi-evergreen forest of Paripode and Narikkadavu.

Acacia pennata (L.) Willd., Sp. Pl. 4: 1090. 1806; Hook. f., Fl. Brit. India 2: 297. 1878p.p.; Gamble, Fl. Pres. Madras 429(304). 1919; Manilal & Sivar., Fl. Calicut 100. 1982; Ansari, Fl. Kasaragod Div. 148. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 168. 1988; Sanjappa, Legumes Ind. 42. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 620. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 333. 2009. *Mimosa pennata* L., Sp. Pl. 522. 1753.

Woody climbers, stem to 4 cm diameter, smooth; branchlets, rachises and inflorescence densely, minutely, light brown tomentellous; the branches and the underside of the rachises with recurved, hooked, smooth prickles, those on the branchlets 2-4 mm long, their base broad. Leaves bipinnate, alternate, pinnae 7-18 pairs, up to 4 cm long with slender, sparsely tomentellous rachillae without thorns; leaflets sessile, chartaceous, overlapping, usually glabrous with fimbriate margins, very small, 30-50 pairs, very narrow, linear, base oblique, midrib diagonal, running along and very near the margins, 2-3 x 0.5-1 mm, mucronate; rachis up to 15 cm long with 4 cm petiolar part which has scattered c. 1 mm long prickles and a large, flattish, oval gland near its base; smaller, more rounded flattened glands are found between the bases of the upper 1-3 pairs of pinnae. Flower heads globose, 1-3 together in leaf axils and these combined into a terminal, many-umbelled panicles, up to 20 cm long, densely pale brown tomentellous. Heads 1-2 cm diameter. Flowers subsessile; bracts spatulate, apical part fimbriate. Calyx thin, campanulate, 1.5-2 mm long, glabrous or very minutely and shortly pilose, the teeth distinct, 1 mm long, brown red. Corolla hardly 1 mm longer than the calyx, light green, the tips of the lobes green or red brown. Pod 15-20 x 2-3 cm, strap-shaped, flat with slightly raised sutures, smooth, reddish brown, thin, the suture straight with few or no indents, dehiscent, along both sutures, distinctly stalked, apex acute; seeds 6-12, flat, round; the pod slightly bullate over the seeds.

Paripode, KJD 18717

Fl. & Fr.: October-January

Distribution: Rare in Deciduous forests of Paripode.

Acacia sinuata (Lour.) Merr., Trans. Amer. Philos. Soc. n.s.24: 186. 1935; Ramach. & V.J. Nair, Fl. Cannanore Dist. 168. 1988; Chakrab. & Gangop., Journ.

Econ. Tax. Bot. 20: 625. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 333. 2009. *Mimosa sinuata* Lour., Fl. Cochinch. 653. 1790. *Mimosa concinna* Willd., Sp. Pl. 4: 1039. 1806. *Acacia concinna* (Willd.) DC., Prodr. 2: 464. 1825; Hook. f., Fl. Brit. India 2: 296. 1878; Gamble, Fl. Pres. Madras 429(304). 1919; Sanjappa, Legumes Ind. 38. 1992. *Acacia concinna* (Willd.) DC. var. *rugata* (Benth.) Baker in Hook. f., Fl. Brit. India 2: 297. 1878. *Acacia rugata* (Lam.) J. Voigt, Hort. Suburb. Calcutt. 263. 1845, non Benth. 1842; Gamble, Fl. Pres. Madras 429(304). 1919.

Scandent shrubs with stout recurved prickles, stem with warty tubercles; branchlets pubescent, black. Leaves alternate, bipinnate, pinnae 8-10 pairs, to 5 cm long; leaflets sessile, 25-30 pairs, to 6 x 1 mm, oblong, truncate at base, pubescent; rachis to 4 cm long, prickled, gland near the base spherical, sessile. Heads axillary, solitary or paired, 1 cm across, in axillary and terminal racemes; peduncle 3 cm long. Calyx 3 mm long, dull red, 5-lobed. Petals white longer than the calyx. Stamens numerous; filaments 5 mm long, basally connate. Pods rugose and wrinkled, reddish-brown, 12 x 2 cm; seeds 7-12, transverse.

Kariyenkappu, *KJD 22515*

Fl. & Fr.: February-March

Distribution: Rare in Plantations of Kariyenkappu.

Acacia torta (Roxb.) Craib, Bull. Misc. Inform. Kew 1915: 410. 1915; Gamble, Fl. Pres. Madras 428(304). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 169. 1988; Sanjappa, Legumes Ind. 44. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 334. 2009. *Mimosa torta* Roxb., Fl. Ind. 2: 566. 1832. *Acacia caesia* Wight & Arn., Prodr. 278. 1834, non Willd. 1806.

Rambling shrubs with recurved prickles; branchlets puberulus. Leaves alternate, to 24 cm long; bipinnate, pinnae 6-10 pairs; leaflets 25-30 pairs, 8 x 3 mm, oblong, obtuse at apex, subcordate at base, slightly pubescent, 1-nerved from base; petiole to 5 cm long with a basal globose gland. Heads 1.5 cm across, solitary or in groups of 2 or 3 in terminal panicles. Calyx 1 mm long, 5-lobed. Petals oblong 2 mm long. Staminal filaments 5.5 mm long, yellow. Pods 16 x 2.5 cm, flat, papery, yellowish-brown, densely glandular; seeds 6-8.

Kariyenkappu, *KJD 18719*

Fl. & Fr.: April-December

Distribution: Fairly common in Plantations of Kariyenkappu.

ALBIZIA Durazz., Mag. Tosc. 3(4): 13. 1772.

- 1a. Leaflets under 5 mm broad..... 2
- 1b. Leaflets over 1.5 cm broad..... 3
- 2a. Stipules large, foliaceous, pinnae 12-18 pairs, leaflets 5-7 mm long *A. chinensis*
- 2b. Stipules small, deciduous, pinnae 4-6 pairs, leaflets 1.5-2 cm long *A. odoratissima*
- 3a. Flower heads in axillary fascicles, flowers pedicelled *A. lebbeck*
- 3b. Flower heads in terminal panicles, flowers sessile *A. procera*

Albizia chinensis (Osbeck) Merr., Amer. J. Bot. 3: 575. 1916; Manilal & Sivar., Fl. Calicut 100. 1982; Sanjappa, Legumes Ind. 54. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 584. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 336. 2009. *Mimosa chinensis* Osbeck, Dagbok. Ostind. Resa 233. 1757. *Acacia stipulata* DC., Prodr. 2: 469. 1825. *Albizia stipulata* (Roxb.) Boivin, Encycl. 19:33. 1838; Hook. f., Fl. Brit. India 2: 300. 1878. *Mimosa stipulata* Roxb., Fl. Ind. 2: 549. 1832. *Albizia marginata* (Lam.) Merr., Philipp. J. Sci. 5: 23. 1910; Gamble, Fl. Pres. Madras 433(307). 1919. *Mimosa marginata* Lam., Encycl. 1:12.1783.

Deciduous trees; to 25 m high; bark 5-6 mm thick, surface brownish-grey, smooth, horizontally furrowed; branchlets minutely golden tomentellous. Leaves bipinnate, alternate, pinnae 4-20 pairs, opposite, even pinnate, 8-12.5 cm long, slender, sparsely tomentellous; with a gland in between each pairs or on distal 2-3 pairs; leaflets 50-90, opposite, even pinnate, sessile, 3-6 x 15-18 mm, falcate-lanceolate or falcate, apex acute, base oblique, subtruncate or obtuse, margin entire, ciliate, glabrous above, sparsely tomentellous and glaucous beneath, chartaceous; stipules 2.5-4 x 1 cm, free, lateral, obliquely cordate, crisped, orange-pink, pubescent, with filiform tail, base much dilated at one side, caducous; rachis 18-35 cm, slender, grooved above, pulvinate, sparsely minutely tomentellous, with a gland near its base on upper side; midrib starting and ascending along the distal margin, lateral nerves obscure. Flowers bisexual, white, in globose heads, 2-6 in axillary fascicles or arranged in terminal and axillary panicles; peduncle slender, pubescent; pedicel 0.5-1 mm, pubescent; bracts stipular, persistent. Calyx 2.5-5 × 1-2 mm, funnel shaped, pubescent, teeth short. Petals connate, 6-10 mm long, funnel shaped, pubescent, lobes 5, ovate-lanceolate. Stamens many, yellowish, monadelphous at the base, tube slightly shorter to or longer than the corolla tube. Ovary ca. 1.5 mm long, sessile, glabrous; style upto 3 cm long. Fruit a pod, 15-20 x 2.5 cm, strap shaped, flat, reddish-brown, glossy, straight or wavy along the margin, very shortly stalked, apices round or tapering, slightly bullate over the seeds; seeds 8-20, 6-10 x 5-8 mm, ovate, flat, dull brown.

Bhoothamkallu, *KJD 18715*

Fl. & Fr.: March-July

Distribution: Rare in Semi-evergreen forests of Bhoothamkallu.

Albizia lebbeck (L.) Benth. in Hook.'s London J. Bot. 3: 87. 1844; Hook. f., Fl. Brit. India 2: 298. 1878; Gamble, Fl. Pres. Madras 432(306). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 170. 1988; Sanjappa, Legumes Ind. 56. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 589. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 336. 2009. *Mimosa lebbeck* L., Sp.Pl.516. 1753. *Mimosa sirissa* Roxb., Fl. Ind. 2: 544. 1832.

Deciduous trees; to 25 m high; bark 20-25 mm thick, surface yellowish-brown, rough, deeply fissured, exfoliating in irregular semi brittle scales. Leaves bipinnate, alternate, pinnae 2-4 pairs, 5.5-12 cm long, slender, glabrous, opposite, even pinnate, leaflets 8-20, opposite, even pinnate, petiolule to 1 mm long, a gland in between each leaflets, 2.7-5 x 1-2.5 cm, obliquely oblong, base of one half cuneate, other round, apex obtuse, margin entire, glabrous above and slightly pubescent beneath, coriaceous; midrib towards distal margin, stipulate; stipules small, free, lateral, cauducous; rachis 7-9 cm long, slender, grooved above, with a gland at its base, glabrous, pulvinate; lateral nerves 6-8 pairs, pinnate, slender, prominent, intercostae reticulate. Flowers bisexual, greenish-white, in subglobose heads, 3.5-3.7 cm long, solitary or 2-4 together in axillary corymbose racemes; peduncle 6-8 cm; bracts linear, cauducous; pedicels to 3 mm. Calyx tube funnel-shaped pubescent, 3-4.5×1.5-3 mm, teeth triangular. Petals united infundibuliform 7-10 mm long, greenish, lobes 5, lanceolate, pubescent without. Stamens many, filament tube shorter than corolla tube, filaments long exserted, green or pink; anthers very small. Ovary subsessile, glabrous, style 2.5 cm, filiform; stigma minute. Fruit a pod 20-30 x 4-5 cm, flat, oblong, compressed, straw coloured,

base and apex obtuse, turgid above the seeded region; seeds 8-12, 6-10 x 5-8 mm, ovate, dull dark brown, flattened.

Paripode, *KJD 18781*

Fl. & Fr.: March-December

Distribution: Rare in Plantations of Kariyenkappu.

Albizia odoratissima (L. f.) Benth. in Hook.'s London J. Bot. 3: 88. 1844; Hook. f., Fl. Brit. India 2: 299. 1878; Gamble, Fl. Pres. Madras 431(306). 1919; Ansari, Fl. Kasaragod Div. 149. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 170. 1988; Sanjappa, Legumes Ind. 57. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 593. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 336. 2009. *Mimosa odoratissima* L. f., Suppl. Pl. 437. 1781. *Acacia odoratissima* (L.f.) Willd., Sp. Pl. 4: 1063. 1806.

Deciduous trees; to 30 m high; bark 10-15 mm thick, surface greyish-brown to dark brown, rough, irregularly cracked; branchlets blackish to brown, terete, 2-6 mm thick, initially tawny pubescent, finally glabrous. Leaves bipinnate, alternate, pinnae 2-8 pairs, opposite, even pinnate, 5-13 cm long, slender, puberulent, glands between the junctions of 1-2 distal pairs of pinnae, leaflets 14-40, opposite, even pinnate, sessile, 1.8-2.5 x 0.5-1.2 cm, oblong, apex obtuse and apiculate, base oblique, margin entire, glabrous, coriaceous; stipule free, lateral, caducous; rachis 20-30 cm long, stout, grooved above, spulvinate, brown pubescent, with a gland at the base; midrib subcentral to submarginal, lateral nerves 3-6 pairs, pinnate, slender, prominent, intercostae reticulate, prominent. Flowers bisexual, white, in globose heads forming terminal panicles; peduncle, slender, puberulous. Calyx tube cupular, 1-1.5 x 1-1.3 mm, teeth minute, deltoid, pubescent. Petals connate, broadly funnel shaped, lobes 5, ovate-lanceolate, pubescent. Stamens many, 1.2-2 cm long, monadelphous at base, tube as long as or shorter than the corolla tube. Ovary stipitate, glabrous or pilose, style filiform, stigma terminal. Fruit a pod 15-20 x 2.5-3.7 cm, flat, strap-shaped, with parallel margin or often some portion constricted, rounded to rostrate at apex, glabrous, often glossy, reddish-brown to dark brown, finely reticulately veined; seeds 6-12, oblong, orbicular, compressed.

Paripode, *KJD 22565*

Fl. & Fr.: April-January

Distribution: Rare in Semi-evergreen forests of Paripode.

Albizia procera (Roxb.) Benth. in Hook.'s London J. Bot. 3: 89. 1844; Hook. f., Fl. Brit. India 2: 299. 1878; Gamble, Fl. Pres. Madras 431(306). 1919; Sanjappa, Legumes Ind. 58. 1992; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 594. 1996; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 337. 2009. *Mimosa procera* Roxb., Pl. Corom. t. 121. 1798.

Deciduous trees; to 30 m high; bark 10-15 mm, thick, surface greenish-yellow, smooth, exfoliation small, irregular; branchlets brownish to blackish or yellowish, terete, 3-13 mm thick, silky pubescent. Leaves bipinnate, alternate, pinnae 2-5 (6) pairs, 9.7-27 cm long, slender, evenly pinnate, opposite, puberulous; leaflets 4-20, opposite, even pinnate, estipellate, petiolule 2-3 mm long; 2.5-5 x 1.8-3 cm, obliquely oblong, obliquely ovate or obliquely oblong-ovate, apex round or subacute, base unequal, round on the upper side of the midrib and acute on the lower side, margin entire, glabrous above, white pilose beneath, with a gland between terminal pairs of leaflets, subcoriaceous;

stipule free, lateral; rachis 13-30 cm long, slender, pulvinate, puberulous, with a prominent gland near its base; midrib subcentral, slightly towards the distal margin; lateral nerves 6-10 pairs, pinnate, slender, prominent, intercostae reticulate, obscure. Flowers bisexual, yellowish-white, in globose heads, forming axillary or terminal panicles. Calyx tube narrowly obconic, 2.5-3 x 1.5-2 mm, glabrous, teeth triangular. Petals connate, 5-7 mm long, 5-lobed; lobes oblong-elliptic, puberulous towards apex. Stamens many, 8-12 mm long, monadelphous at base, tube longer than the corolla tube. Ovary oblong, stipitate, glabrous, style filiform; stigma terminal. Fruit a pod 10-20 x 1.8-2.5 cm, strap-shaped, flat, thin walled, rostrate at apex, glabrous, often glossy, faintly reticulately veined, black, brown or yellow when dry, stalk very short; seeds 5-12, ovate-elliptic, compressed, greenish-brown.

Pookundu, *KJD 18778*

Fl. & Fr.: July-August

Distribution: Rare in Semi-evergreen forests of Pookundu.

ARCHIDENDRON F. H. Jacob von Mueller, *Fragm.* 5: 59. 1865.

1a. Large shrubs; staminal filament 1.5 cm long.....*A. monadelphum* var. *gracile*

1b. Trees; staminal filaments ca. 1 cm long*A. bigeminum*

Archidendron bigeminum (L.) Neilson, *Opera Bot.* 76: 73. 1985; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 338. 2009. *Mimosa bigemina* L., *Sp. Pl.* 517. 1753. *Archidendron monadelphum* (Roxb.) Nielson, *Adansonia* 19: 21. 1979; Sanjappa, *Legumes Ind.* 61. 1992. *Mimosa monadelpha* Roxb., *Fl. Ind.* 2: 544. 1832. *Pithecellobium bigeminum* (L.) Mart. ex Benth. in *Hook.'s London J. Bot.* 3: 206. 1844; Hook. f., *Fl. Brit. India* 2: 303. 1878; Gamble, *Fl. Pres. Madras* 435(308). 1919. *Pithecellobium monadelphum* (Roxb.) Kosterm., *Reinwardtia* 3: 11. 1954; Manilal & Sivar., *Fl. Calicut* 100. 1982; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 171. 1988; *Abarema bigemina* (L.) Kosterm., *Bull. Org. Sci. Res. Indonesia* 51, f. 34,35. 1954.

Evergreen trees; to 12 m high; bark reddish-brown, prominently lenticellate. Leaves bipinnate, alternate, pinnae 2, opposite, 11-13 cm long, slender, puberulent, a gland in between 2 pinnae; leaflets 4-8, opposite, with a gland in between every pair of leaflets, 6.5-12 x 2.5-5 cm, obovate, oblong or elliptic-acuminate, apex acuminate, base unequally acute, margin entire, puberulent above and below, chartaceous; stipules inconspicuous; rachis 10-11 cm long, slender, pulvinate, pubescent, with a gland near its base; lateral nerves 8-14 pairs, pinnate, prominent, secondary lateral also prominent; intercostae reticulate. Flowers bisexual, white, in globose heads in terminal and axillary panicles; bracteoles lanceolate, persistent. Calyx campanulate, 1.5 mm long, lobes 4, minute, acute. Petals 4, basally connate, 4 mm long, lobes ovate, acute, valvate. Stamens 4, monadelphous, much exerted. Ovary sessile; style filiform; stigma minute; ovules many. Fruit a pod 10 x 1.5-2 cm, twisted, strap-shaped, dehiscent, red within; seeds 3-8, ovoid, smooth, without aril, funicle filiform.

Chelachode, *KVB 31539*

Fl. & Fr.: March-April

Distribution: Common in Evergreen forests of Chavachi, Kariyenkappu to Moonamthode, Asthippara and Paripode.

Archidendron monadelphum (Roxb.) Nielson var. **gracile** (Bedd.) Sanjappa, *Legumes India* 62. 1992; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 338.

2009. *Pithecellobium gracile* Bedd., Madras J. Lit. Sci. ser. 3, 1: 44. 1864; Gamble, Fl. Pres. Madras 435(308). 1919; Ansari, Fl. Kasaragod Div. 151. 1985. *Abarema monadelphum* (Roxb.) Kosterm. var. *gracile* (Bedd.) Kosterm., Bull. Org. Natuur. Ord. Indonesia 20: 50. 1954.

Slender shrubs or small trees. Leaves bipinnate, alternate, pinnae 1, opposite, leaflets 2-6, opposite, 6.5-12 x 2.5-5 cm, ovate, caudate acuminate, base unequally acute, margin entire, chartaceous; stipules inconspicuous; rachis 10-11 cm long, slender, pulvinate, pubescent, with a gland near its base; lateral nerves 8-14 pairs, pinnate, prominent, secondary lateral also prominent; intercostae reticulate. Flowers bisexual, white, in globose heads in terminal panicles; bracteoles lanceolate. Calyx short campanulate, lobes 4. Petals 4, basally connate. Stamens 4, monadelphous, much exerted; ovary sessile, style filiform, stigma minute, ovules many.

Moonamthode, *KJD 31843*

Fl. & Fr.: October-March

Distribution: Fairly common in Evergreen forests of Moonamthode and Kattikari, Semi-evergreen forest of Paripode and Narikkadavu. Endemic to southern Western Ghats.

ENTADA Adanson, Fam. 2: 318, 554. 1763, *nom. cons.*

Entada rheedei Spreng., Syst. Veg. 2: 325. 1825 "rheedii"; Ramach. & V.J. Nair, Fl. Cannanore Dist. 170. 1988; Sanjappa, Legumes Ind. 66. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 339. 2009. *Mimosa entada* L., Sp. Pl. 518. 1753. *Entada pursaetha* DC., Prodr. 2: 425. 1825; Ansari, Fl. Kasaragod Div. 150. 1985. *Entada monostachya* DC., Prodr. 2: 425. 1825; M. Mohanan & Henry, Fl. Thiruvanthapuram 174 *Entada scandens* sensu Hook.f., Fl. Brit. India 2: 86. 1878, non Benth. 1841; Gamble, Fl. Pres. Madras 417(296). 1919.

Lianas, tendrillate, stems glabrous. Leaves bipinnate, pinnae 2 or 3 pairs, the terminal pair modified into a tendril; leaflets 4-7 pairs, 5 x 2.5 cm, curved-oblong, obtuse, inequilateral. Spikes to 35 x 0.8 cm, axillary, solitary or paired, erect. Flowers 3 mm long, densely packed, yellow. Calyx cupular, truncate. Petals 4, free, valvate; stamens 10, free; filaments 6 mm long, ovary many-ovuled; style slender; stigma concave. Pods to 1 m long, thick, woody, crenate on both sutures; seeds many, biconvex, 5 cm across, orbicular, smooth.

Kariyenkappu, *KJD 26369*

Fl. & Fr.: December-April

Distribution: Fairly common in Semi-evergreen forests of Kurukanthode, Kariyenkappu and Pothanplavu.

MIMOSA L., Sp. Pl. 516. 1753.

- 1a. Pinnae 1 or 2 pairs; stamens 4 *M. pudica*
1b. Pinnae 5 or 6 pairs; stamens 8 *M. diplotricha*

Mimosa diplotricha C. Wight ex Sanvalle, Anales Acad. Ci. Med. Habana 5: 405. 1868; Delin Wu & Ivan C. Nielsen, Flora China 10: 53. 2010. *Mimosa invisia* C. Mart., Flora 20: Biebl. 8: 121. 1837, non C. Mart. ex Colla 1834; Nair, Journ. Bombay Nat. Hist. Soc. 61:469.1964; Manilal & Sivar., Fl. Calicut 101. 1982; Sanjappa, Legumes Ind. 68. 1992.

Rambling shrubs, stem pubescent, prickles short, in 4-rows. Leaves to 10 cm long, pinnae opposite, to 5 cm long, leaflets to 35 pairs, to 5 x 1 mm, oblong, truncate at base, glabrous; rachis prickled. Head to 1.5 cm across, in terminal racemes, peduncled. Flowers many, 3 mm long, pink. Stamens 10, filaments 6 mm long. Pods 2-5 cm long, bristly, black when mature.

Paripode, *KJD 26250*

Fl. & Fr.: October-December

Distribution: Common near Farm as weed.

Mimosa pudica L., Sp. Pl. 518. 1753; Hook. f., Fl. Brit. India 2: 291. 1878; Gamble, Fl. Pres. Madras 421(298). 1919; Manilal & Sivar., Fl. Calicut 101. 1982; Ansari, Fl. Kasaragod Div. 150. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 171. 1988; Sanjappa, Legumes Ind. 69. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 340. 2009.

Straggling herbs; stem 4-angular, without prickles. Leaves alternate to 12 cm long, pinnae 5-10 pairs; leaflets ca 20 pairs, oblong, 3-7 by 0.75-1 mm, overlapping, apex acute-mucronate, base oblique-truncate; rachis, tomentose;. Flowers pink. Pod flat, margin with recurved prickles; seeds 3-5, subrhombic.

Narikkadavu, *KJD 26394*

Fl. & Fr.: July-January

Distribution: Along the boundaries of the Farm.

XYLIA Benth., in Hook.'s J. Bot. 4: 417. 1842.

Xylia xylocarpa (Roxb.) Taub., Bot. Centralbl. 47: 395. 1891; Gamble, Fl. Pres. Madras 417(295). 1919; Manilal & Sivar., Fl. Calicut 101. 1982; Ansari, Fl. Kasaragod Div. 152. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 172. 1988; Sanjappa, Legumes Ind. 73. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 341. 2009. *Mimosa xylocarpa* Roxb., Pl. Corom. t. 100. 1798. *Xylia dolabriformis* sensu Bedd., Fl. Sylv. t. 186. 1872, non. Benth. 1842; Hook. f., Fl. Brit. India 2: 286. 1878 p.p.

Deciduous trees; to 20 m high; bole often fluted; bark 10-15 mm thick, reddish-brown, mottled with white, rough, exfoliations irregular; brittle. Leaves bipinnate, alternate, pinnae 2, opposite, even pinnate 8-30 cm, slender, glabrous, leaflets 4-18, opposite, with a gland between each pairs; 5-33.5 x 2.5-6 cm, oblong-acuminate, elliptic or elliptic-oblong, apex acute or acuminate, base obtuse or acute, margin entire, glabrous, coriaceous; stipules small, free, lateral, deciduous; rachis 4-18 cm long, stout, glabrous, pulvinate, with an orbicular gland at tip; lateral nerves 6-12 pairs, pinnate, prominent; intercostae reticulate. Flowers bisexual, sessile, dull yellow, in axillary globose heads; bracteole club shaped. Calyx 4 mm long, tubular, 5-toothed. Petals 5, 1.5 cm long, linear, slightly connate at base, valvate. Stamens 10, free, exserted, filaments slender; anthers tipped with a stalked gland which is early deciduous. Ovary sessile, style filiform; stigma terminal. Fruit a pod 10-15 x 5-6 cm, flat, broadly falcate, woody, compressed, dehiscent, septate between the seeds; seeds 4-10, oblong, compressed, brown, shining.

Narikkadavu, *KJD 22510*

Fl. & Fr.: February-December

Distribution: Fairly common in Semi-evergreen forests of Narikkadavu to Bhoothamkallu.

ROSACEAE

- 1a. Scandent prickly shrubs; ovaries many, free *Rubus*
1b. Erect unarmed trees; ovaries 1-3, united *Prunus*

PRUNUS L., Sp. Pl. 473. 1753

Prunus ceylanica (Wight) Miq., Fl. Ind. Bot. 1: 366. 1855; Ansari, Fl. Kasaragod Div. 152. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 172. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 341. 2009. *Polydontia zeylanica* Wight, Illustr. 1: 203. 1840, "Polyodontia". *Pygeum zeylanicum* Bedd., Fl. Sylv. t. 59. 1871. *Pygeum acuminatum* Colebr., Trans. Linn. Soc. London 12: 300. t.18. 1818; Hook. f., Fl. Brit. India 2: 318. 1878; Gamble, Fl. Pres. Madras 439(311). 1919, non *Prunus acuminata* (Wall.) Dietr. 1803. *Pygeum wightianum* Blume ex Muell. in Walp., Ann. 4: 642. 1857; Hook. f., Fl. Brit. India 2: 319. 1878; Gamble, Fl. Pres. Madras 439(311). 1919. *Pygeum gardneri* Hook. f., Fl. Brit. India 2: 321. 1878; Gamble, Fl. Pres. Madras 439(311). 1919. *Pygeum sisparensense* Gamble, Bull. Misc. Inform. Kew 1918: 238. 1918; Gamble, Fl. Pres. Madras 438(311). 1919.

Evergreen trees, to 25 m high, bark 6-8 mm thick, brownish-black, rough, vertically fissured and shallowly horizontally cracked forming thin tessellate flakes; branchlets prominently lenticellate. Leaves simple, alternate, 10-21 x 4.5-8.5 cm, ovate, ovate-lanceolate, oblong-lanceolate, or elliptic-ovate, apex acuminate or obtusely acute, base acute, round or oblique, margin entire, glabrous, coriaceous; stipules small, lateral, cauducous; petiole 10-22 mm, stout, grooved above, glabrous; lateral nerves 5-9 pairs, pinnate, prominent, slender, intercostae reticulate, prominent, 2 pitted glands at base on either side of the midrib often present. Flowers bisexual, 5-6 mm across, white, in axillary racemes; bracts forming a cone in buds, deciduous. Calyx tube campanulate; lobes 5-6, ovate, acute or obtuse, densely hairy; petals 5-6, oblong, tomentose without. Stamens 20-30; filaments slender, incurved; anthers small. Ovary sessile, inferior, 1-celled, glabrous, ovules 2, pendulous; style 1, subulate; stigma capitate. Fruit a drupe 20-25 x 35-37 mm, depressed globose, obscurely 2-lobed, glabrous; seeds 2, globose.

Near Pottichapara, *KJD 26326*

Fl. & Fr.: September-April

Distribution: Rare along streamside at Pottichapara.

RUBUS L., Sp. Pl. 492. 1753.

- 1a. Leaves 3-foliolate; bracts ovate, acute *R. ellipticus*
1b. Leaves simple; bracts divided into linear lobes *R. glomeratus*

Rubus ellipticus Smith in Rees, Cyclop. 30: Rubus. n.16. 1815; Hook. f., Fl. Brit. India 2: 336. 1878; Gamble, Fl. Pres. Madras 441(313). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 342. 2009. *Rubus gowreepful* Roxb., Fl. Ind. 2: 517. 1832. *Rubus wallichianus* Wight & Arn., Prodr. 298. 1834.

Ramblers; stems covered with red bristles; prickles recurved. Leaves alternate; leaflets 5 x 5 cm, obovate to orbicular, serrulate; hispid below; nerves 7 or 8 pairs, spiny below; petiolule 5 mm long. Panicle axillary or terminal, fulvous tomentose; bracts 5 mm long, ovate, acute. Flowers white; pedicels 1 cm long, villous. Sepals 6 x 4 mm, ovate, acute, united at base, pubescent. Petals 7-8 mm long, obovate; torus densely villous; ovaries glabrous. Drupes 1.5 mm across, glabrous, deep red.

Ambalappara, NS & KVB 31369

Fl. & Fr.: November-March

Distribution: Fairly common in Evergreen forests of Ambalappara.

Rubus glomeratus Blume, Bijdr. 1111. 1826; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 343. 2009. *Rubus fulvus* Focke, Biblioth. Bot. 17: 81. 1911, non Sudre 1902; Gamble, Fl. Pres. Madras 441(313). 1919. *Rubus moluccanus* sensu Hook. f., Fl. Brit. India 2: 330. 1878 p.p., non L. 1753.

Rambling shrubs, stem reddish, densely cottony hairy. Leaves alternate, to 8 x 8 cm, shallowly 5-lobed, cordate at base, rugose above, densely fulvous, cottony tomentose below; petiole 4 cm long. Flowers in terminal panicles, bracts 8 mm long, densely hairy; bracteole bifid, filiform; pedicels 7 mm long. Sepals 10 mm long, united below. Petals 4 x 2 mm, obovate. Ovaries glabrous. Drupe 2 mm across, ovoid, yellow.

Ambalappara, KJD 25464

Fl. & Fr.: October-January

Distribution: Rare in Grasslands of Ambalappara. Endemic to Peninsular India.

PARNASSIACEAE

PARNASSIA L., Sp. Pl. 1: 273. 1753.

Parnassia mysorensis Heyne ex Wight & Arn., Prodr. 35. 1834; Hook. f., Fl. Brit. India 2: 402. 1878; Gamble, Fl. Pres. Madras 448(317). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 344. 2009.

Small scapigerous herbs. Leaves simple, radical, orbicular to reniform, base cordate, 0.75-1.5 cm diam; petioles 1-4.5 cm long. Flowers solitary on scape, 6-12 cm long. Scape with a leafy bract at middle. Calyx broadly campanulate, 0.3-0.35 cm long, lobes 5, broadly ovate. Petals 5, white, broadly ovate, 0.4-0.5 x 0.2-0.25 cm. Stamens 5; staminodes 5, alternating with stamens. Ovary 0.3-0.4 cm long, ovoid, 1-celled; ovules many; style short; stigma 3-4. Capsules ovoid, 0.4-0.5 x 0.2-0.25 cm, 3-4 valved; seeds minute, many.

Ambalappara, KJD 25439

Fl. & Fr.: September-December

Distribution: Fairly common on wet rocks in Evergreen forests of Ambalappara.

CRASSULACEAE

KALANCHOE Adans., Fam. 2: 248. 1763.

Kalanchoe lanceolata (Forssk.) Pers., Syn. 1: 446. 1805. *Cotyledon lanceolata* Forssk., Fl. Aeg.-Arab. 89. 1775. *Kalanchoe floribunda* Wight & Arn., Prodr. 359. 1834; Hook. f., Fl. Brit. India 2: 414. 1878; Gamble, Fl. Pres. Madras 450(319). 1919.

Large perennial, succulent, deciduous, glabrous herbs. Leaves opposite, fleshy, rounded or obtuse, crenate-serrate. Flowers yellow, in large trichotomous corymbose cymes; bracts linear-lanceolate. Calyx glabrous, divided nearly to the base; segments narrowly lanceolate, acute. Corolla yellowish-white, tube inflated, glabrous; lobes broadly lanceolate, acute. Stamens 8, in two series, adnate to the corolla tube. Carpels 4, adnate to the

base of corolla tube, styles subulate, stigma oblique. Fruits with persistent shining white corolla tubes.

Ambalappara, *KVB 31669*

Fl. & Fr.: January-June

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Peninsular India.

DROSERACEAE

DROSERA L., Sp. Pl. 218. 1753.

- 1a. Leaves radical, spatulate *D. burmannii*
1b. Leaves cauline, not spatulate 2
2a. Leaves peltate, semi-lunate; flowers white *D. peltata*
2b. Leaves linear, terete; flowers pink *D. indica*

Drosera burmannii Vahl, Symb. Bot. 3: 50. 1794; Hook. f., Fl. Brit. India 2: 424. 1878; Gamble, Fl. Pres. Madras 452(320). 1919; Manilal & Sivar., Fl. Calicut 103. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 174. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 346. 2009.

Acaulescent herbs. Leaves to 10 x 8 mm, obovate, obtuse, prostrate, densely covered with glandular hairs, greenish pink; petiole absent. Flowers few in erect racemes; scape 6-8 cm high. Calyx glandular. Petals 3 mm across, white. Stamens 5. Ovary ovoid; style apically lobed. Capsule 6 x 4 mm, obovoid; seeds black.

Ambalappara, *NS & KJD 31952*

Fl. & Fr.: August-December

Distribution: Common along stream sides and moist areas in Evergreen forests of Ambalappara.

Drosera indica L., Sp. Pl. 282. 1753; Hook. f., Fl. Brit. India 2: 424. 1878; Gamble, Fl. Pres. Madras 452(320). 1919; Manilal & Sivar., Fl. Calicut 103. 1982; Ansari, Fl. Kasaragod Div. 153. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 347. 2009.

Herbs with weak erect, sometimes decumbent, slightly branched, glandular-pubescent stems, usually 4.5-25 cm long. Leaves many, cauline, alternate, narrowly linear, glandular hairy, about 2.5-6.0 cm long, hardly broader than the petiole, circinate in veneration; petioles glabrous, about 1.5 cm long; stipules absent; the young leaves in the upper region of the stem erect and circinate, the mature leaves in the mid-region of the stem spreading and horizontal, the oldest leaves towards the basal region of the stem usually deflexed and supporting the weak stem in the manner of stilt-roots. Flowers mauve or pinky purple, usually over 1.5 cm across, 3-15 on axillary, terminal and leaf-opposed glandular racemes usually 5.5-10.5 cm long. Calyx segments oblong-ovate, subobtuse, entire, glandular-pubescent. Petals narrowly spatulate, obtuse. Styles 3. Capsule broadly oblong; seeds minute, ovoid, reticulate.

Chullikandam, *KJD 22508*

Fl. & Fr.: August-November

Distribution: Rare in Semi-evergreen forests of Chullikandam.

Drosera peltata Smith in Willd., Sp. Pl. 1: 1546.1797; Hook. f., Fl. Brit. India 2:424.1878; Gamble, Fl. Pres. Madras 452(320). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 347. 2009.

Herbs with subterranean globose tuber, solid, smooth, about 0.5 cm in diameter; stems erect, 15.3 cm high, occasionally with a branch or two near the top, glabrous. Leaves alternate, many, along the whole length of the stem, with a very slender curved subcapillary petiole 1.0-2.5 cm long; leaf blade peltately attached, semicircular, with the upper edge straight or slightly concave and prolonged at the corners into acuminate horns, thus giving the blade a semilunate outline, carrying on its adaxial surface numerous long, viscid stipitate glands. Inflorescens terminal or lateral, 1-5 cm long, usually 2-8 flowered; flowers white, nearly 1.5 cm across; pedicels 0.8-1.5 cm long. Calyx segments ovate, glabrous but lacinate or ciliate at the margins. Petals white, spatulate-obovate. Ovary globose; styles 3, fimbriate towards the apex. Capsule 7 x 4 mm, ovoid; seeds oblong, black.

Ambalappara, NS & KJD 31968

Fl. & Fr.: December-March

Distribution: Common in Grasslands as well as forests of Ambalappara.

RHIZOPHORACEAE

1a. Bracteoles present; leaf margins entire, revolute Carallia

1b. Bracteoles absent; leaf margins crenate, not revolute Blepharistemma

BLEPHARISTEMMA Wall. ex Benth., J. Proc. Linn. Soc., Bot. 3: 73. 1858

Blepharistemma serratum (Dennst.) Suresh in Nicolson et al., Interp. Hort. Malab. 214. 1988; Sasidh. & Sivar., Fl. Pl. Thrissur For. 174. 1996. *Rodschiedia serrata* Dennst., Schluss. Hort. Malab. 16, 24, 31. 1818. *Gynotroches membranifolia* Miq., Anal. Bot. Ind. 3: 7. 1852. *Blepharistemma corymbosum* Benth., J. Proc. Linn. Soc. Bot. 3: 65, 78. 1858; Hook. f., Fl. Brit. India 2: 441. 1878; Gamble, Fl. Pres. Madras 460(326). 1919. *Blepharistemma membranifolia* (Miq.) Ding Hou in Steenis, Fl. Males. ser. 1, 5: 489. 1958; N.C. Nair & Mohanan, Journ. Econ. Tax. Bot. 2:233.1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 175. 1988; Mohanan & Sivad., Fl. Agasthyamala 246. 2002.

Bark yellowish-brown, smooth, lenticellate; branchlets lenticellate; young shoots pubescent. Leaves simple, opposite, decussate, 4.5-15 x 2-7 cm, elliptic, elliptic-oblong or oblong, base acute or attenuate; glabrous, membranous; stipules interpetiolar, cauducous; petiole 6-10 mm long, slender, pubescent; lateral nerves 5-9 pairs, slender, pinnate, prominent, intercostae reticulate, obscure. Flowers polygamodioecious, 4 mm across, white, in many flowered axillary cymes; bracteoles absent. Calyx tube campanulate, adnate to the base of the ovary, lobes 4, erect. Petals 4, clawed, spatulate, lacerate at apex, white, inserted around a 8-lobed disc, disc lobes long in male short in bisexuals. Stamens 8, inserted on the margin of the disc, small in female, filaments ciliate, anthers oblong. Ovary 3-celled; ovules 2 in each cell; style short in males, longer in female; stigma shortly 3-lobed. Fruit a 3-valved capsule, 6 mm across, yellowish, subglobose, acute; seeds covered with yellow aril.

Kattikari, KJD 18743

Fl. & Fr.: February-July

Distribution: Rare in Evergreen forests of Kattikari. Endemic to southern Western Ghats; Conservation status: Vulnerable.

CARALLIA Roxburgh, Pl. Coromandel 3: 8. 1811, *nom. cons.*

Carallia brachiata (Lour.) Merr., Philipp. J. Sci. 15: 249. 1919; Manilal & Sivar., Fl. Calicut 104. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 175.

1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 347. 2009. *Diatoma brachiata* Lour., Fl. Cochinch. 296. 1790. *Carallia integerrima* DC., Prodr. 3: 33. 1828; Gamble, Fl. Pres. Madras 459(325). 1919.

Evergreen trees; to 25 m; bark 10-12 mm thick, dark grey, corky, furrowed, prominently pustular-lenticellate; blaze pink, petiole 6-10 mm stout, glabrous; Leaves simple, opposite, 4-11 x 2-7 cm, obovate, or obovate-oblong, apex acute or obtuse, base attenuate or acute, margin entire, recurved, coriaceous, glabrous and glossy; lateral nerves 6-10 pairs, slender, pinnate, obscure, secondary laterals present; intercostae reticulate, obscure. Flowers bisexual, cream coloured, sessile, small, in short, trichotomous axillary branching cymes; bracteoles minute, calyx tube campanulate, lobes 5-8, ovate, acute, valvate; petals 5-8, clawed, orbicular-cordate, margin deeply lacerate, reddish, inserted on a crenulate disc; disc 10-16 lobed; stamens 10-16, inserted with them on the disc, one of each pair opposite the petal, slightly longer than the other filament, which is opposite to a sepal; filaments filiform; anthers small; ovary half inferior, 3-5-celled; ovules 2 in each cell; style subulate; stigma 4-lobed. Fruit a drupe, 5-6 mm across, red, filiform; seed one, bright orange, subreniform.

Chavachi, KJD 26050

Fl. & Fr.: October-April

Distribution: Rare in Evergreen forests of Chavachi.

COMBRETACEAE

- 1a. Scandent or climbing shrubs..... 2
- 1b. Erect trees Terminalia
- 2a. Flowers in cymes, petals five Quisqualis
- 2b. Flowers in panicle, petals four or absent..... 3
- 3a. Flowers in pendulous panicle, petals four Combretum
- 3b. Flowers in erect or axillary panicle, petals absent Calycopteris

CALYCOPTERIS Lam., Tabl. Encycl. t. 35; 2(2): 485, t. 357. 1793.

Calycopteris floribunda Lam., Tabl. Encycl. 2: 485. t. 357.1793; Hook. f., Fl. Brit. India 2: 449.1878; Gamble, Fl. Pres. Madras 467(331). 1919; Manilal & Sivar., Fl. Calicut 105. 1982; Ansari, Fl. Kasaragod Div. 155. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 176. 1988; Gangop. & Chakrab., Journ. Econ. Tax. Bot. 21: 294. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 349. 2009. *Getonia floribunda* (Lam.) Roxb., Fl. Corom. t.87. 1798.

Scandent shrubs; young stem densely brown pubescent. Leaves 4-9 x 2-3 cm, ovate to elliptic, apex acute or acuminate-caudate, base rounded, densely pubescent on both sides, more below, punctate; petiole to 1 cm long. Flowers in dense axillary racemes, crowded in dense panicles at top of branches. Bracts leafy, 0.6-1.2 x 0.3-0.4 cm. Calyx tube 4-5 mm long; lobes 5, to 5 mm long elliptic cream coloured, velvety, accrescent. Petals absent. Stamens 10, 5+5 in two rows. Ovary inferior, 3-4 mm long, 1-celled; ovules 3, pendulous; stigma simple. Drupe 6-8 mm long, with 5 spreading accrescent calyx lobes; seed single.

Paripode, KJD 22586

Fl. & Fr.: January-May

Distribution: Semi-evergreen forests of Paripode.

COMRETUM Loefl., Iter Hispan 308. 1758, *nom. cons.*

- 1a. Petals 4, pendulous panicles..... *C. latifolium*
- 1b. Petals 5, Erect cymes 2
- 2a. Petals recurved *C. recurvatum*
- 2b. Petals not recurved *C. malabaricum*

Combretum latifolium Blume, Bijdr. 641. 1826; Manilal & Sivar., Fl. Calicut 105. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 177. 1988; Gangop. & Chakrab., Journ. Econ. Tax. Bot. 21: 311. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 349. 2009. *Combretum extensum* Roxb. ex G. Don, Trans. Linn. Soc. London 15: 414. 1827; Hook. f., Fl. Brit. India 2: 458. 1878; Gamble, Fl. Pres. Madras 469(332). 1919.

Climbing shrubs; young branchlets pale-brown scaly mixed with minute rufous, globular glands, becoming glabrous. Leaves opposite or sub opposite, 7-12 x 3.5-6 cm, elliptic-obovate to oblong-elliptic, apex obtusely acuminate, base cuneate, subcoriaceous; petiole to 1.5 cm long. Inflorescence of long-peduncled axillary spikes, forming terminal pendulous panicles. Flowers 4-merous, subsessile, greenish-white, polygamo-dioecious. Receptacle 4-5 mm long, funnel-shaped from above the ovary. Sepals 4, c. 2 x 1.5 mm, triangular. Petals 4, c. 2 x 2 mm, rounded, greenish-yellow. Stamens 8; filaments c. 3 mm long. Ovary linear, 1-locular; ovules 2-3, pendulous. Drupe 3-3.5 cm long, with 4 membranous wings, c. 1 cm wide, transversely striate.

Kariyenkappu, KVB 31506

Fl. & Fr.: December-April

Distribution: Common in Plantations of Kariyenkappu and Evergreen forests of Chavachi and Meenmutty.

Combretum malabaricum (Bedd.) Sujana, Ratheesh, & Anil, J. Bot. Res. Inst. Texas 6(2): 453. 2012

Quisqualis malabarica Bedd., Ic. t. 155. 1868-1874; Hook. f., Fl. Brit. India 2: 460. 1878; Gamble, Fl. Pres. Madras 469(332). 1919; Gangop. & Chakrab., J. Econ. Tax. Bot. 21: 332. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 350. 2009.

Climbing shrubs. Leaves alternate or opposite, to 14 x 5 cm, oblong, acuminate at apex; nerves 8 pairs, looping below the margins, domatia hairy; petiole 5 mm long. Flowers in terminal cymes. Calyx tube 15 mm long, produced above the ovary, narrow, hispid outside, lobes 5, 3 x 1 mm. Petals 12 x 3 mm, oblong, reddish. Stamens 10, filaments short. Ovary 1-celled, ribbed, pubescent; ovules 3-4, pendulous; style adnate to the calyx tube. Fruit 5-winged.

Chavachi, KVB 31528

Fl. & Fr.: February-April

Distribution: Common in Plantations of Kariyenkappu, Evergreen forests of Chavachi, Chelachode and Monamthode, Semi-evergreen forests of Paripode and Narikkadavu.

Endemic to southern Western Ghats.

Combretum recurvatum Sujana, Ratheesh, & Anil, J. Bot. Res. Inst. Texas 6(2): 453. 2012

Woody climber, young branchlets puberulous, purplish, terete. Leaves simple, opposite, 4-15 x 4-7 cm, ovate to oblong, membranous, glabrous above, lead-coloured when dry, brown beneath, apex shortly acuminate or acute, base rounded, margins entire to undulate with tawny hairs, lateral veins 5-8 pairs, slender, adaxially faint. Inflorescence terminal, spicate, 18-26-flowered; peduncles slender, purplish, puberulous, 7-11 cm long; bracteoles linear-lanceolate or triangular, ca. 5 x 1 mm, tomentose, deciduous. Flowers 5-merous, 1.5-1.7 x 1.5-1.6 cm; pedicels 0-1 mm long, puberulous. Calyx tube pale green, narrowly infundibuliform, ridged, 0.9-1 cm long, puberulous; teeth

triangular, ca. 3 × 2 mm, ciliolate, apex recurved. Petals white, turning pink with age, ovate or oblong, 13-14 × 6.8-7 mm, recurved with 3 distinct nerves, glabrous, apex obtuse. Stamens 5 + 5, inserted in the throat of the calyx tube; filaments ca. 1 mm long, white; anthers yellow, basifixed, ca. 1 × 0.7 mm. Ovary 4-5 × 1-1.2 mm, tawny puberulous, ridged, 1-celled with 3 ovules; upper free portion of style 1-2 mm long, yellowish white, slender, flattened; stigma capitate, creamy white. Fruits chocolate brown, chartaceous, 2-2.3 × 1.8-2.2 cm, villous when young, glabrous when mature, horizontally faintly striate, widely ellipsoid; stalk ca. 1 mm long, wings 5, thin, 10-12 mm broad. Seed solitary, fusiform, ca. 1.3 × 0.5 cm. Funicle ca. 6 mm long, curved; testa brown, membranous.

Chavachi, KVB 26104

Fl. & Fr.: January-May

Distribution: Evergreen forests of Chavachi, Chelachode and Monamthode. Endemic to southern Western Ghats.

TERMINALIA L., Syst. Nat. ed. 12, 2: 674. 1767, *nom. cons.*

- 1a. Fruits winged..... *T. paniculata*
 1b. Fruits wingless..... *T. bellirica*

Terminalia bellirica (Gaertn.) Roxb., Pl. Corom. t. 198. 1805; Hook. f., Fl. Brit. India 2: 445. 1878; Gamble, Fl. Pres. Madras 463(328). 1919; Manilal & Sivar., Fl. Calicut 105. 1982; Ansari, Fl. Kasaragod Div. 156. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 178. 1988; Gangop. & Chakrab., Journ. Econ. Tax. Bot. 21: 338. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 351. 2009. *Myrobalanus bellirica* Gaertn., Fruct. 2: 90. t. 97. ff. a-d.1791, "bellerica".

Deciduous trees, to 35 m high, bole often buttressed; bark 10-20 mm thick, surface blackish-grey, smooth, vertically shallowly fissured, exfoliations small, semi-fibrous; branches sympodial; branchlets terete, thinly fulvous-hairy, leaf scars prominent. Leaves simple, opposite or alternate, clustered at the tip of branchlets, 9-35 × 5-16 cm, obovate, elliptic or obovate-elliptic, apex obtusely acuminate, base obliquely cuneate, attenuate or acute, margin entire, both surface pubescent when young, glabrous at maturity, coriaceous, eglandular; petiole 15-80 mm, stout, slightly grooved above, glabrous; lateral nerves 7-10 pairs, pinnate, prominent; intercostae reticulate. Flowers bisexual, greenish-yellow, 5-6 mm across, in axillary spikes; peduncle puberulous; bracteoles 0.5-2 mm long, linear-lanceolate, caduceous. Calyx tube 2-2.5 × 1.3-2 mm, rusty pubescent, constricted above the ovary; lobes 5, cream, triangular, tomentose; disc 5-lobed, villous. Petals absent. Ovary 1.5 mm, inferior, tomentose, 1-celled; ovules 2 or 3, pendulous; style 4 mm, subulate; stigma small. Fruit a drupe 2-2.5 × 1.8 cm, obovoid, obscurely 5-ridged, yellowish-brown, honed, not winged, softly tomentose; seed one, ellipsoid.

Pothanplvu, KJD 22535

Fl. & Fr.: December-January

Distribution: Common in Semi-evergreen forests of Valayamchal, Narikkadavu and Pothanplavu.

Terminalia paniculata Roth, Nov. Pl. Sp. 383.1821; Hook. f., Fl. Brit. India 2:448.1878; Gamble, Fl. Pres. Madras 465(329). 1919; Manilal & Sivar., Fl. Calicut 104. 1982; Ansari, Fl. Kasaragod Div. 157. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 179. 1988; Gangop. & Chakrab., Journ. Econ. Tax. Bot. 21: 357.

1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 353. 2009. *Pentaptera paniculata* (Roth) Roxb., Fl. Ind. 2: 442. 1832.

Deciduous trees, to 30 m high, bole often fluted; bark 15-20 mm thick, surface brown, rough, vertical fissures shallow, fibrous; young parts silky pubescent; branchlets reddish. Leaves simple, lower leaves subopposite, upper alternate, 10-24 x 5-10 cm, elliptic, oblong, ovate, elliptic-oblong or ovate-oblong, apex acute or acuminate, base round, obtuse, cordate or oblique, margin entire, rusty pubescent when young and glabrescent when mature, coriaceous, 2 sessile glands beneath the base of the lamina or at the junction of petiole and lamina; petiole 12-15 mm long, stout, slightly grooved above, glabrous; lateral nerve 5-15 pairs, pinnate, prominent, arched towards the margin, prominent, intercostae reticulate, obscure. Flowers bisexual, white, sessile, 6-12 mm across, in axillary and terminal panicles, tomentose; bracteoles 2-5 mm, linear-lanceolate, recurved. Calyx tube 1-1.2 x 0.8-1 mm, constricted above the ovary, pubescent, lobes 5, cream, triangular, villous within. Petals 0. Stamens 10 in 2 rows; filaments 3-4 mm; disc 5-lobed, villous. Ovary 1 mm, inferior, 1-celled; ovules 2 or 3, pendulous; style to 4 mm, subulate, stigma terminal. Fruit a drupe 13 x 12 mm, reddish-brown, rusty tomentose, with one large and 2 small wings; seed one.

Paripode, NS & KVB 31451

Fl. & Fr.: August-February

Distribution: Deciduous forests of Paripode.

MYRTACEAE

- 1a. Leaves alternate; bark peeling 2
- 1b. Leaves opposite, bark not as above 3
- 2a. Fruits small, capsule Eucalyptus
- 2b. Fruits small, berry Psidium
- 2a. Calyx tube produced above the ovary Syzygium
- 2b. Calyx tube not produced above the ovary Eugenia

EUCALYPTUS L'Hér., Sert. Angl. 18. 1789.

Eucalyptus tereticornis Smith, Spec. Bot. New Holl. 41. 1795 & Trans. Soc. London 3:284.1797; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 365. 2009.

Trees, to 25 m high, bark white, smooth; branchlets apically angular, pubescent when young. Leaves simple, alternate, [seedling leaves opposite] seedling leaves 5-12.5 x 1.5-6 cm; juvenile leaves 12-22 x 4.5-10 cm; adult leaves 10-20 x 1-2 cm, ovate, elliptic, lanceolate or linear-lanceolate, apex acuminate, base subacute, cuneate or oblique, margin entire, glabrous, coriaceous, gland-dotted; petiole to 25 mm long, stout, glabrous; lateral nerves many, pinnate, faint, lopped near the margin forming intramarginal nerve, intercostae reticulate. Flowers bisexual, white, 1.5 cm across, in 7-11 flowered axillary umbels; pedicel to 1 cm. Hypanthium campanulate, 3.5 cm, rugose; operculum conical, 1-1.5 cm, horn-shaped, apex acute. Stamens many; filaments unequal. Ovary inferior, adnate to the hypanthium, 3-4-celled, ovules many; style simple, stigma capitate. Fruit a capsule, 6-8 x 4-5 mm, pedicellate, truncate-globular, disc ascending; seeds many.

Moonamkooppu, KJD 26372

Fl. & Fr.: March-September

Distribution: Eucalyptus plantation at Moonamkooppu.

EUGENIA L., Sp. Pl. 470. 1753.

- 1a. Leaves lanceolate, long acuminate, silvery beneath *E. argentea*
- 1b. Leaves suborbicular, glabrous *E. codyensis*

Eugenia argentea Bedd., Fl. Sylv. Anal. Genp. 109. 1872; Hook. f., Fl. Brit. India 2: 503. 1879; Gamble, Fl. Pres. Madras 484(342). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 354. 2009; Narayanan *et al.*, J. Econ. Tax. Bot. 34: 501. 2010.

Shrub or small trees. Leaves simple, opposite, 10-12 x 1.5-3 cm, lanceolate, long-acuminate, rounded at base, silvery-pubescent beneath; lateral nerves prominent, rather distant, at right angles to midrib; short-petioled. Flowers fascicled in the leaf-axils or in very short cymes; bracteoles 2, filiform, conspicuous under the calyx-tube. Pedicels 1-2.5 cm long. Calyx-tube nearly globose, not produced beyond the ovary, the limb of 4, rarely 5, persistent lobes. Petals 4, rarely 5, distinct. Stamens numerous, distinct, staminal disk not enlarged. Ovary 2-celled, ovules several in each cell; style slender; stigma simple. Fruit globose, shortly appressed-pubescent about 1.5 cm in diameter.

Mullenpara, NS & KVB 31359; Pothurumi, KVB 31662;
Asthippara KVB 31623

Fl. & Fr.: January-March

Distribution: Common in Evergreen forests of Mullenpara, Ambalappara, Pothurumi and Kattikari. Endemic to South India.

Eugenia codyensis Munro ex Wight, Ill. Ind. Bot. 2: 13 1841. *Eugenia cotinifolia* ssp. *codyensis* (Munro ex Wight) P.S.Ashton, Revised Handb. Fl. Ceyl. 2: 412. 1981. *Syzygium codyensis* (Munro ex Wight) Chandrash., Biol. Membr. Abstr. 2: 57. 1977.

Much branched small trees, bark rough silvery-grey; twigs terete, pale grey, rapidly becoming stout. Leaves simple, opposite, 3-6 x 2-5 cm, broadly elliptic to suborbicular, thickly coriaceous, concave, drying chocolate-brown beneath, apex retuse, obtuse, or subacute, base broadly cuneate, margin prominently revolute; nerves ca 8 pairs, very slender, ascending, hardly elevated on either surface; intramarginal nerve ca 1 mm within margin, ± obscure; tertiary nerves obscure; midrib stoutly prominent beneath; petiole 5-10 mm long, stout. Flowers white to pale yellow, solitary, axillary; pedicels 3.5 cm long, very slender. Calyx 8 mm diam., 7 mm long, shallowly cup-shaped, puberulent, with 4, 7 mm long and broad, prominent segments forming a 20 mm diam. ring. Petals 15 x 10 mm, elliptic-spathulate, obtuse, very large. Stamens ca 10 mm long. Fruit 2.5 cm diam., globose, ripening green flushed with crimson, with prominent ca 12 mm terminal rim bearing the persistent calyx segments.

Ambalappara, KJD 26334; Pothurumi KVB 31665, 31618

Fl. & Fr.: December-June

Distribution: Common in Evergreen forests of Mullenpara to Ambalappara and Pothurumi.

PSIDIUM L., Sp. Pl. 470. 1753.

Psidium guajava L., Sp. Pl. 470. 1753; Hook. f., Fl. Brit. India 2: 468. 1878, "guayava"; Gamble, Fl. Pres. Madras 472(334). 1919; Manilal & Sivar., Fl. Calicut 108. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 184. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 365. 2009.

Small trees; stem smooth with peeling bark; young stem 4-angled. Leaves simple, opposite, 16-11 x 2.5-5 cm, elliptic-oblong, apex acute-apiculate, base rounded to obtuse-cuneate, hirsute on both sides when young, glabrous on

ageing except the nerves, thin-coriaceous; lateral nerves prominent; petioles 0.6-1 cm long. Cymes axillary, 1-3-flowered; peduncles 0.5-1.2 cm long; pedicel short or 0. Calyx tube 4-9 mm long, ovoid, densely hirsute; lobes 4, united and closed in bud. Petals 4, white, 1-1.5 cm long, broadly ovate, caducous. Stamens many. Ovary globose, many-celled; ovules numerous; style subulate. Berry 3-4 cm diam., globose crowned by persistent calyx lobes; seeds many, embedded in fleshy pulp.

Kariyenkappu, *KJD 26293*

Fl. & Fr.: March-May

Distribution: Paanted in Kariyenkappu and Pothanplavu.

SYZYGium R. Br. ex Gaertn, Fruct. 1: 166. 1788.

- 1a. Flowers more than 1 cm 2
- 1b. Flowers less than 1 cm 5
- 2a. Leaves cordate at base 3
- 2b. Leaves acute or acuminate at base 4
- 3a. Reproductive shoots quadrangular *S. munronii*
- 3b. Reproductive shoots terete *S. aqueum*
- 4a. Pedicels 2-2.5 cm, flowers 4-5 cm across *S. laetum*
- 4b. Pedicels less than 1 cm, flowers 3 cm across *S. hemisphericum*
- 5a. Shrubs or very small trees *S. salicifolium*
- 5b. Trees 6
- 6a. Mature fruits red, ovoid to turbinate *S. lanceolatum*
- 6b. Mature fruits black, oblong ovoid or globose 7
- 7a. Calyx funnel-shaped; fruit globose *S. caryophyllatum*
- 7b. Calyx turbinate; fruit ovoid or oblong 8
- 8a. Inflorescence terminal only; lateral nerves close together *S. densiflorum*
- 8b. Inflorescence terminal and axillary; lateral nerves not close together *S. gardneri*

Syzygium aqueum (Burm.f.) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204. 1929; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 365. 2009. *Eugenia aquea* Burm.f., Fl. Ind. 114. 1768; Hook. f., Fl. Brit. India 2: 473. 1878.

Trees, to 6 m high, bark tawny-brown; branchlets first bluntly quadrangular, quickly terete. Leaves simple, opposite, 4.5-23 x 1.5-11 cm, elliptic-obovate, obovate or elliptic-oblong, apex obtuse, obtusely acuminate, acuminate or subretuse, base cuneate, subcordate or obtuse, margin entire, glabrous, coriaceous; petiole 1-5 mm long, stout, glabrous; lateral nerves 9-14 pairs, parallel, prominent, looped near the margin the margin forming intramarginal nerve, secondary laterals present, intercostae reticulate, gland-dotted. Flowers bisexual, pinkish-white, 10 in terminal or subterminal axillary cymes, subsessile. Calyx tube 1.5-3 cm long, funnel shaped; lobes 5, 6 mm long, ovate. Petals 5, 12 x 8 mm, oblong, obtuse, concave. Stamens many, inflexed in bud, 1.5 cm long; filaments brilliantly pink; anthers white. Ovary inferior, ovules many. Fruit a berry, 2 cm across, globose, pink-red.

Kariyenkappu, *KJD 22587*

Fl. & Fr.: December-June

Distribution: Cultivated in earlier settlements.

Syzygium caryophyllatum (L.) Alston in Trimen, Handb. Fl. Ceylon 6: (Suppl.) 116. 1931; Manilal & Sivar., Fl. Calicut 107. 1982; Ansari, Fl. Kasaragod Div. 158. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 181. 1988. *Myrtus caryophyllata* L., Sp. Pl. 472. 1753. *Syzygium caryophyllaeum*

sensu Gamble, Fl. Pres. Madras 480(339).1919, non Gaertn. 1788. *Eugenia caryophyllaea* Wight, Ic. t. 540. 1842; Hook. f., Fl. Brit. India 2: 490. 1878.

Trees, to 6 m high; bark thick, reddish-brown; branchlets terete. Leaves simple, opposite, 3-8 x 1.3-3.5 cm, obovate or obovate-oblong, apex obtuse, obtusely acute or emarginate, base attenuate or acute, margin entire, glabrous, coriaceous, brown on drying, pellucid-dotted; petiole upto 3 mm long, stout, glabrous; lateral nerves many, close, slender, prominent looped at the margin forming intramarginal nerve; intercostae reticulate. Flowers bisexual, white, 5 mm across, in terminal corymbose cymes, inflorescence branches moderately thick, ascending. Calyx tube 2-2.5 mm long, turbinate, no thick disc. Petals calyptrate. Stamens numerous, bent inwards at the middle when in bud, 2.5-3.5 mm long. Ovary inferior, 2-celled, ovules many; style 1; stigma simple. Fruit a berry, 5 mm across globose, black.

Ambalappara, KVB 31743

Fl. & Fr.: February-January

Distribution: Rare in Evergreen forests of Ambalappara and Kattikari.

Syzygium densiflorum Wall. ex Wight & Arn., Prodr. 329. 1834; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 359. 2009. *Syzygium arnottianum* (Wight) Walp., Rep. 2:180.1843. nom. superfl.; Gamble, Fl. Pres. Madras 475(338). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 357. 2009. *Eugenia arnottiana* Wight, Ill. Ind. Bot. 2: 17. 1841; Hook. f., Fl. Brit. India 2: 483. 1878. *Eugenia benthamiana* Wight ex Duthie in Hook. f., Fl. Brit. India 2: 484. 1878. *Eugenia arnottiana* (Walp.) Wight var. *benthamiana* Wight ex Duthie in Hook. f., Fl. Brit. India 2: 484. 1878. *Syzygium benthamianum* (Wight ex Duthie) Gamble, Fl. Pres. Madras 478(338). 1919.

Evergreen trees, to 20 m high; bark surface blackish-grey, rough; branchlets terete. Leaves simple, opposite, 3.5-9 x 1.8-3.7 cm, elliptic, elliptic-lanceolate or elliptic-oblong, apex acuminate or caudate acuminate, base attenuate or acute, margin entire, glabrous, glandular punctate, coriaceous, olive-green when dry; petiole 3-20 mm long, slender, grooved above, glabrous; lateral nerves many, parallel, close, prominent, looped at the margin forming intramarginal nerve, intercostae reticulate, prominent. Flowers bisexual, creamy, 10-12 mm long, sessile, in dense clusters forming compact, terminal trichotomous cymes. Calyx tube to 5 mm, turbinate; lobes 4; no thick disc. Petals free, deciduous. Stamens many free, bent inwards at the middle in bud. Ovary inferior, 2-celled, ovules many; style 1; stigma simple. Fruit a berry, oblong-ovoid, dark purple, fleshy.

Ambalappara, NS & KJD 31955; KVB 31742, 31590; NS & KVB 31363

Fl. & Fr.: February-June

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats. Conservation status: Vulnerable.

Syzygium gardneri Thw., Enum. Pl. Zeyl. 117. 1859; Gamble, Fl. Pres. Madras 479(339). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 359. 2009. *Eugenia gardneri* (Thw.) Bedd., For. Man. Bot. 108. 1874; Hook. f., Fl. Brit. India 2: 489. 1878. *Eugenia cymosa* Lam. var. *rostrata* Duthie in Hook. f., Fl. Brit. India 2: 482. 1878.

Evergreen trees, to 30 m high, bark 8-10 mm thick, surface yellowish-white, granulated, peeling off in small flakes; outer part of the inner bark fibrous, pale pink; branches slender, terete. Leaves simple, opposite, 5-10 x

2.5-5 cm, elliptic, elliptic-ovate or ovate-lanceolate, apex caudate-acuminate, base acute, margin entire, glabrous and glossy, membranous; petiole 10-15 mm long, slender, grooved above, glabrous, pellucid-dotted; lateral nerves many, slender, parallel, very close, prominent, looped near the margin forming distinct intramarginal nerve, intercostae reticulate, prominent. Flowers bisexual, 4-5 mm across, white, in axillary and terminal trichotomous cymes, branches slender, divaricate nearly at right angles; pedicels 2-5 mm long. Calyx tube 2 x 3 mm, turbinate, lobes 4, obtuse, obscure; disc obscure. Petals calyptrate. Stamens many, free, bent inwards at the middle when in bud; filaments 4 mm long. Ovary inferior, 2-celled, ovules many; style 1; stigma simple. Fruit a berry 5-8 mm across, ovoid, rarely globose, purple.

Way to Meenmutty, *KJD 26184*

Fl. & Fr.: March-June

Distribution: Fairly common in Evergreen forests of Meenmutty.

Syzygium hemisphericum (Wight) Alston in Trimen, *Handb. Fl. Ceylon 6* (Suppl.):115. 1931; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 360. 2009. *Eugenia hemispherica* Wight, *Ic. t.* 525. 1842; Hook. f., *Fl. Brit. India 2:* 477. 1878. *Jambosa hemispherica* (Wight) Walp., *Rep. 2:* 191. 1843; Gamble, *Fl. Pres. Madras 474*(335). 1919.

Trees, to 27 m high, bark surface dark-brown, smooth; branchlets terete. Leaves simple, opposite, 5.5-17.5 x 2-5 cm, elliptic, elliptic-lanceolate, elliptic-oblong or ovate-lanceolate, base cuneate or acute, apex acute, acuminate or caudate-acuminate, margin entire, coriaceous, glabrous, pellucid-dotted; petiole 10-20 mm, stout, grooved above, glabrous; lateral nerves 8-16 pairs, pinnate, slender, obscure, looped near the margin forming intramarginal nerve, intercostae reticulate, obscure. Flowers bisexual, 3-4 cm across, white or rose, densely packed; pedicel 5 mm long. Calyx tube 6 mm long, shortly and stoutly obconic, lobes 4, 3 x 6 mm, obtuse; disc thick. Petals 4, 7 mm across, free; stamens many, bent inwards in middle regularly when in bud; filaments 15 mm long. Ovary inferior, 2-celled, ovules many; style slender; stigma slightly acute. Fruit a berry, 23-25 mm across, globose, purple, crowned by calyx lobes.

Chavachi, *NS & KVB 31307*

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Chavachi.

Syzygium laetum (Buch.-Ham.) Gandhi in Saldanha & Nicolson, *Fl. Hassan Dist.* 282. 1976; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 182. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 361. 2009. *Eugenia laeta* Buch.-Ham., *Mem. Wern., Nat. Hist. Soc.* 5: 338. 1826; Hook. f., *Fl. Brit. India 2:* 479. 1878. *Jambosa laeta* (Buch.-Ham) Blume, *Mus. Bot. Lugd.-Bat.* 1:104.1849; Gamble, *Fl. Pres. Madras 474*(335). 1919. *Eugenia pauciflora* Wight, *Ic. t.* 526. 1842. *Jambosa pauciflora* (Wight) Wight, *Illustr. 2:* 14. 1850.

Trees, to 10 m high, bark greyish-white, smooth; branchlets slender, terete. Leaves simple, opposite, 6-15 x 2-6 cm, elliptic, ovate, elliptic-ovate, elliptic-oblong or elliptic-lanceolate, apex acuminate or obtusely acuminate, base cuneate, attenuate or acute, margin entire, glabrous, chartaceous, pellucid-punctate;estipulate; petiole 5-10 mm long, stout, grooved above, glabrous; lateral nerves 10-15 pairs, parallel, slender, forming intramarginal nerve near the margin (not at the margin), intercostae reticulate, slender, faint. Flowers bisexual, 4-5 cm across, crimson or lemon yellow, solitary or 2-5 together in axillary or terminal cymes; pedicel 2-5 cm long. Calyx tube 1.5-2

cm long, slenderly funnel shaped below, suddenly broadening above; lobes 4, 8 x 8 mm, orbicular, persistent; disc thick. Petals 4, 10 x 10 mm, orbicular, punctuate. Stamens numerous, 2-3 cm long, yellow or pink, bent inwards in the middle regularly in bud. Ovary inferior, 2-celled, ovules many; style longer than the stamens; stigma slightly acute. Fruit a berry 2-2.5 x 1.5 cm, oblong, crowned by calyx lobes.

Moonamthode, KVB 31619

Fl. & Fr.: November-July

Distribution: Common in Evergreen forests of Moonamthode, Kattikari, Chavachi and Meenmutty. Endemic to southern Western Ghats.

Syzygium lanceolatum (Lam.) Wight & Arn., Prodr. 330. 1834; Ansari, Fl. Kasaragod Div. 159. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 361. 2009. *Eugenia lanceolata* Lam., Encycl. 3: 200. 1789. *Syzygium wightianum* Wall. ex Wight & Arn., Prodr. 330. 1834; Gamble, Fl. Pres. Madras 478(338). 1919. *Eugenia wightiana* (Wall. ex Wight & Arn.) Wight, Ic. t. 529. 1842; Hook. f., Fl. Brit. India 2: 485. 1878. *Syzygium claviflorum* sensu Shareef et al., Rheedeia 20: 52. 2010, non (Roxb.) Wall. ex A.M. Cowan & Cowan, 1929.

Trees, to 12 m high, bark greyish-brown, smooth; branchlets terete. Leaves simple, opposite, 7.5-12.5 x 2-3.7 cm, elliptic, elliptic-oblong, or elliptic-lanceolate, apex obliquely acuminate or acute, base cuneate or acute, margin entire, glabrous, chartaceous, pellucid-dotted; petiole 4-6 mm long, slender, grooved above, glabrous; lateral nerves many, parallel, slender, not always close, obscure, looped at the margin forming intramarginal nerve, intercostae reticulate, obscure. Flowers bisexual, white, 5 mm across, in axillary and terminal cymes; pedicel to 2 mm. Calyx tube 12 x 3 mm, elongate, funnel shaped, lobes 4, short; disc obscure. Petal 4, often many, 3 x 3 mm, suborbicular. Stamens many, bent inwards at the middle in bud, 6 mm long. Ovary inferior, 2-celled; ovules many; style 1; stigma simple. Fruit a berry 10-12 mm long, ovoid-turbinate, bright scarlet.

Ambalappara, NS & KJD, 31941; KVB 31643

Fl. & Fr.: December-April

Distribution: Common in Evergreen forests of Ambalappara, Asthipara and Pothurumi.

Syzygium munronii (Wight) Chandrab., Biol. Mem. 2:58. 1977; Ramach. & V.J. Nair, Fl. Cannanore Dist. 182. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 362. 2009. *Eugenia munronii* Wight, Ic. t. 546. 1842; Hook. f., Fl. Brit. India 2: 472. 1878. *Jambosa munronii* (Wight) Walp., Rep. 2: 191. 1843; Gamble, Fl. Pres. Madras 473(335). 1919.

Large shrubs or small trees; branchlets quadrangular. Leaves simple, opposite, 22 x 7 cm, lanceolate, subsessile, glabrous; nerves and intramarginal veins prominent. Cymes 5-10 cm broad, terminal. Flowers few, 4 cm across; pedicels 1 cm long. Calyx 2.5 cm long, funnel-shaped; lobes 1 x 1 cm, orbicular. Petals orbicular, 15 x 15 mm, yellowish white; filaments 2.5 cm long, white. Berry 25 x 15 mm, ellipsoid, glabrous.

Pothurumi, KVB 31666

Fl. & Fr.: December-May

Distribution: Common in Evergreen forests of Kattikari, Chavachi and Pothurumi. Endemic to Western Ghats.

Syzygium salicifolium (Wight) Graham, Cat. Pl. Bombay 73. 1839; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 363. 2009. *Eugenia salicifolia* Wight, Ill. Ind. Bot. 2: 16. 1841. *Eugenia heyneana* Duthie in Hook. f., Fl. Brit. India 2: 500.

1879. *Syzygium heyneanum* (Duthie) Wall. ex Gamble, Fl. Pres. Madras 482(341). 1919; Ansari, Fl. Kasaragod Div. 158. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 181. 1988.

Trees, to 6 m high; branchlets obscurely quadrangular. Leaves simple, opposite, 6-10 x 1.3-3 cm, oblong or elliptic, apex obtuse or retuse, base acute, margin entire, coriaceous, glabrous, pale beneath, glandular punctate; petiole 4-5 mm long, slender, grooved above, glabrous; lateral nerves many parallel, close, but slightly irregular, very slender, slightly prominent on both sides, looped at the margin forming intramarginal nerve, intercostae reticulate, slender prominent as lateral nerves. Flowers bisexual bisexual, small, sessile, white, in lateral, terminal or rarely axillary cymes. Calyx tube 2 x 3.5 mm, turbinate, disc obscure. Petals calyptrate, 3 mm across. Stamens many, free, bent inwards at the middle when in bud; filaments 3 mm long. Ovary 2-celled; ovules many; style 1; stigma simple. Fruit a berry, obovoid, 1-1.5 x 0.5-0.7 cm, crowned with the cup-like calyx limb.

Valayamchal, *KJD 22570*

Fl. & Fr.: April-May

Distribution: Common along the river side in Semi-evergreen forests of Valayamchal and Pookundu. Endemic to India

LECYTHIDACEAE

CAREYA Roxb. Pl. Coromandel 3: 13. 1811, *nom. cons.*

Careya arborea Roxb., Pl. Corom. t. 218. 1811; Hook. f., Fl. Brit. India 2: 511. 1879; Gamble, Fl. Pres. Madras 488(345). 1919; Manilal & Sivar., Fl. Calicut 108. 1982; Ansari, Fl. Kasaragod Div. 160. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 184. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 365. 2009.

Deciduous trees, to 12 m high, bark 10-12 mm thick, brownish, rough, exfoliations small, more or less triangular; fibrous; branchlets pubescent. Leaves simple, alternate, clustered at the tips of branchlets, 15-30 x 5-15 cm, obovate, oblong-obovate, apex round or shortly acuminate, base cuneate or attenuate and decurrent on petiole, margin crenate-serrate, glabrous, membranous; petiole 10 mm long, slender, pubescent; lateral nerves 10-12 pairs, parallel, prominent, intercostae reticulate, prominent. Flowers bisexual, greenish-white,, 5-10 mm across, in terminal spikes; peduncle woody; bracts 3, unequal. Calyx tube campanulate, glabrous, adnate to ovary and not produced beyond the ovary; lobes 4, ovate, imbricate. Petals 4, elliptic-oblong, revolute along margin, cauducous; disc annular. Stamens numerous in several rows, slightly connate at base, inserted on the top of calyx; filaments subulate, purple, exserted, inner and outer rows without anthers. Ovary inferior, 4-5-celled, ovules many in each cell; style long, filiform; stigma capitate. Fruit a berry, 5-7.5 cm across, globose, green, pericarp fibrous, crowned with sepals and style.

Paripode, *KJD 18760*

Fl. & Fr.: February-July

Distribution: Rare in Deciduous forests of Paripode.

MELASTOMATACEAE

- 1a. Leaves 3-9-ribbed from the base..... 2
- 1b. Leaves penninerved..... Memecylon
- 2a. Flowers 3-merous Sonerila
- 2b. Flowers 4 or 5-merous 3
- 3a. Epiphytic shrubs; leaves thick..... Medinilla
- 3b. Terrestrial plants; leaves not thick..... 4
- 4a. Stamens similar Osbeckia
- 4b. Stamens dimorphic..... Melastoma

MEDINILLA Gaud., in Freyc., Voy. Uranie Bot. 484. 1830.

Medinilla beddomei Clarke in Hook. f., Fl. Brit. India 2: 548. 1879; Gamble, Fl. Pres. Madras 496(351). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 185. 1988; Sasidh. & Sujanapal, Rheedeia 15: 105. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 366. 2009. *Medinilla radicans* sensu Bedd., Ic. t. 184. 1868-1874, non Blume 1831.

Epiphytic shrubs; branches terete, pendulous. Leaves simple, opposite, 2.5 cm across, obtuse at base and apex, very succulent, ribs indistinct; petiole 5 mm long. Cymes axillary, 1-3 flowered; pedicels 2 cm long, glabrous. Flowers white. Calyx tube 7 mm long, wavy along the rim. Petals white, 1.5 x 1.2 cm, obovate, spreading. Stamens 10, anthers 8 mm long, acuminate, spur at the base of the anther, 1.5 mm long, curved up.

Ambalappara, KJD 25594

Fl. & Fr.: May-June

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

MELASTOMA L., Sp.Pl. 389. 1753.

Melastoma malabathricum L., Sp. Pl. 390. 1753; Hook. f., Fl. Brit. India 2: 523. 1879; Gamble, Fl. Pres. Madras 495(350). 1919; Manilal & Sivar., Fl. Calicut 110. 1982; Ansari, Fl. Kasaragod Div. 161. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 185. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 367. 2009.

Shrubs to 1.3 m tall; stem densely covered with paleaceous pectinate hairs. Leaves simple, opposite, 4-11 x 1.5-4 cm, elliptic-oblong, apex acute, base attenuate, upper surface prominently lineolate, lower surface tomentose, 5-ribbed, drying dull-greenish; petiole to 1.5 cm long. Flowers solitary or few in rather dense clusters, c. 5 cm across; bracts 1.2-2 x 1-1.4 cm, boat-shaped, densely paleaceous hairy. Calyx tube 0.7-1 cm long, campanulate; lobes 5, 5-7 x 4-5 mm, ovate-lanceolate, densely paleaceous hairy. Petals 5, reddish purple, 1.5-2 x 0.7-1 cm, obovate. Stamens 10, alternating ones large and small; anthers dimorphic, dehiscence by apical pores. Ovary ovoid, 5-locular; ovules many; style simple. Capsules 1-1.5 x 0.8-1 cm, ovoid, irregularly dehiscent; seeds many, minute.

Paripode, NS & KJD 25570

Fl. & Fr.: Throughout the year

Distribution: Along the boundaries near Farm.

MEMECYLON L., Sp. Pl. 349. 1753.

- 1a. Leaves rounded or cordate at base *M. randerianum*
1b. Leaves acute at base 2
2a. Flowers sessile *M. lawsonii*
2b. Flowers pedicelled *M. wightianum*

Memecylon lawsonii Gamble, Bull. Misc. Inform. Kew 1919: 226. 1919 & Gamble, Fl. Pres. Madras 503(355). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 186. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 369. 2009.

Shrubs; branches few, terete. Leaves simple, opposite, 18 x 3.5 cm, lanceolate, acuminate; nerves 10-12 pairs, pale; petiole 1 cm long. Flowers 1-3, axillary. Calyx 1 mm long, lobes ovate, acute, pale pink. Petals 2.5 mm long, obovate-oblong, keeled, blue. Stamens 8, anthers 1 mm long, curved at base. Berry 8 x 9 mm; yellow, sessile.

Ambalappara, KVB 31739

Fl. & Fr.: September-March

Distribution: Common Semi-evergreen forests of Chullikandam, Narikkadavu and Paripode, Evergreen forests of Meenmutty and Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Memecylon randerianum SM & MR Almeida, Journ. Bombay Nat. Hist. Soc. 85: 521. 1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 370. 2009. *Memecylon malabaricum* (Clarke) Cogn. in A. & C. DC., Monogr. Phan. 7: 1148. 1891; Gamble, Fl. Pres. Madras 505(356). 1919; Manilal & Sivar., Fl. Calicut 111. 1982. *Memecylon amplexicaule* Roxb. var. *malabarica* Clarke in Hook. f., Fl. Brit. India 2: 559. 1879 p.p.

Bushy shrubs. Leaves simple, opposite, 5-12 x 1.5-4 cm, ovate, apex gradually acute, cordate at base, sessile; nerves obscure. Flowers fascicled in very dense many-flowered cymes; peduncles 1-2 mm long; pedicels short, 1-2 mm long. Calyx tube 1-2 mm long, campanulate, truncate at apex. Petals 1-2 mm long, obovate, blue. Style subulate, c. 3 mm long. Berry 4-5 mm across, globose.

Asthipara, *KVB 31627*; Kattikari, *KJD 26052*

Fl. & Fr.: February-June

Distribution: Common in Evergreen forests of Asthipara, Pothurumi, Chavachi, Kattikari, Meenmutty and Kurumbankallu. Endemic to southern Western Ghats.

Memecylon wightii Thw., Enum. Pl. Zeyl. 113. 1859; Clarke in Hook. f., Fl. Brit. India 2: 554. 1879. *Memecylon wightii* Thw. var. *cylindricum* Trimen, Handb. Fl. Ceylon 2: 213. 1894.

Shrubs or small trees; branchlets winged to acutely quadrangular or occasionally terete. Leaves opposite, 4-8 x 1.5-3.5 cm, elliptic-ovate, basally cordate and semiamplexicaul, subacute or shortly caudate and obtuse at the very apex, often with slightly revolute margins, with indistinct intramarginal and lateral veins, coriaceous, more or less shining above; foliar sclereids filiform; sessile or with a very short petiole. Inflorescence condensed; flowers many, congested in tufts at the nodes on the branches below the leaves. Pedicels 2-3 times the calyx length. Buds with exposed petals. Calyx 2.3-3 mm wide, smooth or shallowly striate inside, shallowly 4-lobed. Petals blue. Anthers 1.2-1.9 mm long; connective with a gland. Fruits globose.

Ambalappara, *NS & KJD 31946*; *KVB 31740*; *KVB 31635*; *NS & KVB 31360*

Fl. & Fr.: February-May

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Western Ghats.

OSBECKIA L., Sp. Pl. 345. 1753.

- 1a. Flowers less than 1.5 cm across *O. muralis*
1b. Flowers more than 2 cm across 2
2a. Flowers solitary, herbs *O. aspera*
2b. Flowers terminal cymes, shrubs *O. gracilis*

Osbeckia aspera (L.) Blume, Bijdr. Natuurk. Wetensch. 6: 220. 1831, **var. aspera**; Hook. f., Fl. Brit. India 2: 519. 1879, p.p'; Gamble, Fl. Pres. Madras 492(347). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 372. 2009. *Melastoma asperum* L., Sp. Pl. 389. 1753. *Osbeckia kleinii* Wight & Arn., Prodr. 323. 1834; Gamble, Fl. Pres. Madras 492(348). 1919. *Osbeckia courtallensis* Gamble, Bull. Misc. Inform. Kew 1918: 242. 1918 & Gamble, Fl. Pres. Madras 492(348). 1919.

Osbeckia kewensis C.E.C. Fisch., Bull. Misc. Inform. Kew 1938: 34. 1938. *Osbeckia lawsonii* Gamble, Bull. Misc. Inform. Kew 1918: 242. 1918 & Gamble, Fl. Pres. Madras 503(348). 1919

Erect shrubs; branchlets more or less pubescent with appressed to spreading hairs. Leaves simple, opposite, 3.5-9 x 1.5-3.2 cm, elliptic-lanceolate, acute to shortly acuminate at apex, base attenuate, basally 5-ribbed, more or less pubescent with appressed short hairs on both sides, drying yellowish-green; petiole to 1 cm long. Flowers ca 2 cm across, in terminal cymes, sometimes elongated clusters, pentamerous. Calyx tube 6-8 mm long, ca 5 mm wide, cupular, with dense short bristle-like hairs; lobes 5, oblong, obtuse. Petals 5, pink, 1-1.5 x 0.8-1 cm, ovate, apex rounded. Stamens 10; anthers 5-6 mm long. Ovary hairy at apex; style exerted, 1.25-1.5 cm long; stigma curved, papillate. Capsules 0.8-1 x 0.6-0.7 cm, ovoid, ribbed; seeds many.

Ambalappara, *KJD 31774*

Fl. & Fr.: August-April

Distribution: Fairly common in Grasslands and Evergreen forests of Ambalappara.

Osbeckia gracilis Bedd., Madras J. Lit. Sci. ser. 3, 1: 45. 1864; Hook. f., Fl. Brit. India 2: 518. 1879; Gamble, Fl. Pres. Madras 494(349). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 373. 2009. *Osbeckia sublaevis* Cogn. in A. & C. DC., Monogr. Phan. 7:321.1891; Gamble, Fl. Pres. Madras 492(348). 1919. *Osbeckia lineolata* Gamble, Bull. Misc. Inform. Kew 1918: 241. 1918 & Gamble, Fl. Pres. Madras 492(347). 1919.

Osbeckia lineolata Gamble var. *anamalayana* Giri & M.P. Nayar, Bull. Bot. Surv. India 25: 244. 1983.

Stout shrubs; branches glaucous, glabrous. Leaves to 3.5 x 2 cm, elliptic-oblong, obtuse at apex and base, cuspidate, yellowish green, densely covered with half-adnated hairs spreading from midrib, 3-ribbed; petiole 3 mm long. Flowers in terminal cymes, pedicelled; calyx tube 7 mm long, densely stellate hairy, lobes 4 x 3 mm, ovate-oblong, obtuse, ciliate; petals 15 x 12 mm, obovate, ciliate, pink; anthers 5 mm long.

Ambalappara, *NS & KJD 31977; KVB 31707*

Fl. & Fr.: August-September

Distribution: Evergreen forests of Ambalappara.

Osbeckia muralis Naud., Ann. Sci. Nat. Bot. ser.3, 14: 456. 1850; Ansari, Fl. Kasaragod Div. 165. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 187. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 373. 2009. *Osbeckia truncata* D. Don ex Wight & Arn., Prodr. 322. 1834, p.p.; Hook. f., Fl. Brit. India 2: 514. 1879; Gamble, Fl. Pres. Madras 494(349). 1919. *Osbeckia truncata* var. *kurzii* Clarke in Hook.f., Fl. Brit. India 2: 514. 1879.

Erect herbs; stem 4-angled, laxly villous. Leaves simple, opposite, 1-3.5x 0.8-2 cm, elliptic to oblong, apex acute, base rounded to obtuse, chartaceous, densely pubescent with long hairs on both sides, 3-ribbed; petiole to 6 mm long. Flowers few in terminal cymose clusters, 4-merous, c. 1.5 cm across. Calyx tube 2-4 mm wide, cupular, ribbed, long-simple hairy; lobes 4, 2-4 mm long, triangular, stellately bristly at apex. Petals pink, 4-6 x 3-4 mm, ovate. Stamens 8; anthers 2-4 mm long, ovate-oblong, apex truncate. Ovary 4-locular, apically with many erect bristles. Capsule 4-6 mm long, globose; seeds many, minute.

Paripode, *KJD 22588*

Fl. & Fr.: September-January

Distribution: Fairly common along the boundaries of Semi-evergreen forests of Paripode. Endemic to Western Ghats.

SONERILA Roxb., Fl. Indica 1: 180. 1820, *nom. cons.*

- 1a. Plants scapigerous 2
1b. Plants cauline 3
2a. Leaves orbicular; peduncle red *S. rotundifolia*
2b. Leaves ovate; peduncle green..... *S. wallichii*
3a. Stem more than 10 cm long, woody *S. versicolor*
3b. Stem below 10 cm, Slender *S. rheedei*

Sonerila rheedei Wight & Arn., Prodr. 321. 1834, 'rheedii'; Gamble, Fl. Pres. Madras 500(353). 1919; Manilal & Sivar., Fl. Calicut 109. 1982; Ansari, Fl. Kasaragod Div. 166. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 189. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 375. 2009. *Sonerila wallichii* sensu Clarke in Hook. f., Fl. Brit. India 2: 538. 1879 p.p., non Bennett 1844.

Stem to 15 cm high, quadrangular, hispid. Leaves to 12 x 6 cm, ovate, penninerved, acute at apex; rounded or cordate at base, hirtus, green; nerves 4 pairs; petiole 4 cm long, hispid. Peduncle terminal or upper axillary, 8-12-flowered. Flowers 1 cm across; pedicel 8 mm long; sepals triangular, glandular hairy; petals 4 x 3 mm, elliptic, with a hairy midrib; pink; anthers 3 mm long, acute. Capsule 4 x 3 mm, glandular hairy; seeds obovoid, brown, glandular.

Chelachode, NS & KJD 31937

Fl. & Fr.: July-November

Distribution: Common in Evergreen forests of Chelachode, Pothanplavu and Chavachi. Endemic to southern Western Ghats.

Sonerila rotundifolia Bedd., Madras J. Lit. Sci. ser. 3, 1: 74. 1861 & Ic. t. 169. 1868-1874; Hook. f., Fl. Brit. India 2: 538. 1879; Gamble, Fl. Pres. Madras 500(353). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 375. 2009.

Stemless herbs. Leaves few, simple, radical, 6.5-8 cm across, orbicular, deeply cordate at base, crenate, 9-ribbed from base, pilose along the nerves, reddish brown, petiole to 12 cm long. Peduncle to 15 cm long, 8-10 flowered. Flowers 2.5 cm across, confined to the apex of the scape in scorpioidal cyme; pedicel 1 cm long, pink. Sepals 1.5 x 3 mm, triangular. Petals 12 x 9 mm, obovate, pink. Anthers 6 mm long, acuminate, deeply cleft at base; filaments 7 mm long. Style 11 mm long.

Ambalappara, KJD 25429

Fl. & Fr.: July-October

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Sonerila versicolor Wight, Ic. t. 1057. 1846; Hook. f., Fl. Brit. India 2: 535. 1879, pro parte; Gamble, Fl. Pres. Madras 499(352). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 190. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 376. 2009.

Erect woody undershrubs, whole plant violetish. Leaves simple, opposite, 3-10 x 1-2.5 cm, ovate lanceolate, long acuminate at apex, broadly attenuate at base, oblique, serrate on margins with mucronate tip for serrations, penninerved. Petioles 1-2.5 cm long. Cymes terminal. Peduncles 1.5-4 cm, sparsely glandular hairy. Pedicels 0.2-0.4 cm long. Calyx tube 3-angled, 0.4-0.5 cm, glandular hairy; lobes broadly triangular, glandular hairy. Petals 0.5-0.6 cm long, 0.3 cm wide, ovate-lanceolate. Anthers 0.4 cm, attenuate. Style

0.5-0.6 cm long; stigma capitate. Capsules turbinate, 1-1.2 x 0.4-0.5 cm, 6-ribbed; seeds elongate, tubercled; raphae forming a capitate appendage.

Ambalappara, *KJD 22589*

Fl. & Fr.: June-January

Distribution: Fairly common in Evergreen forests of Ambalappara, Asthipara, Mullenpara and Pothurumi. Endemic to southern Western Ghats.

Sonerila wallichii Bennett, Pl. Jav. Rar. 215. 1844; Hook. f., Fl. Brit. India 2: 538. 1879, p.p.; Gamble, Fl. Pres. Madras 500(353). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 190. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 377. 2009.

Scapigerous herbs, leaves one or very few; 5 x 3 cm, ovate, acute, cordate at base, serrulate, crispate hairy above, 3 pairs of nerves from the base; petiole 1-3 cm long. Peduncles to 9 cm long, glandular hairy; 4-6 flowered. Flowers 10 mm across; pedicels 5 mm long. Sepals triangular, hairy. Petals 5 x 4 mm, elliptic, acute, pink. Anther 2 mm long, acute. Style 5 mm long, glabrous. Capsule 2.5 x 2.5 mm, hemispheric, glandular hairy.

Chelachode, *NS & KJD 31937*

Fl. & Fr.: July-November

Distribution: Common in Evergreen forests of Chelachode, Pothanplavu and Chavachi. Endemic to southern Western Ghats.

LYTHRACEAE

- 1a. Herbs with small flowers, calyx membranous 2
- 1b. Shrubs or trees, calyx not membranous 3
- 2a. Fruit dehiscent, opening in valves *Rotala*
- 2b. Fruit indehiscent, opening irregularly *Ammannia*
- 3a. Flowers zygomorphic, calyx tubular, curved *Woodfordia*
- 3b. Flowers actinomorphic, calyx not tubular, straight *Lagerstroemia*

AMMANNIA L., Sp. Pl. 119. 1753.

Ammannia baccifera L., Sp. Pl. (ed.2) 175. 1762; Koehne in Engl., Bot. Jahrb. Syst. 1: 260. 1880; Hook. f., Fl. Brit. India 2: 569. 1879; Gamble, Fl. Pres. Madras 510(360). 1919; Manilal & Sivar., Fl. Calicut 111. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 191. 1988; Joseph, Aquatic Angiosp. Malabar 101. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 377. 2009. *Ammannia vesicatoria* Roxb., Fl. Ind. 1: 426. 1832.

Erect annual herbs to 40 cm tall; stem 4-angled or more or less winged. Leaves simple, decussate, sessile, 2-6 x 0.5-0.8 cm, linear to elliptic, apex acute, base attenuate, chartaceous. Cymes dischiasial, axillary. Flowers 4 or 5-merous, perigynous; pedicels c. 2 mm long. Calyx tube 1-2 mm long, campanulate; lobes 4, 1-1.5 mm long, triangular. Petals absent. Stamens 4; filaments c. 0.5 mm long. Ovary 1 mm in diam., globose, 4-5-locular; ovules many; stigma capitate. Capsule 1.5-2 mm across, globose, exceeding calyx tube; seeds brownish, concavo-convex.

Chullikandam, *KJD 22590*

Fl. & Fr.: September-December

Distribution: Rare along stream side.

LAGERSTROEMIA L., Syst. Nat. ed. 10, 2: 1068.1759.

- 1a. Flowers 5 cm across, calyx tube ribbed *L. speciosa*
- 1b. Flowers 8 mm across, calyx tube smooth *L. microcarpa*

Lagerstroemia microcarpa Wight, Ic. t. 109. 1839; Ramach. & V.J. Nair, Fl. Cannanore Dist. 192. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 378. 2009. *Lagerstroemia lanceolata* Wall. ex Clarke in Hook. f., Fl. Brit. India 2: 576. 1879; Gamble, Fl. Pres. Madras 513(362). 1919. *Lagerstroemia thomsonii* Koehne in Engl., Pflanzenreich Lythrac. 257. 1903; Gamble, Fl. Pres. Madras 513(362). 1919.

Deciduous trees, to 30 m high, bark 6-8 mm thick, greyish or greyish-white, smooth, peeling off in thin long and broad flakes; outer parts brittle, inner layers fibrous; branches knotted. Leaves simple, opposite, distichous, 4.5-10 x 3.7-6.5 cm, elliptic, ovate, elliptic-lanceolate or ovate-lanceolate, apex acute or acuminate, base attenuate or acute, margin entire, glabrous and shining above, velvety pubescent beneath, chartaceous; stipules 2, intrapetiolar, deciduous; petiole 6-15 mm long, slender, glabrous; lateral nerves 6-10 pairs, pinnate, prominent, intercostae scalariform, faint. Flowers bisexual, 5-6 mm across, white, in axillary and terminal panicles. Calyx smooth, hoary, without a ring; lobes 6, triangular, persistent, reflexed. Petals 6, 3 mm long, obovate, white, clawed. Stamens numerous, inserted at the base of calyx tube; filaments long, exerted. Ovary half inferior, sessile, glabrous, 4-6-celled, ovules many; style long, curved; stigma capitate. Fruit a capsule, 8-12 mm long, ovoid, 4-6 valved, dehiscent; seeds many, elongate, falcately winged, brownish.

Kariyenkappu, NS & KVB 31367

Fl. & Fr.: June-February

Distribution: Rare in Plantations of Kariyenkappu. Endemic to Western Ghats.

Lagerstroemia speciosa (L.) Pers., Syn. 2:72.1806; Manilal & Sivar., Fl. Calicut 114. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 192. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 379. 2009. *Lagerstroemia reginae* Roxb., Pl. Corom. t. 65. 1796; Ansari, Fl. Kasaragod Div. 166. 1985; Vajr., Fl. Palghat Dist. 205. 1990. *Lagerstroemia flos-reginae* Retz., Obs. Bot. 5: 25.1788; Hook. f., Fl. Brit. India 2:577.1879; Gamble, Fl. Pres. Madras 513(362). 1919. *Lagerstroemia hirsuta* (Lam.) Willd., Sp. Pl. 2: 1178. 1799; Anil Kumar et al., Fl. Pathanamthitta 227. 2005. *Adambea hirsuta* Lam., Encycl. 1: 39. 1783.

Deciduous trees, to 25 m high, bark 4-6 mm thick, yellowish-brown, smooth; fibrous. Leaves simple, opposite or subopposite, 7.5-25 x 3-10 cm, oblong, ovate-lanceolate, elliptic-lanceolate or elliptic-oblong, apex acute, base obtuse, round or acute, margin entire, glabrous, coriaceous; stipules intrapetiolar, deciduous; petiole 6-12 mm long, stout, glabrous; lateral nerves 11-19 pairs, parallel, prominent beneath, intercostae reticulate, prominent. Flowers bisexual, 5-7 cm across, mauve or pink, in terminal panicles; inflorescence branches puberulous; pedicel 1 cm long. Calyx tube 1 x 1.3 cm, hemispherical, puberulous, ribbed without; lobes 6, triangular, acute. Petals 6, 4 x 2.5 cm, obovate, clawed, margins crispate. Stamens many, inserted near the base of the calyx tube; filaments exerted. Ovary half inferior, sessile, glabrous, 6-celled, ovules many; style 2 cm long, curved; stigma capitate. Fruit a capsule, 18-30 mm long, ovoid, brown, woody, dehiscent; seeds 10-12 mm long, winged, pale brown.

Poathanplavu, NS & KVB 31321

Fl. & Fr.: March-November

Distribution: Common in Semi-evergreen forests of Pothanplavu and Narikkadavu; Evergreen forests of Chavachi.

ROTALA L., Mant. 143, 175. 1771.

- 1a. Bracts cordate; capsule 4-valved *R. rotundifolia*
1b. Bracts acute at base, falcately folded; capsule 2-valved *R. indica*

Rotala indica (Willd.) Koehne in Engl., Bot. Jahrb. Syst. 1: 172. 1880; Gamble, Fl. Pres. Madras 508(359). 1919; Manilal & Sivar., Fl. Calicut 112. 1982; Joseph, Aquatic Angiosp. Malabar 112.1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 381. 2009. *Peplis indica* Willd., Sp. Pl. 2: 244. 1799. *Ammannia peploides* Spreng., Syst. Veg. 1: 444. 1825; Hook. f., Fl. Brit. India 2: 566. 1879.

Amphibious annuals; stem erect or decumbent to 35 cm long, 4-angled or terete, rooting at the nodes. Leaves simple, decussate, sessile or subsessile, 0.5-1.6 x 0.4-1 cm, obovate-spathulate or suborbicular, apex acute, obtuse or emarginate, base cuneate or obtuse, margins cartilaginous; bracts dimorphic, leaf like on major branches, much smaller elliptic-oblong on flowering branches which ultimately look like bracteate spikes; bracteoles 2, 1.5-2 mm long, linear to lanceolate. Flowers sessile, axillary, solitary. Calyx tube pink or red, turning brown, 1.5-2.5 mm long, campanulate; lobes 4, 1 mm long, triangular, appendages absent. Petals 4, pink, 0.5 mm long, elliptic. Stamens 4 or some times fewer, filaments inserted at about the middle of calyx tube. Ovary 1 mm long, ellipsoidal; style to 1 mm long; stigma capitate. Capsule 2 mm long, ellipsoid, 2-valved; seeds hemispherical.

Ambalappara, KJD 26327

Fl. & Fr.: July-February

Distribution: Fairly common near water bodies in Evergreen forests of Ambalappara.

Rotala rotundifolia (Buch.-Ham. ex Roxb.) Koehne in Engl., Bot. Jahrb. Syst. 1: 175. 1880; Gamble, Fl. Pres. Madras 509(359). 1919; Manilal & Sivar., Fl. Calicut 113. 1982; Ansari, Fl. Kasaragod Div. 168. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 194. 1988; Joseph, Aquatic Angiosp. Malabar 124. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 383. 2009. *Ammannia rotundifolia* Buch.-Ham. ex Roxb., Fl. Ind. 1: 446. 1820; Hook. f., Fl. Brit. India 2: 566. 1879.

Erect herbs, to 15 cm high; stem reddish, 4-angled. Leaves simple, opposite, 8 x 6 mm, oblong-orbicular, sessile, glabrous, 5-nerved. Racemes 1-1.5 cm long, bracteoles 2 mm long, lanceolate. Calyx tube 2.5 mm long, lobes triangular, acute; intersepal appendages absent. Petals 1.5 x 1 mm, obovate. Staminal filaments attached near the base of calyx tube. Ovary 1 x 1 mm, obovoid, truncate, obtuse, 4-angled; style 1 mm long.

Ambalappara KJD 26337, NS & KVB 31305

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Ambalappara.

WOODFORDIA Salisb., Parad. Lond. t. 42. 1806.

Woodfordia fruticosa (L.) Kurz, J. Asiat. Soc. 40: 56. 1871; Gamble, Fl. Pres. Madras 511(361). 919; Manilal & Sivar., Fl. Calicut 115. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 383. 2009. *Lythrum fruticosum* L., Syst. (ed. 10) 1045. 1759. *Woodfordia floribunda* Salisb., Parad. Lond. t. 42. 1806; Hook. f., Fl. Brit. India 2: 572. 1879.

Deciduous shrubs to 3 m tall with spreading stems. Leaves simple, opposite, subsessile, 4-11 x 2-4 cm, ovate-lanceolate or lanceolate, subcoriaceous, whitish velvety tomentose and finely orangish-or black-punctate beneath. Flowers crimson, slightly zygomorphic, in 2-16-flowered axillary cymes; pedicels to 1 cm long. Calyx tube 1-1.5 cm long, tubular; lobes 6, short, more or less triangular, alternating with small callous appendages. Petals 6, red, 3-4 mm long, lanceolate-acuminate. Stamens 12, inserted near the bottom of the calyx tube, 0.5-1.5 cm long. Ovary 4-6 mm long, oblong, 2-celled; ovules many; style 0.7-1.5 cm long. Capsule 0.6-1 x 0.25-0.4 cm, ellipsoid, included in the calyx; seeds numerous, trigonous-ovoid.

Paripode, *KJD 22551*

Fl. & Fr.: January-April

Distribution: Cultivated and rarely seen along the boundaries at Paripode.

ONAGRACEAE

LUDWIGIA L., Sp. Pl. 118. 1753.

Ludwigia hyssopifolia (G. Don) Exell, Garcia de Orta 5: 471. 1957; Ansari, Fl. Kasaragod Div. 170. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 195. 1988; Joseph, Aquatic Angiosp. Malabar 161.1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 384. 2009. *Jussiaea hyssopifolia* G. Don, Gen. Hist. 2: 693. 1832. *Jussiaea linifolia* Vahl, Ecolg. Amer. 2: 32. 1798, non *Ludwigia linifolia* Poir., 1813; Gamble, Fl. Pres. Madras 1875(1298). 1936. *Fissendocarpa linifolia* (Vahl) Bennet, Journ. Bombay Nat. Hist. Soc. 67: 126. 1970; Manilal & Sivar., Fl. Calicut 116. 1982.

Herbs; branchlets angled or winged. Leaves simple, 2.5-5 x 1-2 cm, elliptic-lanceolate, apex gradually acute to acuminate, base cuneate, glabrous, membranous; petiole to 1 cm long. Flowers solitary, axillary. Calyx tube narrow; lobes 4, c. 3 mm long, lanceolate, persistent. Petals 4, obovate, yellow. Stamens 8; filaments unequal. Ovary 4-celled; ovules many; stigma 4-lobed. Capsule c. 2 cm long, linear, terete, 8-ribbed; seeds dimorphic, uniseriate and embedded in endocarp below and pluriseriate and free above.

Narikkadavu, *KJD 25587*

Fl. & Fr.: August-December

Distribution: Common along river sides.

PASSIFLORACEAE

- 1a. Flowers unisexual Passiflora
1b. Flowers bisexuals..... Adenia

ADENIA Forssk., Fl. Aegypt.-Arab. 77. 1775.

Adenia hondala (Gaertn.) de Wilde, Blumea 15: 265. 1967; Ansari, Fl. Kasaragod Div. 172. 1985; Rao et al., Journ. Econ. Tax. Bot. 11: 243. 1987; Ramach. & V.J. Nair, Fl. Cannanore Dist. 197. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 386. 2009. *Granadilla hondala* Gaertn., Fruct. 2: 480. t.180. f.10. 1791. *Adenia palmata* (Lam.) Engl., Bot. Jahrb. Syst. 14: 375. 1892; Gamble, Fl. Pres. Madras 525(371). 1919. *Modecca palmata* Lam., Encycl. 4: 209. 1797; Hook. f., Fl. Brit. India 2: 603. 1879.

Climbers with tuberous roots, tendrils simple. Leaves palmately 3-5-lobed, lobes to 16 x 6 cm, oblong, membranous, with large circular sessile glands between lobes; petiole to 8 cm long. Flowers monoceous, in axillary cymes, 10 mm across. Calyx 13 mm long, lobes 5, ovate. Petals 5, 13 x 2 mm, linear-

oblong, ciliate, attached at the rim of calyx tube. Stamens 5, free, staminodes in female flowers 5, free. Ovary stipitate, globular, superior, 1-celled; ovules many, parietal, style 1, 3-fid at apex. Capsule 5 cm across, globose, 3-valved.

Near Farm, *KVB 31202*; 'S' Valvu, *NS & KVB 31397*

Fl. & Fr.: March-August

Distribution: Common in Semi-evergreen forests of Valayamchal and Evergreen forests of Cross way, Chavachi and Moonamthode.

PASSIFLORA L., Sp. Pl. 955. 1753.

1a. Bracteoles pinnatisect..... *P. foetida*

1b. Bracteoles not as above..... *P. edulis*

Passiflora edulis Sims in Curtis, Bot. Mag. t. 1989. 1818; Gamble, Fl. Pres. Madras 524(370). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 387. 2009.

Climbing shrubs. Leaves palmately 3-lobed, 9.5 x 8.2 cm, lobes oblong, apex acute or acuminate, margin serrulate, glabrous, basally 3-nerved; petiole to 1.6 cm long; stipules linear. Flowers axillary, solitary, white. Calyx lobes 5. Petals 5, inserted at the throat of calyx tube; corona tinged violet. Stamens 5. Ovary 1-celled; ovules many; styles 3; stigmas capitate. Berry c. 4 cm across.

Kariyenkappu, *KJD 26272*

Fl. & Fr.: Throughout the Year

Distribution: Cultivated in earlier settlements.

Passiflora foetida L., Sp. Pl. 959. 1753; Gamble, Fl. Pres. Madras 524(370). 1919; Manilal & Sivar., Fl. Calicut 118. 1982; Ansari, Fl. Kasaragod Div. 172. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 197. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 387. 2009.

Herbaceous vines; stem, petioles and leaves glandular-hispid. Leaves roughly to deeply 3-5-lobed, 5-7 x 3-5 cm, suborbicular to ovate, cordate at base, lobes acuminate, adpressed glandular-pubescent. Petiole to 1.5 cm long. Stipules deeply dissected to glandular appendaged. Bracts and bracteoles deeply pinnatisect, glandular-pubescent. Flowers axillary, often solitary, 3-4 cm across. Calyx lobes 5, 1-1.5 x 0.6-0.8 cm, broadly ovate, apically spurred. Petals white, shorter than calyx lobes. Coronal segments in 2 whorls; outer coronal hairs many, 0.8-1 cm long; inner ones 2-3 mm long. Gynandrophore 5 mm long. Stamens 5. Ovary 1-celled; ovules many; styles 3; stigma capitate. Berries 1.5-2 cm diam., subglobose, yellow, subtended by the bracts and bracteoles; seeds many, 4-5 mm, ovate, laterally compressed, pitted.

Near Farm, *KJD 26273*

Fl. & Fr.: July-December

Distribution: Near boundaries of Farm.

CUCURBITACEAE

1a. Petals fimbriate *Trichosanthes*

1b. Petals not fimbriate 2

2a. Anther cells conduplicate or flexuous 3

2b. Anther cells erect, straight 5

3a. Calyx tube tubular, anthers included *Gymnopetalum*

3b. Calyx tube companulate, anthers not included 4

4a. Male flowers with large bracts..... *Momordica*

4b. Male flowers without large bracts *Cucumis*

- 5a. Leaves ovate oblong; style not surrounded by annular disc Cayaponia
 5b. Leaves lobbed or deltoied; style surrounded by annular disc 6
 6a. Connective of anthers narrow, anther lobes straight..... Mukia
 6b. Connective of anthers broad, anthers transverse or inclined..... 7
 7a. Leaves amplexicaule..... Solena
 7b. Leaves not amplexicaule Zehneria

CAYAPONIA Silva Manso, Enum. Subst. Braz. 31. 1836.

Cayaponia laciniosa (L.) C. Jeffrey, Kew Bull. 15: 346. 1962. *Bryonia laciniosa* L., Sp. Pl. 1013. 1753, p.p. *Bryonopsis courtallensis* Arn., Hook.'s J. Bot. 3: 274. 1841. *Bryonopsis bennettii* Miq., Fl. Ind. Bat. 1: 657. 1855. *Aechmandra zeylanica* Thw., Enum. Pl. Zeyl. 125. 1859. *Cerasiocarpum zeylanicum* (Thw.) Hook. f. in Benth. & Hook. f., Gen. Pl. 1: 832. 1862 & Hook. f., Fl. Brit. India 2: 629. 1879. *Cerasiocarpum bennettii* (Miq.) Cogn. in A. & C. DC., Monogr. Phan. 3: 729. 1881; Gamble, Fl. Pres. Madras 541(382). 1919; Chakrav., Fasc. Fl. Ind. 11: 18. 1982. *Kedrostis courtallensis* (Arn.) Jeffrey, Kew Bull. 15: 353. 1962; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 391. 2009.

Scabrous creepers. Leaves simple, opposite, 9-13 x 5-7 cm, ovate-oblong, apex acuminate, base cordate, distantly denticulate and coarsely scabrous. Flowers monoecious; male flowers in axillary racemes, female flowers axillary, solitary. Calyx tube campanulate. Petals 5, obovate, free. Stamens in male flowers 3, free, anthers straight. Ovary in female flowers globular, 1-celled; ovules 5-6, style columnar, stigma 3-fid. Berry 8 mm across, globose, smooth; seeds ovoid, marginate.

Kattikari, *KJD 31883*

Fl. & Fr.: August-November

Distribution: Common in Evergreen forests of Kattikari, Pothurumi and Chavachi.

CUCUMIS L., Sp. Pl. 2: 1011. 1753.

- 1a. Connective of anthers laciniate lobed *C. sativus f. hardwickii*
 1b. Connective of anthers hooded, not lobed..... *C. silentvalleyi*

Cucumis silentvalleyi (Manilal, Sabu & Mathew) Ghebret. & Thulin, Novon 17: 178. 2007. *Cucumella silentvalleyii* Manilal, Sabu & Mathew, Acta. Bot. India 13: 283. 1985; Biju in Manoharan et al., Silent Valley-Whispers Reason 172. 1999; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 389. 2009.

Creepers, stems scabrid. Leaves simple, alternate, 4.5 x 5.5 cm, obtusely 5-angular, cordate at base crenate, scabrid; petiole 6 cm long. Flowers monoecious, axillary, solitary, pedicellate. Calyx tube tubular; lobes ovate, acute. Petals 5, 10 x 6 mm, obovate, obtuse, yellow. Stamens 3, free, erect, connective produced into a hood; anthers flexuous, hispid. Ovary fusiform, hispid. Fruit 1.5 x 0.8 cm, ellipsoid, hispid; seeds 3.5 x 2 mm, obovate, compressed, smooth.

Mullenpara, *KJD 26160*

Fl. & Fr.: July-December

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to southern Western Ghats (Kerala)

Cucumis sativus L. **f. hardwickii** (Royle) W.J.de Wilde & Duyfjes, Sandakania 17: 58. 2008. *Cucumis hardwickii* Royle, Ill. Bot. Himal. Mts. 220. t. 47. 1835. *Cucumis prophetarum* sensu Hook. f., Fl. Brit. India 2: 619. 1879; Gamble, Fl.

Pres. Madras 535(378). 1919; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 390. 2009, non L. 1753.

Slender climbers; stems scabrid; tendrils simple. Leaves entire or shallowly 5-lobed, alternate, 12 cm across; scabrous; petiole to 15 cm long. Male flowers in fascicles of 3-5; pedicel to 1 cm long. Calyx tube campanulate, hispid. Petals 7 mm long, obovate, yellow. Stamens 3, anthers flexuous, coherent, connective crested with lacinate lobes. Female flowers solitary, calyx corolla similar to male flowers; ovary oblong, many-ovuled. Berry 3.5 x 2.5 cm, oblong, softly scattered-spinous, greenish-yellow with white stripes; seeds many, compressed.

Paripode, *KJD 18787*

Fl. & Fr.: September-March

Distribution: Rare in Deciduous forests of Paripode.

GYMNOPETALUM Arn., in Hook.'s J. Bot. 3: 278. 1841.

Gymnopetalum tubiflorum (Wight & Arn.) Cogn. in DC., Mon. Phan. 3: 388. 1881; De Wilde & Duyfjes, Blumea 51: 292. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 391. 2009. *Bryonia tubiflora* Wight & Arn., Prodr. 1: 347. 1834. *Gymnopetalum wightii* Arn., Madras J. Lit. Sci. 8: 52. 1840; Hook. f., Fl. Brit. India 2: 611. 1879; Gamble, Fl. Pres. Madras 530(374). 1919; Chakrav., Fasc. Fl. Ind. 11: 54. 1982; Ansari, Fl. Kasaragod Div. 175. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 199. 1988. *Gymnopetalum zeylanicum* Arn., Hook.'s J. Bot. 3:278.1841.

Stem hispid. Leaves ovate-acute, 5-angled or lobed, base cordate, dentate, hirsute, 8 x 5 cm; petiole to 3 cm. Male flowers in axillary umbels, pedicels to 1 cm long. Calyx tube 2.5 cm long. Corolla white. Fruit ellipsoid, 2.5 cm long.

Pothurumi, *NS & KJD 25540*

Fl. & Fr.: October-January

Distribution: Rare in Evergreen forests of Pothurumi.

MOMORDICA L., in Hook.'s J. Bot. 3: 278. 1841.

Momordica sahyadrica Kattuk. & V.T. Antony, Nordic J. Bot. 24: 541. 2007. *Momordica subangulata* sensu Gamble, Fl. Pres. Madras 532(375). 1919; Chakrav., Fasc. Fl. Ind. 11: 95. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 393. 2009, non Blume 1826.

Tendrillar dioecious, perennial climbers with tuberous tap root; tendrils unbranched, 8-15 cm long, the basal 4-5 cm uncoiled. Leaves alternate, entire or 3-5 lobed, 10-16 x 8-18 cm, ovate or broadly triangular in outline, sometimes hastate, apex acute or acuminate, base deeply cordate, margin entire, undulate or coarsely crenulate, lateral veins 5-7 pairs, the lower pair running close to the margin of the basal sinus, hairs short, scattered, white; petiole 3-8 cm long, 1-1.5 mm thick. Male flowers axillary, solitary or a loose fascicle of 5-7 flowers; peduncle 2-5 cm long, pedicels 0.8-1 cm long; bract reniform to 3 x 3 cm, margins cucullate. Sepals free, elliptic oblong, ca 1 x 0.6 cm, yellowish white at center. Petals free, obovate, ca 4 x 2.5 cm, bright yellow, three petals with a small tongue-like ciliate appendage near the base. Stamens 3, two of them with a pair of anthers, the other with a single anther, yellowish orange, filaments up to 3 mm long, anthers 2-3 x 1-2 mm, extrorse, thecae dull black. Female flowers solitary, axillary; peduncle 0.5-2 cm long; pedicel up to 2 cm long, subtended either by a rudimentary (1.3 x 0.5-5 mm)

or reniform ca 2 x 2 cm bract. Sepals green, persistent, lanceolate, 0.8-1.3 x 1-3 mm, acuminate, densely glandular hairy within and without. Petals ca 4 x 2 cm, greenish-yellow and ciliate at base; staminodes 5 (2+2+1), white, cylindrical, touching the style. Ovary oblong-ovoid, 1-1.5 x 0.3-0.5 cm, more or less densely clothed with soft papillae of ca 1 mm length; style ca 6 mm long; stigma ca 4 x 9 mm, 3 lobed, each lobe again 2-lobed. Fruits broadly ellipsoid or ovoid to fusiform, 5-7.5 x 3-4.2 cm, dark green, turning bright orange on ripening, densely clothed with soft short spines 2-4 mm long; pulp carmine red; seeds black, shining, round or slightly cog-wheel-shaped, margin warty-dentate, sculptured on faces with irregular furrows and ridges, 6.2-7.7 x 5.4-6.9 mm.

Chavachi, *KJD 31814*

Fl. & Fr.: June-October

Distribution: Rare in Evergreen forests of Chavachi and Meenmutty.

Endemic to Western Ghats.

MUKIA Arn., Madras J. Lit. Soc. 17 : 50. 1840.

Mukia maderaspatana (L.) Roem., Syn. Monogr. 2: 47. 1846; Manilal & Sivar., Fl. Calicut 123. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 200. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 393. 2009. *Cucumis maderaspatanus* L., Sp. Pl. 1012. 1753. *Bryonia cordifolia* L., Sp. Pl. Pl. 1012. 1753. *Bryonia scabrella* L.f., Suppl. Pl. 424. 1781. *Mukia scabrella* (L. f.) Arn. in Hook.'s, J. Bot. 3: 276. 1841; Hook. f., Fl. Brit. India 2: 623. 1879. *Melothria maderaspatana* (L.) Cogn. in A. & C. DC., Monogr. Phan. 3: 623. 1881; Gamble, Fl. Pres. Madras 539(381). 1919; Chakrav., Fasc. Fl. Ind. 11: 83. 1982; Ansari, Fl. Kasaragod Div. 177. 1985; Vajr., Fl. Palghat Dist. 213. 1990.

Stem coarsely scabrous. Leaves simple, alternate, 8-9 x 6-7 cm, ovate, cordate at base; entire or shallowly 5-lobed; spineous serrate, densely scabrous; petiole 6-7 cm long. Male flowers 8-12 together, 4-6 mm across, yellow; pedicel 5-6 mm long. Calyx densely hairy outside, lobes linear. Petals 2-2.5 mm long, obovate, yellow. Female flowers solitary or 2-3 together. Berry 1-1.5 cm across; seeds obovate, marginate, yellowish white, rugose.

Paripode, *KJD 25465*

Fl. & Fr.: Throughout the year

Distribution: Along the boundaries near Farm.

SOLENA Lour., Lour. Fl. Cochin. 2: 514. 1790.

Solena amplexicaulis (Lam.) Gandhi in Saldanha & Nicolson, Fl. Hassan Dist. 179. 1976; Manilal, Fl. Silent Valley 119. 1988; Ramach. & V.J. Nair, Fl. Cannanore Dist. 200. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 394. 2009. *Bryonia amplexicaulis* Lam., Encycl. 1: 496. 1785. *Solena heterophylla* Lour., Fl. Cochin. 514. 1790; Manilal & Sivar., Fl. Calicut 123. 1982. *Melothria amplexicaulis* (Lam.) Cogn. in A. & C. DC., Monogr. Phan. 3: 621. 1881; Gamble, Fl. Pres. Madras 539(380). 1919; Chakrav., Fasc. Fl. Ind. 11: 77. 1982.

Prostrate or climbing scabrid herbs; tendrils simple. Leaves simple, alternate, very variable, angular or shallowly 3-5-lobed, 4-8 x 3-7 cm, ovate-deltoid, apex acuminate, base cordate, margin denticulate, mucronate, scabrid on both sides; petiole to 6 cm. Male flowers in axillary, sessile clusters. Calyx tube to 2 mm, villous; lobes subulate, erect. Petals 5, 3 mm long, ovate-oblong, obtuse, yellow. Stamens 3, free, inserted at base of calyx tube; anthers

oblong, ciliate. Female flowers solitary or in clusters. Ovary villous. Berry 1.2 cm across, globose, red; seeds lenticular, rugose.

Paripode, *KJD 26255*

Fl. & Fr.: Throughout Year

Distribution: Fairly common in Deciduous forests at Paripode.

TRICHOSANTHES L., Sp. Pl. 1008. 1753.

- 1a. Leaves unlobed, ovate *T. nervifolia*
1b. Leaves palmately lobed 2
2a. Lobes of leaf entire, glabrous *T. tricuspadata*
2b. Lobes of leaf denticulate, hairy *T. lobata*

Trichosanthes lobata Roxb., Fl. Ind. 3: 703. 1832; Hook. f., Fl. Brit. India 2: 610. 1879; Chakrav., Fasc. Fl. Ind. 11: 117. 1982. *Trichosanthes perrottetiana* Cogn. in A. & C. DC., Monogr. Phan. 3: 362. 1881; Gamble, Fl. Pres. Madras 529(373). 1919. *Trichosanthes villosula* Cogn. in A. & C. DC., Monogr. Phan. 3: 362. 1881; Gamble, Fl. Pres. Madras 529(374). 1919; Chakrav., Fasc. Fl. Ind. 11: 122. 1982. *Trichosanthes villosula* Cogn. var. *nilgirensis* Kundu, J. Bombay Nat. Hist. Soc. 43: 375. 1943.

Climbers; stem glandular. Leaves alternate, 5-lobed, 10 cm across, lobes cuspidate, toothed, densely pubescent beneath. Male racemes to 17 cm long, glandular pubescent. Flowers up to 15 in a raceme; pedicel 2.5-4 cm long; bracts 5 mm long, oblanceolate. Calyx tube 2 cm long, puberulus; lobes linear. Petals 3 x 0.7 cm, white, deeply fimbriate into narrow lobes. Female flowers solitary, axillary. Berry 8 x 3 cm, glabrous, green with white lines; seeds 13 x 6 mm, oblong, rugose along margins.

Pothurumi, *NS & KJD 25537*

Fl. & Fr.: November-January

Distribution: Fairly common in Evergreen forests of Pothurumi. Endemic to Peninsular India.

Trichosanthes nervifolia L., Sp. Pl. 1008. 1753; Gamble, Fl. Pres. Madras 529(373). 1919; Chakrav., Fasc. Fl. Ind. 11: 119. 1982; Manilal & Sivar., Fl. Calicut 120. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 395. 2009. *Trichosanthes cuspidata* Lam., Encycl. 1: 188. 1783; Gamble, Fl. Pres. Madras 529(373). 1919.

Scandant herbs; tendrils bifid. Leaves simple, opposite, 6-14 x 5-7 cm, ovate-lanceolate, apex gradually acute, base cordate, margins distantly denticulate, basally 5-nerved, prominent on lower side, membranous; petiole to 3 cm long. Male flowers in racemes; pedicels slender. Calyx-tube c. 1.2 cm long, oblong, dilated above, 5-lobed; lobes filiform. Corolla white, 5-lobed; lobes oblong, fimbriate. Pistillodes 3. Female flowers solitary; ovary 1-locular, ovoid; ovules many; style slender; stigma entire or lobed. Fruit 7-10 x 3-5 cm, ellipsoid, red on ripening; seeds semi-ellipsoid, compressed, rugulose.

Chavachi, *KVB 31537*

Fl. & Fr.: September-May

Distribution: Fairly common in Evergreen forests of Chavachi and Paripode.

Trichosanthes tricuspadata Lour., Fl. Cochinch. 589. 1790; Ramach. & V.J. Nair, Fl. Cannanore Dist. 201. 1988; Subram., Fl. Thenmala Div. 150. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 395. 2009. *Trichosanthes bracteata* (Lam.) Voigt, Hort. Suburb. Calcutt. 58. 1845; Manilal & Sivar., Fl.

Calicut 119. 1982; Ansari, Fl. Kasaragod Div. 179. 1985; Vajr., Fl. Palghat Dist. 215. 1990. *Modecca bracteata* Lam., Encycl. 4: 210. 1797. *Trichosanthes palmata* Roxb., Fl. Ind. 3: 704. 1832; Hook. f., Fl. Brit. India 2: 606. 1879; Gamble, Fl. Pres. Madras 529(374). 1919.

Scabrid climbing herbs; tendrils 2-fid. Leaves up to 19 x 17.2 cm, orbicular-cordate, deeply or shallowly 3-5-lobed, margin dentate. Male flowers in axillary racemes; bracts ovate, often purple. Calyx tube to 6.2 cm, lobes lanceolate. Corolla lobes ovate, yellow, fimbriate. Stamens 3. Female flowers solitary. Berries c. 7 cm across, globose, red with orange streaks.

Cross way, *KJD 26096*

Fl. & Fr.: December-January

Distribution: Rare in Evergreen forests of Cross Way.

ZEHNERIA Endl., Prodr. Fl. Norfolk. 1: 69. 1833.

Zehneria maysorensis (Wight & Arn.) Arn. in Hook.'s, J. Bot. 3: 275. 1841; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 397. 2009. *Bryonia maysorensis* Wight & Arn., Prodr. 345. 1834. *Melothria mucronata* sensu Chakrav. Rec. Bot. Sur. India 17: 148. 1959, non (Blume) Cogn. 1881. *Melothria perpusilla* var. *subtruncata* Cogn. in A. & C. DC., Monogr. Phan 3: 606. 1881; Chakrav., Fasc. Fl. Ind. 11: 86. 1982. *Melothria perpusilla* sensu Gamble, Fl. Pres. Madras 538(380). 1919, non (Blume) Cogn. 1881.

Herbaceous climbers; stem slender, glabrous. Leaves shallowly 3-angled, alternate, 7-8 by 6.5-8 cm, broadly ovate, cordate at base, acute-acuminate at apex, serrate along margins, minutely and densely punctuate above, glabrous to minutely papillate beneath; nerves usually sparsely hispid beneath; petiole 2-3 cm long, glabrous or sparsely hispid beneath near the lamina; tendrils simple. Plants monoecious. Flowers cream-yellow. Male flowers subumbellate; peduncle 2-4 cm long; pedicels ca 2 mm long. Calyx tube campanulate, ca 3 mm long, glabrous outside, hairy inside; lobes minute, teeth-like. Corolla lobes ovate, acute at apex, ca 2.5 mm long. Stamens 3; filaments ca 3 mm long; anthers ca 1 by 1.25 mm, papillose. Disk ca 0.5 by 0.75 mm. Female flowers solitary, axillary or co-axillary to the male peduncle; pedicels ca 2 mm long. Calyx oblong, ca 6 by 2 mm. Style ca 3.5 mm long; stigma spreading. Disk 3-lobed, ca 0.75 by 1.25 mm. Staminodes 3, filiform, ca 3 mm long, hairy. Fruits oblong, ca 1.7 x 1.1 cm, finely reticulate rugose; seeds flattened, broadly obovate, 3.5 by 2 mm, smooth at faces.

Ambalappara, *NS & KVB 31416*

Fl. & Fr.: October-December

Distribution: Common in Plantations of Kariyenkappu and Evergreen forests of Kattikari, Chavachi, Pothurumi and Ambalappara.

DATISCEAE

TETrameLES R. Br., Observ. Pl. Denham & Clapperton 230. 1826.

Tetrameles nudiflora R. Br. in Bennett, Pl. Jav. Rar. 79. t.17. 1838; Hook. f., Fl. Brit. India 2: 627. 1879; Gamble, Fl. Pres. Madras 544(384). 1919; Ansari, Fl. Kasaragod Div. 181. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 400. 2009. *Tetrameles grahamiana* Wight, Ic. t. 1956. 1853.

Deciduous dioecious trees, to 45 m high, bole buttressed; bark 10 mm thick, greyish-white, smooth, tuberculate-lenticellate. Leaves simple, alternate, crowded at the apex of branchlets 7.5-20 x 5-12 cm, orbicular-ovate or broadly ovate, apex acute-acuminate, base cordate, margin glandular-serrate, coriaceous, glabrous above, densely tomentose beneath; petiole 5-15 cm long, slender, tomentose;

nerves 3-5 from base, palmate, prominent, lateral nerves 4-9 pairs, pinnate, prominent, intercostae scalariform, prominent. Flowers unisexual, yellowish-green; female flowers sessile, in spicate pendulous panicles. Male flowers subsessile, in pubescent panicles, 4 mm across, calyx tube very short; lobes 4, ovate, united at base; petals absent; stamens 4, opposite the calyx lobes, inserted around a flat central disc; pistillode rudimentary. Female flowers: 4 x 3 mm; calyx connate with the ovary, 4-gonous; lobes 4, short; petals absent; staminodes absent; ovary inferior, 1-celled, ovules numerous on 4 parietal placentae; styles 4, subulate; stigmas club shaped. Fruit a capsule, 5-6 mm long, urceolate, faintly 8-ribbed, glandular, crowned by persistent calyx segments, opening at top; seeds minute, brown.

Pookundu, *KJD 22536*

Fl. & Fr.: March-May

Distribution: Fairly common in Seni-evergreen forests of Valayamchal to Pothanplavu.

BEGONIACEAE

BEGONIA L., Sp. Pl. 1056. 1753.

- 1a. Placenta divided, small plants with tuberous roots; capsules 2-celled..... 2
- 1b. Placenta undivided, stem elongate, plants rather large; capsules 3-celled..... 3
- 2a. Stem succulent, 1 capsule wing broad..... *B. integrifolia*
- 2b. Stem slender, capsule wings subequal..... *B. crenata*
- 3a. Sepals in male flowers 4..... *B. trichocarpa*
- 3b. Sepals in male flowers 2..... *B. malabarica*

Begonia crenata Dryand., Trans. Linn. Soc. London 1: 164, t.14. 1791; Hook. f., Fl. Brit. India 2: 651. 1879; Gamble, Fl. Pres. Madras 546(385). 1919; Manilal & Sivar., Fl. Calicut 124. 1982; Ansari, Fl. Kasaragod Div. 180. 1985; Kumar et al., Journ. Econ. Tax. Bot. 26: 140. 2002. *Begonia minima* Bedd., Madras J. Lit. Sci. ser. 3, 1: 48. 1864 & Ic. t. 110. 1868-1874.

Small herbs; roots tuberous; stem usually red, smooth. Leaves simple, alternate, 2.5-6 x 1.5-5 cm, ovate or tri-lobed, acute at apex, cordate at base, doubly crenate at margins, hairy above and glabrous except the nerves beneath. Flowers pinkish, beautifully marked with glistening dots when fresh; peduncles slender. Male flowers: tepals 4, outer one elliptic, 5-5.5 x 4-4.5 mm, cordate at base, obtuse at apex; inner one narrower than the outer, 5 x 2 mm, obtuse at apex; stamens about 15, monadelphous; anthers yellow. Female flowers: tepals 5, the outer elliptic, 5-5.5 x 3.5-4 mm; inner one narrower 5 x 2 mm. Styles usually 3, connate to half way up; sigma reniform. Capsule 6-7 mm long, crowned by accrescent perianth, 3-winged, one smaller than the other two, 2-celled; placenta divided.

Ambalappara *KJD 25430*

Fl. & Fr: August-November

Distribution: Rare in Evergreen forests of Ambalappara on wet rocks. Endemic to Western Ghats.

Begonia integrifolia Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 230. 1851; Hook. f., Fl. Brit. India 2: 648. 1879; Gamble, Fl. Pres. Madras 546(385). 1919; Ansari, Fl. Kasaragod Div. 180. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 399. 2009.

Small, tuberous herbs; stem short, reddish, succulent. Leaves simple, alternate, 13-25 x 6-11 cm, ovate, irregularly serrate-dentate, apex acute, base

cordate, slightly oblique, sparsely hairy; petiole 4-15 cm long. Flowers pinkish, unequal, in axillary dichotomously branched cymes. Male flowers: tepals 4 in 2 whorls; outer 2 orbicular, larger. Stamens many; filaments united at base. Female flowers: to 8 mm long, tepals 5, free; inner 1 smaller; ovary inferior; styles 2; stigma branched. Capsule with 3 unequal wings, 1 larger.

Moonamthode, *KJD 31883*

Fl. & Fr.: June-October.

Distribution: Common in Evergreen forests of Chavachi, Chelachode, Moonamthodu and Pothanplavu. Endemic to Peninsular India.

Begonia malabarica Lam., *Encycl.* 1: 393. 1785; Gamble, *Fl. Pres. Madras* 546(386). 1919; R. Ansari et al., *Journ. Econ. Tax. Bot.* 5: 126. 1985; Ansari, *Fl. Kasaragod Div.* 180. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 203. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 399. 2009. *Diploclinium dipetala* Wight, *Ic. t.* 1813. 1852.

Small shrubs, to 2 m high; stem terete, glabrous. Leaves simple, alternate, 15 x 8 cm, ovate, strongly unequal at base, toothed and serrate along the margins, hispid; petiole to 6 cm long; stipule 13 x 5 mm, lanceolate. Peduncles to 3 cm, axillary; cymes 5-10 cm across, dichotomous, flowers many. Male flowers: tepals 2, 15 mm across, orbicular, pink; anthers 2 mm long, connective produced into an orbicular appendage. Female flowers: tepals 7 x 13 mm, reniform. Capsule 2 x 1.5 cm, wings obtuse.

Kattikari, *KVB 31391*

Fl. & Fr. August-April

Distribution: Rare, undergrowth in Evergreen forests of Kattikari and Mullenpara.

Begonia trichocarpa Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 3: 230. 1851; Hook. f., *Fl. Brit. India* 2: 653. 1879; Gamble, *Fl. Pres. Madras* 546(386). 1919; Kumar et al., *Journ. Econ. Tax. Bot.* 26: 137. 2002.

Large herbs; stem reddish, flaccid, sub-erect, hispid. Leaves simple, alternate, 8 x 3 cm, ovate-oblong, acuminate, obliquely cordate at base, hirtus, membranous, 5-nerved from the base; petiole 1-3 cm long, hispid; stipule 6 x 2 mm, lanceolate. Cymes 2 cm across, lateral; peduncle 1-2 cm long, flowers 1-3 together. Male flowers: tepals 4, outer 5 x 7 mm, hispid; inner smaller, curved, glabrous. Female flowers: tepals 4 or 5, similar to male flowers; ovary hispid, 3-locular, placenta single, styles 3, each divided into two branches at apex. Capsule 1 x 2 cm obovate, truncate at apex, wings acute above, subequal; seeds minute, many, hexagonal.

Kattikari State Boundary, *KJD 26320*

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Kattikari and Kurumbankallu. Endemic to Western Ghats; Conservation status: Vulnerable.

MOLLUGINACEAE

GLINUS L. *Sp. Pl.* 1: 463. 1753 [1 May 1753]

Glinus oppositifolius (L.) A. DC., *Bull. Herb. Boissier ser. 2*, 1: 552. 1901; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 204. 1988. *Mollugo oppositifolia* L., *Sp. Pl.* 89. 1753; Gamble, *Fl. Pres. Madras* 552(390). 1919. *Mollugo spergula* L., *Syst. Nat.* (ed. 10) 881. 1759; Hook. f., *Fl. Brit. India* 2: 662. 1879.

Diffuse or prostrate, glabrous herbs. Leaves in whorls of 3-5, unequal, 7-20 x 3-8 mm, obovate-spathulate, base attenuate, apex obtuse or acute, subsucculent, subsessile. Flowers in axillary, 5-8-flowered fascicles; pedicel to 1.5 cm. Tepals 5, 5-6 x 2-3 mm, oblong, with green central stripe, broad thin hyaline margins, apex obtuse or acute, spreading at anthesis, closing again around fruit. Stamens 5, often alternating with linear, bifid staminodes; anthers oblong. Ovary ellipsoid, 3-celled; ovules many; styles 3, recurved; stigmas capitate. Capsule c. 3 mm long, oblong, loculicidal, enclosed in erect calyx. Seeds ovoid, curved, tubercled, dark reddish brown, with a pair of unequal white hilar appendages.

Narikadvu, KVB 31426

Fl. & FR.: February-May

Distribution: Fairly common at Narikkadvu, Pookundu near stream side.

APIACEAE/UMBELLIFERAE

- 1a. Prostrate herbs, rooting at nodes, simple umbels 2
- 1b. Erect leaves, not rooting at nodes, compound umbels 3
- 2a. Leaves palmately lobed, involucre bract absent Hydrocotyle
- 2b. Leaves orbicular, not lobed, involucre bract present Centella
- 3a. Fruit laterally compressed, not winged Pimpinella
- 3b. Fruit dorsally compressed, winged Heracleum

CENTELLA L., Sp. Pl. ed. 2, 1393. 1763.

Centella asiatica (L.) Urban in Mart., Fl. Bras. 11:287. t.78. f. 1879; Gamble, Fl. Pres. Madras 556(392). 1919; Manilal & Sivar., Fl. Calicut 128. 1982; Ansari, Fl. Kasaragod Div. 183. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 205. 1988; P.K. Mukh. & Constance, Umbell. India 15. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 402. 2009. *Hydrocotyle asiatica* L., Sp. Pl. 234. 1753.

Prostrate herbs, rooting at nodes. Leaves simple, alternate, orbicular-reniform, 3-5 cm across, crenate or sub-entire, glabrous, nerves radiating; petiole to 12 cm long, sheathing at base. Flowers sessile, pink, in 2-5 flowered umbels; peduncles 1-2 cm long, axillary. Calyx tube 1 mm long, adnate to the ovary, lobes minute. Petals 4, 1 mm long, oblong, recurved at apex, pink. Stamens 5, filaments erect. Ovary 2-celled, cell 1-ovuled, style erect, bilobed at apex. Fruit ovoid, 3-4 mm long, reticulate-rugose, 7-9-ribbed.

Kariyenkappu, KJD 18766

Fl. & Fr.: Throughout the year

Distribution: In former settlements.

HERACLEUM L., Sp. Pl. 249. 1753.

Heracleum candolleianum (Wight & Arn.) Gamble, Fl. Pres. Madras 565(399). 1919; P.K. Mukh. & Constance, Umbell. India 243. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 403. 2009. *Pastinaca candolleiana* Wight & Arn., Prodr. 372. 1834. *Heracleum rigens* Wall. ex DC. var. *candolleiana* (Wight & Arn.) Clarke in Hook. f., Fl. Brit. India 2: 715. 1879, p. p. *Heracleum rigens* var. *ligusticifolium* (Wight) Clarke in Hook. f., Fl. Brit. India 2: 716. 1879. *Heracleum courtallense* Gamble, Fl. Pres. Madras 565(399). 1919.

Shrubs, stem ridged. Leaves alternate, 35-45 x 20-25 cm, 1 or 2 pinnate; leaflets 7-9 or more, to 15 x 10 cm, lobed, apex acute, serrate, scabrous, coriaceous. Umbels compound, terminal, corymbose; secondary peduncles to

6 cm long; rays 13, each 3-5 cm long, spreading; pedicels 6-10 mm long, many-together, spreading. Flowers 5-merous, 2 mm across. Calyx 5-toothed. Petals 3, ovate, acuminate, with a strong midrib, glabrous. Stamens 5, free, anthers ovate. Ovary compressed. Fruit 7-10 x 4-7 mm, biconvex, dorsally compressed, winged, glabrous.

Ambalappara, *KJD 25507*

Fl. & Fr.: April-October

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

HYDROCOTYLE L., Sp. Pl. 234. 1753.

Hydrocotyle javanica Thunb., Diss. Hydroc. n. 17. t. 2. 1798; Gamble, Fl. Pres. Madras 556(392). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 206. 1988; P.K. Mukh. & Constance, Umbell. India 11. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 404. 2009. *Hydrocotyle hispida* Buch.-Ham ex D. Don, Prodr. Fl. Nepal. 182. 1825. *Hydrocotyle polycephala* Wight & Arn., Prodr. 366. 1834.

Prostrate herbs, rooting at nodes; young stem, peduncle and pedicels densely pubescent with curled hairs. Leaves alternate, 1.5-3.5 x 2.5-6 cm, orbicular, broader than long, 7-9 lobed, 7-9 ribbed, sparsely hairy on both sides, variously serrate on margins. Flowers sessile in capitate clusters, umbelled on 1-6 cm long peduncles; pedicels 0.5-2 cm long; involucre bracts scaly. Calyx tube 0.5 cm long, 5-toothed. Petals 5, 0.05-0.1 cm long, lanceolate. Stamens 5. Ovary 0.05-0.1 cm long, 2-celled, laterally compressed; styles 2; stigma capitate. Fruit 0.1-0.15 x 0.05-0.2 cm, 3-ridged.

Pothurumi, *KVB 31725*

Fl. & Fr.: October-May

Distribution: Common in Evergreen forests of Kattikari, Chavachi and Pothurumi.

PIMPINELLA L., Sp. Pl. 263. 1753.

Pimpinella heyneana (DC.) Kurz, J. Asiat. Soc. Bengal 46: 115. 1877; Gamble, Fl. Pres. Madras 560(395). 1919; Ansari, Fl. Kasaragod Div. 184. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 207. 1988; P.K. Mukh. & Constance, Umbell. India 145. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 405. 2009. *Helosciadium heyneanum* DC., Prodr. 4: 106. 1830.

Erect or decumbent herbs, stem terete. Leaves alternate, 5-7 cm across, lower leaves orbicular, upper ones 3-lobed, base cordate, toothed; petiole 1-6 cm long, sheathing at base. Umbels terminal, paniced; rays 10; secondary rays many, each 3 cm long. Flowers 9-16 in an umbellule, 1.5 mm across, white; pedicels 5 mm long. Calyx shortly 5-toothed. Petals 5, 1 mm long, orbicular. Stamens 5. Fruit 3 x 2 mm, ovate, densely villous, rugose.

Ambalappara, *KJD 26304*; *KVB 31785*

Fl. & Fr.: August-February

Distribution: Fairly common in Grasslands of Ambalappara.

ARALIACEAE

SCHEFFLERA J.R. & G. Forst., Charact. Gen. 45. 1776.

- 1a. Main nerves not prominent, shrubs, not straggaling *S. wallichiana*
- 1b. Main nerves prominent, straggaling shrubs 2
- 2a. Leaves chartaceous; panicles long *S. roxburghii*
- 2b. Leaves coriaceous; panicles short *S. venulosa*

Schefflera roxburghii Gamble, Fl. Pres. Madras 570(402). 1919; Subram., Indian For. 96: 529. 1970. *Schefflera venulosa* (Wight & Arn) Harmes var. *roxburghii* (Gamble) Khanna, Journ. Econ. Tax. Bot. 26:144. 2002.

Large straggling or climbing shrubs. Leaves alternate, digitate, leaflets chartaceous, up to 15 x 6 cm, ovate-elliptic, apex acute, main nerves scarcely more prominent than the secondary and reticulations. Flowers in panicles of umbels or compound racemes, usually terminal; bracts usually deciduous; bracteoles 0 or few, sometimes united in a tube; pedicels, if present, not jointed. Calyx-mouth truncate or toothed. Petals 5 or 6 or many, valvate. Stamens as many as the petals. Ovary-cells as many as the petals; styles short, free. Drupes 5-6 angled; seeds compressed.

Ambalappara, KVB 31365; Chavachi KVB 31396

Fl. & Fr.: May-July

Distribution: Fairly common in Evergreen forests of Chavachi and Ambalappara; Plantations of Kariyenkappu. Endemic to southern Western Ghats.

Schefflera venulosa (Wight & Arn.) Harms in Engl. & Prantl, Naturl. Pflanzenfam. 3(8): 39. 1894; Gamble, Fl. Pres. Madras 570(403). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 208. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 408. 2009. *Paratropia venulosa* Wight & Arn., Prodr. 377. 1834. *Heptapleurum venulosum* (Wight & Arn.) Seem., J. Bot. 3: 80. 1865; Hook. f., Fl. Brit. India 2: 729. 1879, p.p.

Small trees, branchlets 0.5-0.7 cm thick. Leaves 5 or 6 foliolate; leaflets 10-14 x 5-8 cm, ovate-oblong, apex abruptly acuminate, base rounded; nervules prominently reticulate; petiolule 7-10 cm long; stipule 5 mm broad, black. Panicles 20 cm across, glabrous; umbels 2 cm across, 3-12 flowered. Flowers brown; pedicel 8-12 mm long. Calyx truncate. Petals 2 x 2.5 mm, triangular. Drupe 4 x 4 mm, globose, 5-angled.

Ambalappara, KVB 31366

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Ambalappara.

Schefflera wallichiana (Wight & Arn.) Harms in Engl. & Prantl, Naturl. Pflanzenfam. 3(8): 38. 1894; Gamble, Fl. Pres. Madras 570(403). 1919; Ramach. & V.J. Nair, Fl. Cannanore Dist. 209. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 409. 2009. *Paratropia wallichiana* Wight & Arn., Prodr. 77. 1834. *Heptapleurum wallichianum* (Wight & Arn.) Clarke in Hook. f., Fl. Brit. India 2: 730. 1879.

Trees, sometimes epiphytic on other trees; up to 12 m high; bark 5-8 mm thick, surface grey, rough; branchlets 2 cm thick. Leaves digitately, compound, alternate, leaflets 5-8, 14-24 x 5-8 cm, oblong or ovate, apex obtusely acuminate or acute, base subcordate, truncate or round margin entire, coriaceous, glabrous; stipules adnate within the petiole, 1.5 cm broad, hyaline; rachis 17-37 cm long, stout, cylindrical, glabrous, sheathing at base; petiolule 4-6.5 cm long, whorled, stout; lateral nerves 10-21 pairs, very slender, nearly horizontal; intercostae obscure. Flowers bisexual, pale green, 6-8 mm across, 12-20 together in umbels on elongate racemes arranged in panicles on short axis; pedicel 7 mm long. Calyx truncate. Petals 5, valvate, cohering in to a cap above the stamens. Stamens 5. Ovary inferior, syncarpus, cells as many as petals; style absent; stigma sessile. Fruit a berry, 5-6 mm across, globose, 5 angled, crowned with disc; pyrenes 5, 1-seeded.

Ambalappara, KVB 31364

Fl. & Fr.: April-May

Distribution: Rare in Evergreen forests of Ambalappara.

ALANGIACEAE

ALANGIUM Lam. Encycl. [J. Lamarck & al.] 1: 174. 1783 [2 Dec 1783] ; nom. cons.

Alangium salviifolium (L.f.) Wang. **ssp. hexapetalum** (Lam.) Wang. in Engl., Pflanzenreich Alangiaceae. 9. 1910; Gamble, Fl. Pres. Madras 572(404). 1919; Manilal & Sivar., Fl. Calicut 128. 1982; Ansari, Fl. Kasaragod Div. 184. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 209. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 410. 2009. *Alangium hexapetalum* Lam., Encycl. 1: 175. 1783. *Alangium salviifolium* var. *hexapetalum* (Lam.) Gamble, Fl. Madras 3: 572(404). 1919. *Alangium glandulosum* Thw., Enum. Pl. Zeyl. 133. 1859. *Alangium salviifolium* (L. f.) Wang. **ssp. sundanum** (Miq.) Bloem., Bull. Jard. Bot. Buitenz. Ill, 16: 156. 1939; Matthew in Nayar et al., Fasc. Fl. Ind. 19: 5. 1988.

Leaves 13-18 x 5-7 cm, obovate-oblong, apex acuminate, base round to subcordate, nerves 5 pairs, lowest pair from the base, rib-like; nervules reticulate, subparallel; petiole to 1 cm long. Flowers 2 cm long, in axillary fascicles; pedicels 8 mm long pubescent; calyx cupular, 5 mm across, 7-toothed, densely tomentose; petals 7, each 17 x 2 mm, linear-oblong, tomentose; stamens 14, filaments 8 mm long, ciliate below; anthers 7 mm long, linear; ovary inferior, 1-celled, ovule solitary, style 1, elongate, stigma capitate. Berry 2 x 1.3 cm, ellipsoid, tomentose.

Kariyenkappu, KVB 31364

Fl. & Fr.: March-August

Distribution: Rare in Semi-evergreen forests of Pothanplavu.

RUBIACEAE

- 1a. Flowers aggregated in globose heads 2
- 1b. Flowers not so 4
- 2a. Calyces of individual flowers connate at base..... Ochreinauclea
- 2b. Calyces of individual flowers free 3
- 3a. Flowers ebracteate, leaves broadly ovate, 30 cm or more Neolamarckia
- 3b. Flowers bracteate, leaves oblong, 10-20 cm Mitragyna
- 4a. Cells of ovary more than 2 ovuled 5
- 4b. Cells of ovary 1-ovuled 16
- 5a. Straggling climbers, shrubs or small trees 6
- 5b. Herbs or under shrubs 9
- 6a. Straggling climbers Mussaenda
- 6b. Shrubs or small trees 7
- 7a. Fruit capsular Wendlandia
- 7b. Fruit berry 8
- 8a. Plants armed, spines long, solitary, axillary Catunaregam
- 8b. Plants unarmed Discospermum
- 9a. Corolla lobes dentate.....Dentella
- 9b. Corolla lobes entire 10
- 10a. Ovary 5-6 cells..... Mycetia
- 10b. Ovary 2-4 celled..... 11
- 11a. Anthers dehiscent by apical pores 12
- 11b. Anthers dehiscent laterally 13
- 12a. Stigma 1, inflorescence below 10 cm Argostemma
- 12b. Stigma 2, inflorescence 10-15 cm Neurocalyx
- 13a. Calyx lobes 5, fruits compressed, obcordate Ophiorrhiza
- 13b. Calyx lobes 4, fruits subglobose or 4-angled 14

14a. Fruits few seeded. Seeds with ventral cavity	Neanotis
14b. Fruits many seeded, seeds with out a ventral cavity.....	15
15a. Perinial, woody large herbs or under shrubs	Hedyotis
15b. Annual, small herbs	Oldenlandia
16a. Herbs or undershrubs.....	17
16b. Climbers, shrubs or small trees.....	19
17a. Flowers 4-merous, erect herbs or undershrubs.....	18
17b. Flowers 5-merous, creeping herbs	Geophila
18a. Woody erect herbs or undershrubs, Inflorescence cymose	Knoxia
18b. Small herbs, inflorescence compressed at node.....	Spermaceoe
19a. Climbers, stem 4-angled	Rubia
19b. Stragglng or erect shrubs or small trees	20
20a. Thorny shrubs or stragglng shrubs	Canthium
20b. Thron less shrubs or small trees	21
21a. Flowers in cymes	22
21b. Flowers few, clustered.....	25
22a. Flowers 4-merous	23
22b. Flowers 5-merous	24
23a. Stigma entire	Pavetta
23b. Stigma divided	Ixora
24a. Corolla tube stright, ovary 2-loculed.....	Psychotria
24b. Corolla tube curved, ovary 1-loculed.....	Chassalia
25a. Leaves sessile or sub sessile.....	Saprosma
25b. Leaves petioled	Lasianthus

ARGOSTEMMA Wall., in Roxburgh, Fl. Ind. 2: 324. 1824.

- 1a. Leaves broadly orbicular-ovate *A. courtallense*
 1b. Leaves lanceolate or ovate-lanceolate..... *A. verticillatum*

Argostemma courtallense Arn., Ann. Nat. Hist. 3: 22. 1839; Hook. f., Fl. Brit. India 3: 42. 1880; Gamble, Fl. Pres. Madras 590(417). 1921; Manilal & Sivar., Fl. Calicut 139. 1982; Ansari, Fl. Kasaragod Div. 187. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 211. 1988; Sivar., J. Bombay Nat. Hist. Soc. 63: 462. 1984; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 412. 2009.

Erect herbs with a tuberous root stock. Leaves simple, opposite, 8 cm across, few, orbicular, cordate at base, villous above; petiole 0-2 cm; stipule 8 mm long, ovate, entire. Cymes terminal, 1-3 cm across; peduncle 3-6 cm long, 1-3 together. Flowers few, 10 mm long, pedicelled. Calyx tube turbinate, lobes 4, ovate. Corolla tube broad, glabrous; lobes 4, ovate, white. Stamens 4, included, anthers lanceolate. Ovary 2-celled; ovules many; style slender, stigma terminal, globose.

Kannadivechakunnu, *KJD 26191*

Fl. & Fr.: June-October

Distribution: Common in Evergreen forests of Cross way, Chavachi, Moonamthode and Kannadivechakunnu. Endemic to Inadia.

Argostemma verticillatum Wall. in Roxb., Fl. Ind. 2: 325. 1824 & Pl. Asiat. Rar. 2. t.185. 1831; Hook. f., Fl. Brit. India 3: 43. 1880; Gamble, Fl. Pres. Madras 590(417). 1921; Sasidh. & Sivar., Fl. Pl. Thrissur For. 216. 1996.

Small herbs. Leaves in whorls of 3 or 4, mostly confined to the apex of stem, to 5 x 1 cm, linear-lanceolate, subsessile, membranous, glabrous; lateral nerves indistinct; stipules interpetiolar, entire or 0. Flowers 5-merous, 1.2 cm across, in terminal few flowered umbels, peduncles slender, shorter than the leaves. Calyx glabrous, lobes ovate-acute. Corolla white, lobes ovate-

acuminate. Staminal filaments short, anthers connate, dehiscence by apical pores. Ovules many on projected placenta; style filiform; stigma capitate.

Kannadivechakunnu, *KJD 26192*

Fl. & Fr.: August-October

Distribution: Rare in Evergreen forests of Kannadivechakunnu.

CANTHIUM Lam., *Encycl. Meth., Bot.* 1: 602. 1785.

1a. Stems with supra axillary arms, flowers not or very short peduncled..... 2

1b. Stems without or very rarely armed, flowers peduncled..... *C. travancoricum*

2a. Flowers 5-merous, leaves cordate at base *C. rheedei*

2b. Flowers 4-merous, leaves not cordate..... *C. coromandelicum*

Canthium coromandelicum (Burm. f.) Alston in Trimen, *Handb. Fl. Ceylon (Suppl.)* 6: 152. 1903; Sunil & Sivadasan, *Fl. Alappuzha Dist.* 342. 2009. *Gmelina coromandelica* Burm. f., *Fl. Ind.* 132. 1768. *Canthium parviflorum* Lam., *Encycl.* 1: 602. 1788; Hook. f., *Fl. Brit. India* 3: 136. 1880; Manilal & Sivar., *Fl. Calicut* 130. 1982; Ansari, *Fl. Kasaragod Div.* 187. 1985; Mohanan & Sivad., *Fl. Agasthyamala* 310. 2002. *Plectronia parviflora* (Lam.) Bedd., *For. Man. Bot.* 134/5. 1872; Gamble, *Fl. Pres. Madras* 625(441). 1921.

Armed shrubs; branchlets obtusely 4-angled; bark grey; spines 1-3.2 cm long, supra-axillary. Leaves simple, opposite, 1.8-4.2 x 1.3-3 cm, ovate, elliptic-ovate to obovate, apex subacute, base rounded to attenuate; petiole c. 5 mm long; stipules subulate. Flowers greenish, 4-merous, in axillary, sessile cymes below spines. Calyx cupular, 4-toothed. Corolla 4-5 mm across, campanulate to globose, mouth villous; lobes 4, ovate, acute, spreading or reflexed. Stamens 4, subsessile, exserted. Stigma capitate, slightly 2-lobed. Fruit 1-1.4 cm across, subglobose, yellow.

Ambalappara, *KJD 31965*

Fl. & Fr.: April-June

Distribution: Fairly common in Evergreen forests of Ambalappara.

Canthium rheedei DC., *Prodr.* 4: 474. 1830, 'rheedii'; Hook. f., *Fl. Brit. India* 3: 134. 1880; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 414. 2009. *Plectronia rheedei* (DC.) Bedd., *For. Man. Bot.* 134/5. 1872; Gamble, *Fl. Pres. Madras* 625(441). 1921.

Armed shrubs; spines supra-axillary. Leaves simple, opposite, 2-5.5 x 1.5-3.5 cm, ovate, elliptic-ovate or lanceolate, apex acute to acuminate, base rounded or cordate, chartaceous; petiole to 3 mm long; stipules filiform. Flowers in a few-flowered, axillary fascicles. Calyx 1.5 mm long, cupular, 5-toothed. Corolla white, 5-6 mm across; tube 3-4 mm long, slightly constricted above, furnished with a curtain of stiff reflexed hairs within; lobes 5, lanceolate, acuminate, reflexed. Stamens 5; filaments c. 2 mm long. Ovary c. 1 x 1 mm, compressed; stigma acute. Drupe 7-10 mm across, obcordate, compressed; pyrenes rugose.

Cross Way, *KJD 31813*; Moonamthode; Ambalappara *31709*

Fl. & Fr.: March-June

Distribution: Common in Evergreen forests of Cross way, Chelachode and Chavachi; plantations of Kariyenkappu. Endemic to Peninsular India

Canthium travancoricum (Bedd.) Hook. f., *Fl. Brit. India* 3: 134. 1880; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 212. 1988; Ratheesh Narayanan, *Fl.*

Stud. Wayanad Dist. 414. 2009. *Plectronia travancorica* Bedd., Ic. t. 239. 1868-1874; Gamble, Fl. Pres. Madras 625(441). 1921.

Unarmed shrubs or small trees with scandent branches. Leaves simple, opposite, 7 x 4.5 cm, ovate, acute, membranous; nerves 4-7 pairs; petiole 1-1.5 cm long; stipule orbicular, densely villous inside. Cymes 1-3 cm across, peduncled, with many slender villous branches. Flowers 6 mm long. Calyx 2 mm long, teeth acute, glabrous. Corolla white, tube densely villous near the mouth, lobes ovate, acute. Style glabrous, 4 mm long. Fruit flattened, orbicular, 1 cm across; pyrenes rugose.

Meenmutty, *KJD 31486*

Fl. & Fr.: March-August

Distribution: Rare in Evergreen forests of Meenmutty. Endemic to southern Western Ghats.

CHASSALIA Comm. ex Poir., in Dict. Sc. Nat. 8: 198. 1817.

Chassalia curviflora (Wall. ex Kurz) Thw. var. **ophioxyloides** (Wall.) Deb & Krishna, Bull. Bot. Surv. India 24: 222. 1982(1983); Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 416. 2009. *Psychotria ophioxyloides* Wall. in Roxb., Fl. Ind. 2: 167. 1824. *Chassalia curviflora* (Wall. ex Kurz) Thw., Enum. Pl. Zeyl. 150 1859; Hook. f., Fl. Brit. India 3: 176. 1880 p.p; Gamble, Fl. Pres. Madras 643 (453). 1921. *Chassalia ophioxyloides* (Wall. ex Kurz) Craib, Gard. Bull. Straits Settlem. 6:474.1930; Ansari, Fl. Kasaragod Div. 188. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 213. 1988; Sunil & Sivadasan, Fl. Alappuzha Dist. 344. 2009.

Shrubs, to 1.5 m tall. Leaves simple, opposite, 22 x 8 cm, oblanceolate, abruptly acuminate; nerves 12 pairs, regular; petiole to 3 cm long, stipule connate, ovate, membraneous, 2-fid. Cymes 7 x 4 cm, terminal, paniced, glabrous. Flowers 15 mm long, subsessile. Calyx 1.5 mm long, globose, lobes 5, ovate. Corolla 8 mm long, curved, tube purple with yellowish mouth, lobes ovate, obtuse. Stamens 5, included; anthers linear. Ovary 2-celled, ovule one in each cell; style 2-fid at apex. Fruit 6 mm across, globose, glabrous; seeds 2.

Chavachi, *KJD 26095; KVB 31313*

Fl. & Fr.: June-February

Distribution: Rare in Evergreen forests of Chavachi and Semi-evergreen forests of Paripode.

COFFEA L., Sp. Pl. 172. 1753.

Coffea arabica L., Sp. Pl. 172. 1753; Hook. f., Fl. Brit. India 3: 153. 1880; Gamble, Fl. Pres. Madras 636(449). 1921; Manilal & Sivar., Fl. Calicut 147. 1982; Ansari, Fl. Kasaragod Div. 188. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 453. 2009.

Glabrous shrubs to small trees. Leaves simple, opposite, 12-18 cm long, oblong, acuminate, narrowed into short petiole; main lateral nerves 6-10 pairs, joined by intramarginal veins and slender parallel reticulate veins. Flowers fragrant, numerous, borne in axillary fascicles. Corolla funnel-shaped, lobes oblong and as long as the tube. Fruit small, fleshy, berry, dark purple when ripe.

Chavachi, *KJD 18728*

Fl. & Fr.: March-December

Distribution: cultivated

DENTELELLA J.R.Forst. & G.Forst., Char. Gen. Pl. 13. 1775.

Dentella repens (L.) J. R. Forst. & G. Forst., Char. Gen. Pl. 26. t.13. 1776; Hook. f., Fl. Brit. India 3: 42. 1880; Gamble, Fl. Pres. Madras 590(416). 1921; Manilal & Sivar., Fl. Calicut 139. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 214. 1988. *Oldenlandia repens* L., Mant. Pl. 1: 40. 1767.

Small prostrate herbs, rooting at nodes. Leaves simple, subsessile, 4-5 x 1.5-2 mm, obovate, oblong to spatulate, base narrowed, apex acute; stipules connate. Flowers axillary, solitary, sessile. Calyx tube c. 1 mm long; lobes 5, subulate, curled hairy. Corolla white; tube 2-3 mm long, funnel-shaped, hairy within; lobes 5, ovate-acute, toothed. Stamens 5, included, attached in the middle of corolla tube; anthers linear. Ovary 2-celled; style filiform; stigma 2-lobed. Fruits c. 3 mm diam., globular, indehiscent, tomentose, crowned by the persistent calyx; seeds minute, angular, brown, rugose.

Narikkadvu, *KJD 18795*

Fl. & Fr.: March-April

Distribution: Rare in moist localities.

DISCOSPERMUM Dalzell, Hook.'s J. Bot. Kew Gard. Misc. 2: 257. 1850.

Discospermum apiocarpum Dalz. ex Hook.f., Hook.'s J. Bot. Kew Gard. Misc. 2: 257. 1850. *Tricalysia apiocarpa* (Dalz. ex Hook. f.) Gamble, Fl. Pres. Madras 620 (437). 1921; Mohanan & Sivad., Fl. Agasthyamala 364. 2002. *Diplospora apiocarpa* (Dalz. ex Hook. f.) Bedd., Fl. Sylv. t. 223. 1872; Hook. f., Fl. Brit. India 3: 123. 1880.

Small trees; branches very strong; young stem 4-angled. Leaves simple, opposite, 6-10 x 2.5-6 cm, elliptic to ovate lanceolate, shortly acuminate at apex, attenuate at base; lateral nerves 4-5, venation prominent. Cymes sessile or shortly peduncled. Calyx tube 0.1 cm long, minutely 4-toothed. Corolla tube c. 0.1 cm long, 4-lobed; lobes 0.25-0.3 cm long, ovate. Stamens 4, exerted; filaments hairy at base. Ovary 2-celled, rarely 3-celled; ovules 2-5 in each cell; style short; stigma 2-lobed, linear. Berry 0.8-1 x 0.5-0.6 cm, ovoid; seeds 0.6-0.7 cm long, laterally compressed.

Ambalappara *KJD 26328; KVB 31352*

Fl. & Fr.: February-August

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthipara. Endemic to Western Ghats.

GEOPHILA D.Don, Fl. Nepal. 136. 1825, *nom. cons.*

Geophila repens (L.) Johnst., Sargentia 8: 281. 1949; Ansari, Fl. Kasaragod Div. 189. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 214. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 416. 2009. *Rondeletia repens* L., Syst. Nat. (ed.10) 928. 1759. *Geophila reniformis* D. Don, Prodr. Fl. Nepal. 136. 1825; Hook. f., Fl. Brit. India 3:178.1880; Gamble, Fl. Pres. Madras 643(454). 1921. *Geophila herbacea* (Jacq.) K. Schum. in Engl. & Prantl, Naturl. Pflanzenfam. 4(4): 199. 1891.

Prostrate herbs; stem slender, stolon-like. Leaves simple, 1.5-2.5 x 1-2 cm, orbicular or broadly ovate to reniform, apex rounded or retuse, base cordate, chartaceous, basally 5-7-nerved; petiole to 5 cm long. Flowers solitary or in few-flowered umbels; peduncles to 4 cm long. Calyx tube short; lobes subulate, 3 mm long, persistent. Corolla 1-1.5 cm across, funnel-shaped, hairy within, white; lobes recurved, ovate-acute. Stamens 5, included. Ovary

2-locular; ovule 1-per locule. Berry c. 7 mm across, globose, scarlet; seeds plano-convex.

Pookundu, *KJD 26383*

Fl. & Fr.: August-April

Distribution: Fairly common in Semi-evergreen forests of Narikkadvu and Pookundu.

HEDYOTIS L., Sp. Pl. 101. 1753.

- 1a. Flowers in axillary sessile clusters, herbs..... 2
1b. Flowers in terminal or upper axillary panicles, shrubs *H. leschenaultiana*
2a. Flowers blue in colour *H. cyanantha*
2b. Flowers white in colour *H. neesiana*

Hedyotis cyanantha Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 45: 136. 1876; Dutta & Deb, Taxonomic Revision Hedyotis 167. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 418. 2009. *Hedyotis caerulea* Wight & Arn., Prodr. 412. 1834, nom. illeg.; Hook. f., Fl. Brit. India 3: 60. 1880; Manilal & Sivar., Fl. Calicut 141. 1982; Ansari, Fl. Kasaragod Div. 191. 1985. *Oldenlandia caerulea* (Wight & Arn.) Gamble, Fl. Pres. Madras 597(421). 1921, nom. illeg.

Erect annual herba, branching below; root-stock stout, branching; stem 6-18 cm long, stiff, terete, setaceous. Leaves simple, sessile, opposite or verticillate, 1-1.5 x 0.2 cm, linear, aristate at apex, coriaceous, punctate, rigid, revolute at margin, setaceous above and along midrib below; stipules 2-2.2 x 1-2 mm, white, membranous, with 3-4 bristles, 3-3.5 mm long. Inflorescence axillary or terminal capitate cymes with 3-4 flowers. Flowers sessile or shortly pedicelled, 4-5 mm long; pedicel up to 1 mm long, setaceous. Hypanthium globose, 0.7-1 mm long. Calyx limb 0.5-1 mm long, setaceous; lobes 4, 1-1.5 x 0.1-0.12 mm, triangular-lanceolate, aristate at apex. Corolla 3-4 mm long, blue; tube 1-1.5 mm long, glabrous inside; lobes 4, 2.5-3 x 1 mm, lanceolate to linear-lanceolate, 3 nerved, minute puberulous inside, incurved at apex. Stamens 4, exserted, longer than corolla lobes; filaments 3-3.5 mm long, attached near sinus of corolla lobes, ciliate at base; anthers oblong, 0.5-0.8 mm long. Ovary 0.5-0.8 mm long, ovules many; style slender, 4-5 mm long; stigma bifid, 0.5-1 mm long, linear, feathery. Capsules globose or ovoid, 2-4 x 1.5-2 mm, notched at apex, subcoriaceous, ribbed, punctate setaceous, with rigid calyx teeth, loculicidal on crown only; seeds 40-70, 0.1-0.15 mm, triangular, narrowly winged, reticulate, very often orbicular.

Ambalappara, *KJD 26144*

Fl. & Fr.: October-June

Distribution: Rare in Grasslands of Ambalappara.

Hedyotis leschenaultiana DC., Prodr. 4: 422. 1830; Deb & Dutta, Taxon 34: 296. 1985; Dutta & Deb, Taxonomic Revision Hedyotis 75. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 418. 2009. *Hedyotis stylosa* R. Br. ex Wight & Arn., Prodr. 407. 1834; Hook. f., Fl. Brit. India 3: 51. 1880. *Oldenlandia stylosa* (R. Br. ex Wight & Arn.) O. Ktze., Rev. Gen. Pl. 1: 292. 1891; Gamble, Fl. Pres. Madras 598(422). 1921. *Oldenlandia anamalayana* Gamble, Bull. Misc. Inform. Kew 1920: 67. 1920 & Gamble, Fl. Pres. Madras 599(422). 1921. *Hedyotis anamalayana* (Gamble) R. Rao & Hemadri, Indian For. 99: 378. 1973. *Oldenlandia sisparensis* (Gage) Gamble, Fl. Pres. Madras 599(422). 1921.

Stout shrubs, to 50 cm high; stem 4-angled, glabrous or pubescent along 4 lines. Leaves simple, opposite, ovate, acute, rounded at base, glabrous, nerves 5 pairs; petiole 5 mm long; stipule ovate, laciniate, densely hirtus. Cymes terminal and upper axillary, 3-5 cm across, paniced; pedicel 5 mm long, stout, glabrous. Calyx limb 2 mm long, lobes obtuse, glabrous. Corolla pink, 8 mm long, tube slender, villous within, lobes 4 mm long, oblong, obtuse, spreading. Anthers 1 mm long, sessile, adnated by the centre; style 6 mm long.

Ambalappara, *KVB 31645; KJD 26330*

Fl. & Fr.: November-March

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Hedyotis neesiana Arn., Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 18: 341. 1836; Dutta & Deb, Taxonomic Revision Hedyotis 174. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 419. 2009. *Hedyotis nitida* Wight & Arn., Prodr. 412. 1834, nom. illeg.; Hook. f., Fl. Brit. India 3: 61. 1880; Ansari, Fl. Kasaragod Div. 193. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 217. 1988. *Oldenlandia nitida* (Wight & Arn.) Gamble, Fl. Pres. Madras 597(421). 1921; Vajr., Fl. Palghat Dist. 240. 1990.

Prostrate woody herbs; stems 4-angled, coarsely scabrid. Leaves simple, opposite, to 7 x 1 cm, linear-lanceolate to elliptic, coriaceous, pale below; stipule 8 mm long, ovate, rounded at apex, strongly long-toothed, villous. Flowers sessile in axillary clusters, 1-3 together. Calyx 4 mm long, lobes acute, ciliate. Corolla 4-5 mm long, lobes spreading, white. Capsule 3 x 2 mm, ovoid, glabrous; seeds angled; deep brown, ovoid, glabrous.

Chavachi, *KVB 31468*

Fl. & Fr.: September-December

Distribution: Fairly common in Evergreen forests of Chavachi and Plantations of Kariyenkappu.

IXORA L., Sp. Pl. 110. 1753.

- 1a. Corolla tube more than 1.5 cm 2
- 1b. Corolla tube less than 1.2 cm 4
- 2a. Leaves cordate, sessile..... *I. coccinea*
- 2b. Leaves acute or rounded, petiolate..... 3
- 3a. Flowers greenish yellow or greenish; small shrubs *I. malabarica*
- 3b. Flowers white; large shrubs *I. polyantha*
- 4a. Small trees; cymes paniced..... *I. brachiata*
- 4b. Shrubs; cymes not in panicles 5
- 5a. Peduncles 10-15 cm long, cymes corymbose 6
- 5b. Peduncles less than 10 cm, cymes paniced *I. nigricans*
- 6a. Inflorescence pendent branched corymbose cymes *I. sivarajiana*
- 6b. Inflorescence on erect congested corymbs..... *I. elongata*

Ixora brachiata Roxb. ex DC., Prodr. 4: 488. 1830; Hook. f., Fl. Brit. India 3: 142. 1880; Gamble, Fl. Pres. Madras 631(445). 1921; Ansari, Fl. Kasaragod Div. 195. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 219. 1988; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 161.1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 421. 2009.

Evergreen trees, to 8 m high, bark smooth, greyish-brown; branchlets terete, glabrous. Leaves simple, opposite, decussate, 7.5-20 x 3-7 cm, elliptic-oblong, obovate, elliptic or elliptic-oblong, apex obtuse, base attenuate, acute or cuneate, margin entire, glabrous, coriaceous; stipule 4-4.5 mm x 5-6 mm, interpetiolar, apex acute; petiole 5-20 mm long, stout, glabrous; lateral

nerves 6-20, pinnate, very slender; intercostae reticulate, slender. Flowers bisexual, white, fragrant, small, sessile, in terminal, long peduncle, bracteate, paniced cyme; peduncles and pedicels puberulus. Calyx tube minute, 4 toothed, membranous. Corolla tube 6 mm long, slender, lobes 4, oblong, recurved. Stamens 4, attached to the mouth of corolla tube; anthers sagitate. Ovary 2-celled, inferior, ovules one in each cell; style filiform; stigma bifid. Fruit berry, red-purple, 5 mm across, globose, glabrous; pyrenes planoconvex.

Crossway, *KVB 31532*

Fl. & Fr.: January-May

Distribution: Fairly common in Evergreen forests of Crossway and plantations of Kariyenkappu. Endemic to Western Ghats.

Ixora coccinea L., Sp. Pl. 110. 1753; Hook. f., Fl. Brit. India 3: 145. 1880; Gamble, Fl. Pres. Madras 631(445). 1921; Manilal & Sivar., Fl. Calicut 147. 1982; Ansari, Fl. Kasaragod Div. 195. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 220. 1988; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 83.1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 421. 2009.

Bushy shrubs, spreading by root sprouts. Leaves simple, opposite, 6-10 x 2.5-3 cm, elliptic to oblong, shortly acute at apex, round to slightly cordate at base, sessile, greenish on drying. Corymbs 5-8 cm across; peduncle and pedicels short. Calyx tube 0.18-0.2 cm long, puberulous without; lobes minute. Corolla scarlet; tube 3-3.5 cm long, puberulous without; lobes 0.8-1 x 0.4-0.5 cm. Stamens attached at throat; anthers 0.3-0.35 cm long. Ovary 0.1-0.2 cm across; style 3-3.5 cm long, exserted. Berry 0.6-0.8 cm diam., didymous; seeds 2, globose, 0.3-0.4 cm diam.

Kariyenkappu, *KJD 25579*

Fl. & Fr.: Throughout the year

Distribution: Grown as ornamental plant in earlier settlements.

Ixora elongata Heyne ex G. Don, Gen. Hist. 3: 571. 1834; Hook. f., Fl. Brit. India 3: 141. 1880; Gamble, Fl. Pres. Madras 630(445). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 220. 1988; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 147.1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 422. 2009.

Large shrubs, young shoots glabrous. Leaves simple, opposite, 12-15 x 3-6 cm, elliptic-oblong or oblanceolate, acute at both ends, chartaceous, glabrous, lateral nerves 12-15 pairs; petiole 1.5 cm long. Flowers in densely congested corymbs, peduncle to 15 cm long, sparsely pubescent. Calyx tube and lobes pubescent, lobes lanceolate. Corolla tube 1 cm long, lobes reflexed.

Meenmutty Road *KVB 31513*; Kattikari, *KJD 31876*

Fl. & Fr.: October-February

Distribution: Fairly common in Evergreen forests of Meenmutty and Kattikari; Plantations of Kariyenkappu. Endemic to India.

Ixora malabarica (Dennst.) Mabb., Taxon 26: 539. 1977; Manilal & Sivar., Fl. Calicut 146. 1982; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 144.1989; Sunil & Sivadasan, Fl. Alappuzha Dist. 356. 2009. *Chiococca malabarica* Dennst., Schluss. Hort. Malab. 12, 19 & 37. 1818.

Slender erect shrubs. Leaves simple, opposite, 4-13 x 2-4.5 cm, lanceolate, apex acute to shortly acuminate, base broadly acute to rounded, thin-coriaceous; stipules 5-6 mm long, triangular with subulate tip. Cymes

corymbiform, flacid, few-flowered. Bracts and bracteoles 2-2.5 mm long, subulate. Calyx campanulate; lobes 3-3.5 mm long. Corolla greenish yellow; tube 1.6-2 cm long; lobes 4-5 mm long, lanceolate, curled and recurved. Stamens attached between corolla lobes at throat of tube. Berry 1 cm across, subglobose.

Valayamchal, *KJD 25560*

Fl. & Fr.: October-March

Distribution: Rare in Semi-Evergreen forests of Valayamchal and Plantations of Kariyenkappu. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Ixora nigricans R. Br. ex Wight & Arn., Prodr. 428.1834; Hook. f., Fl. Brit. India 3: 148. 1880; Gamble, Fl. Pres. Madras 631(445). 1921; Ansari, Fl. Kasaragod Div. 195. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 221. 1988; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 111.1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 423. 2009.

Shrubs, glabrous. Leaves simple, opposite, 13 x 4 cm, elliptic to oblanceolate, long-acuminate, attenuate at base; nerves 8-10 pairs, reticulate; petiole 1 cm long; stipule 7 mm long, ovate, acuminate. Cymes 10 cm across; peduncles 4-6 cm long. Flowers pedicelled, many. Calyx 2.5 mm long, lobes 1.5 mm long, acuminate. Corolla tube 11 mm long, slender; lobes 5 x 2 mm, ovate, acute. Style 16 mm long..

Poathanplavu, *KVB 31331*; Meenmutty, *KVB 31300*

Fl. & Fr.: December-March

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Kattikari and Chavachi; Semi-evergreen forests of Paripode and Poathanplavu.

Ixora polyantha Wight, Ic. t. 1066. 1846; Hook. f., Fl. Brit. India 3: 140. 1880; Gamble, Fl. Pres. Madras 629(444). 1921; Ansari, Fl. Kasaragod Div. 196. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 222. 1988; Tariq Husain & Paul, J. Econ. Tax. Bot. Addl. ser. 5, 137.1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 424. 2009.

Stout undershrubs. Leaves simple, opposite, 10-20 by 5-8 cm, obovate to broadly oblanceolate, apex shortly acuminate, base cuneate, thin-coriaceous; lateral nerves 10-15 pairs; petiole 4-8 mm long. Cymes dense, shortly peduncled, 6-8 cm in diameter. Flowers numerous in trichasia, sessile; bracts 5-8 mm long, ovate, acute. Calyx densely hairy, lobes elliptic-lanceolate to oblong-lanceolate, ca 6 mm long, much longer than the ovary. Corolla white, tube 2.5-3 cm long, lobes narrowly obovate, obtuse or rounded, glabrous. Berry globose, c. 15 mm diam.

Chavachi, *KVB 31325*

Fl. & Fr.: February-May

Distribution: Common in Semi-evergreen forests of Poathanplavu; Evergreen forests of Meenmutty, Chavachi and Moonamthode; Plantations of Kariyenkappu. Endemic to Western Ghats.

Ixora sivarajiana Pradeep, Nordic J. Bot. 17:315. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 424. 2009.

Small trees 5-8 m tall, stem solid, terete, glabrous with prominent leaf scars. Leaves in whorls of 3 or 4, crowded towards the apices of branchlets,

narrowly elliptic-obovate or oblong, 9-16 x 2.5-6 cm, narrowed at base, acute, shortly mucronate, glabrous, coriaceous, margins entire; lateral nerves 12-15 pairs, conspicuous beneath, joining in loops towards margins; stipules broadly ovate, 7-9 x 4-5 mm, long acuminate at apex, glabrous, basal part often persistent; petiole 1-3 cm long, glabrous. Inflorescence a dense pendant, corymbose trichotomously branched branchiate dichasial cyme; peduncle 10-15 cm long, deep pink, usually with a whorl of reduced, subsessile, glabrous, floral leaves near the base, 1.5-5.5 x 0.6-2.5 cm, bracts linear-lanceolate, 2-3 mm long, glabrous above, sparsely pubescent internally towards base. Flowers tetramerous, 6-8 mm in diameter, carmine-pink, sessile or pedicellate, bracteolate; pedicel to 2 mm long, hispid; bracteoles 1.5-2 mm long, linear, minutely hairy. Calyx tube 1 mm long, sepals lanceolate, 1.5 mm long, glabrous or sparsely pubescent with few scattered simple hairs externally and at the throat within. Corolla-lobes 4, oblong, flat and spreading at first, later margins recurved, 4-5 x 3-4 mm, rounded at apex. Stamens 4, attached to the throat by a short filament, filament 1 mm long, glabrous; anthers dorsifixed, yellow, elliptic, 2 mm long. Ovary ellipsoid, 1 mm long, 2-celled with one ovule in each cell, pubescent; stigma bifid, each lobe 1.25 mm long, rounded at apex, glabrous; style 12 mm long, exerted 2 mm beyond the tube, glabrous. Fruit depressed globose, 10-12 mm in diameter, dark purple with short persistent calyx teeth at apex; seeds 2, hemispherical, 7 x 7 mm, glabrous.

Ambalappara, *KVB 31745; KJD 26324, 26333*

Fl. & Fr.: December-May

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Southern Western Ghats of Kerala.

KNOXIA L., Sp. Pl. 104. 1753.

Knoxia wightiana Wall. ex Wight & Arn., Prodr. 440. 1834; Hook. f., Fl. Brit. India 3: 129. 1880; Gamble, Fl. Pres. Madras 622(439). 1921; Bhattacharjee & Deb, Journ. Econ. Tax. Bot. 6: 81. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 223. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 425. 2009.

Glabrous woody herbs. Leaves simple, opposite, 6 x 1 cm, linear-lanceolate, curved, folded, glabrous, sessile; stipules ovate, 6 mm long, acute with few glandular teeth. Cymes 5-6 cm across, peduncled. Flowers 5 mm long, sessile. Calyx 1.5 mm long, lobes obtuse. Corolla-tube densely villous within. Style 4 mm long. Capsule 2.5 x 2.5 mm; mericarps compressed, glabrous.

Ambalappara, *KVB 31354, 31760*

Fl. & Fr.: November-March

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Peninsular India.

LASIANTHUS W. Jack., Trans. Linn. Soc. London 14: 125. 1823 *nom. cons.*

1a. Cymes sessile; leaf margin ciliate..... *L. jackianus*
 1b. Cymes peduncled; leaf margin not ciliate..... *L. capitulatus*

Lasianthus capitulatus Wight, Calcutta J. Nat. Hist. 6: 511. 1846; Hook. f., Fl. Brit. India 3: 191. 1880; Gamble, Fl. Pres. Madras 648(457). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 223. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 426. 2009. *Litosanthes capitulata* (Wight) Deb & Gangop., Candollea 44: 213. 1989.

Large shrubs; young branches softly pubescent. Leaves simple, opposite, 4-12 x 2.5-4 cm, oblanceolate, acute at both ends, glabrous above, sparsely pubescent beneath; petiole 3-5 mm long; stipules 2-7 mm broad, acuminate. Flowers white, in axillary, 2-4 mm long peduncled, pubescent cymes. Calyx 2-3 mm long; lobes 3, each 2-3 mm long, ovate, obtuse at apex, often recurved. Corolla-tube 5-6 mm long, glabrous; lobes 3, each up to 5 x 4 mm, ovate, obtuse at apex, hairy. Stamens 3, each 1-2 mm long, inserted on the throat of the corolla-tube; anthers up to 2 mm long. Ovary 4-locular with solitary ovule in each locule; style up to 5 mm long with 4 stigmatic lobes.

Ambalappara, *KJD 25515; KVB 31624, 31719*

Fl. & Fr.: February-April

Distribution: Common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Endangered.

Lasianthus jackianus Wight, Calcutta J. Nat. Hist. 6: 502. 1846; Hook. f., Fl. Brit. India 3: 180. 1880; Gamble, Fl. Pres. Madras 646(456). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 224. 1988; Deb & Gangop., Journ. Econ. Tax. Bot. 15: 286. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 427. 2009.

Shrubs 1-3 m high; branchlets hirsute, quadrangular when young, become terete with age. Leaves simple, opposite, 11-19 x 2-5 cm, oblong, elliptic-oblong, or ovate-oblong, acuminate or caudate-acuminate at apex, unequally-rounded or subacute at base, thin coriaceous, hirsute, blackish green or pale brown when dry; midrib slender channelled above; lateral nerves 6-8 pairs, opposite or subopposite, subparallel, arcuate, channelled, inconspicuous above; nervules parallel, forked, branched, inconspicuous above; petiole subsessile or 0.8 mm long, stout, hirsute; stipules 4-6 x 2-4 cm, ovate, acute at apex, coriaceous, sparsely hirsute above, few colleters present at base beneath. Cymes axillary, sessile, 2-5 flowered; bracts foliaceous, 15-50 x 4-10 mm, ovate, ovate-lanceolate, acuminate at apex, rounded at base, thin coriaceous, hirsute; midrib slender; lateral nerves 2-4 pairs, slender; bracteoles 4-8 mm long, linear, subulate or linear-lanceolate, hirsute, persistent. Flowers 6-7 mm long, sessile. Hypanthium 1 mm long, obovoid, tomentose. Calyx tomentose, tube \pm 0.5 x 0.5 mm; lobes 4, ovate-elliptic, acute. Corolla tube 3.5-4.5 mm long, glabrous above, puberulous beneath at throat; lobes 4, 2 mm long, ovate-elliptic, tomentose above, puberulous beneath. Stamens 4, subexserted; filaments 0.5 mm long thin, adnate at throat; anthers oblong. Ovary 0.5 mm long, obovoid, 4-loculed; style 3.4 mm long, flattened, wider above; stigma 4-lobed; lobes \pm 0.5 mm long, linear-oblong, papillose. Fruits 5-6 x 4-5 mm, globose, 4-ridged and grooved, crowned with persistent calyx lobes; pericarp thin, puberulous; stalk \pm 0.5 mm long, tomentose; pyrenes 4, unequal in size, wrinkled, dorsally convex, ventrally angled; raphides present; seeds 3 mm long, oblong, acute at both ends, dorsally horned, ventrally concave.

Kattikari, *KJD 31889; KVB 31543*

Fl. & Fr.: November-March

Distribution: Common in Evergreen forests of Kattikari, Chavachi and Mullenpara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

MITRACARPUS Zucc., in Schultes, Mant. 3: 210. 1827.

Mitracarpus hirtus (L.) DC., Prodr. 4: 572. 1830; Ansari, Fl. Kasaragod Div. 196. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 224. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 428. 2009. *Spermacoce hirta* L., Sp. Pl. ed. 2: 148. 1762. *Mitracarpus villosus* (Sw.) DC., Prodr. 4: 572. 1830; Sasidh.,

Fl. Parambikulam WLS 153. 2002. *Spermacoce villosa* Sw., Prodr. 29. 1788. *Mitracarpus verticillatus* (Schum. & Thonn.) Vatke, Linnaea 40: 196. 1876; Manilal & Sivar., Fl. Calicut 134. 1982; Manilal, Fl. Silent Valley 136. 1988.

Erect pubescent herbs. Leaves simple, opposite, 2-4 x 1.5-2 cm, ovate or ovate-lanceolate, base obtuse, apex acute, membranous, sessile; stipule pectinate. Flowers white, verticillate in axillary fascicles, 4-merous; bracteoles filiform. Calyx-tube small, unequally 4-lobed, larger 2 lobes 1 mm long. Corolla 1.5 mm long, funnel-shaped; lobes 4. Stamens 4, attached at throat. Ovary 2-locular, ovule 1-per locule. Capsule 1 mm long, ovoid, dehiscence circumscissile; seeds 2, minute.

Ambalappara, *KJD 26151*; Asthipara *KJD 26156*; Chavachi, *KVB 31401*

Fl. & Fr.: July-December

Distribution: Common in Evergreen forests of Ambalappara, Chavchi and Asthipara.

MITRAGYNA Korth., Observ. Naucleis Ind. 19: 1839, *nom. cons.*

Mitragyna tubulosa (Arn.) Hav., J. Linn. Soc. Bot. 33: 71. 1897; Gamble, Fl. Pres. Madras 585(413). 1921; Manilal & Sivar., Fl. Calicut 133. 1982; Ansari, Fl. Kasaragod Div. 197. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 429. 2009. *Nauclea tubulosa* Arn. in Thw., Enum. Pl. Zeyl. 137. 1859. *Stephegyne tubulosa* (Arn.) Hook.f. ex Bedd., Fl. Sylv. t.29. f.1. 1869; Hook. f., Fl. Brit. India 3: 25. 1880.

Deciduous trees, to 15 m high, bark 20-25 mm thick, greyish-green, smooth; branches horizontal. Leaves simple, opposite, decussate, 10-20 x 3.5-12.5 cm, ovate, elliptic, elliptic-ovate or ovate-oblong, apex acute to acuminate, base truncate, obtuse or attenuate, margin entire, glabrous, coriaceous; stipules 8 mm long, interpetiolar, 0.8 cm long, oblong, obtuse; petiole 10-30 mm long, slender, glabrous; lateral nerves 7-12 pairs, pinnate, slender, prominent beneath; intercostae scalariform, very slender; domatia absent. Flower bisexual, purplish-pink, 10-12 mm long, in terminal heads; bracts 2, leafy, on the peduncle; receptacle hirsute; bracteoles many, paleaceous, ciliate on margin. Calyx tube truncate, elongate, obconic, glabrous. Corolla tube funnel shaped, lobes 5, reflexed. Stamens 5, attached at the throat of corolla tube, filaments short; anthers oblong, apiculate. Ovary 2-celled, inferior, ovules many; style filiform; stigma mitriform, hollow at base. Fruit a capsule, ovoid, ribbed, yellowish-brown, in globose heads ca. 2 cm across; seeds many, minute, winged.

Chavachi, *KJD 26353*

Fl. & Fr.: April-May

Distribution: Rare in Evergreen forests of Chavachi. Endemic to Peninsular India.

MUSSAENDA L., Sp. Pl. 177. 1753.

Mussaenda frondosa L., Syst. Nat. (ed.10) 2: 931.1759; Hook. f., Fl. Brit. India 3: 89. 1880; Gamble, Fl. Pres. Madras 610(430). 1921; Manilal & Sivar., Fl. Calicut 145. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 430. 2009. *Mussaenda belilla* Buch.-Ham., Trans. Linn. Soc. London 14: 203. 1824; Ansari, Fl. Kasaragod Div. 198. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 225. 1988. *Mussaenda laxa* (Hook. f.) Hutch. ex Gamble, Fl. Pres. Madras 610(430). 1921; Sasidh. et al., Bot. Stud. Med. Pl. Kerala 12.1996. *Mussaenda frondosa* L. var. *laxa* Hook. f., Fl. Brit. India 3: 89. 1880.

Straggling shrubs; branchlets pubescent. Leaves simple, opposite, 6-10 x 4-6 cm, broadly ovate, caudate acuminate at apex, base rounded, sparsely hairy on both surfaces; petiole to 1.5 cm long; stipules 3-4 mm long, ovate, bifid at apex. Cymes terminal, lax, tomentose. Flowers 5-merous. Bracts and bracteoles linear, 1-1.5 cm, hairy. Calyx-lobes 5, 0.8-1 cm long, lanceolate, hairy, one of the calyx lobes transformed into a showy, white, pubescent, leaf-like structure, 8-12 x c. 4.5 cm. Corolla 2.5-3 cm long, funnel-shaped dilated above middle, orange-red or yellow, tomentose outside, villous at mouth; lobes 6-7 mm long, ovate-lanceolate. Stamens 5, included or exserted. Berry c. 1 cm across, globose.

Kariyenkappu, KVB 31443

Fl. & Fr.: September-March

Distribution: Common in Plantations of Kariyenkappu, Semi-evergreen forests of Narikkadvu, Kurukathode and Paripode. Endemic to Peninsular India.

MYCETIA Reinw., Syll. Pl. Nov. II : 9. 1828.

Mycetia acuminata (Wight) O. Ktze., Rev. Gen. Pl. 1: 289. 1891; Gamble, Fl. Pres. Madras 612(431). 1921; Anil Kumar et al., Fl. Pathanamthitta 258. 2005. *Lawia acuminata* Wight, Ic. t. 1070. 1846. *Adenosacme lawii* Hook. f., Fl. Brit. India 3: 96. 1880.

Erect fleshy herbs. Leaves simple, opposite, 27 x 10 cm, elliptic-oblong, acuminate at apex; nerves to 20 pairs, prominent, parallel; petiole 5-8 cm long, stipule 12 mm long, ovate, acute, membranous. Cymes 5-7 cm across, axillary, peduncled. Flowers 6 mm long, pedicelled. Calyx 6 mm long, lobes 5, acuminate. Corolla blue, spreading, tube short, lobes 5, ovate, spreading. Stamens adnate to the corolla tube, anthers linear. Ovules many on peltate placenta; style short; stigmas linear. Berry, 8 mm across, white, fleshy; seeds many, angular.

Meenmutty, KJD 26357

Fl. & Fr.: August-January

Distribution: Rare in Evergreen forests of Meenmutty and Kattikari. Endemic to Western Ghats; Conservation status: Vulnerable.

NEANOTIS W. H. Lewis, Ann. Missouri Bot. Gard. 53: 34. 1966.

1a. Capsule dehiscent septically; flowers pedicelled..... *N. monosperma*

1b. Capsule dehiscent loculicidally; flowers sub sessile *N. decipiens*

Neanotis decipiens (Hook. f.) Lewis, Ann. Miss. Bot. Gard. 53: 37. 1966; Anil Kumar et al., Fl. Pathanamthitta 259. 2005. *Anotis decipiens* Hook. f., Fl. Brit. India 3: 72. 1880; Gamble, Fl. Pres. Madras 604(426). 1921.

Procumbent herbs, rooting at lower nodes; stems glabrous. Leaves simple, opposite, ovate, acuminate, sparsely villous; nerves 7-9 pairs; petiole 3 cm long, hairy. Cymes 3-5 cm across, terminal; branches glabrous, slender. Flowers 5-6 mm long, blue or pink, subsessile. Calyx lobes ovate, ciliate. Corolla tube slender, shortly villous inside, lobes ovate, villous.

Mullenpara, KJD 25436

Fl. & Fr.: October-December

Distribution: Fairly common in Evergreen forests of Mullenpara, Ambalappara and Pothurumi. Endemic to Western Ghats.

Neanotis monosperma (Wall. ex Wight & Arn.) Lewis, Ann. Miss. Bot. Gard. 53: 39. 1966; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 431. 2009. *Hedyotis monosperma* Wall. ex Wight & Arn., Prodr. 410. 1834. *Anotis monosperma* (Wall. ex Wight & Arn.) Hook. f., Fl. Brit. India 3: 75. 1880; Gamble, Fl. Pres. Madras 605(427). 1921.

Prostrate, sparsely strigose herbs; internodes to 4.5(6) cm. Leaves simple, opposite, ovate, to 2.5 x 1.7 cm, apex acute, base truncate to attenuate; petiole to 1.5 cm; stipules 3 mm. Cymes corymbose, lax, 3 x 1.5 cm; peduncles of 1 order to 2 cm; those of 2nd order to 0.5 cm; pedicel to 1.5 cm. Calyx-lobes 4, lanceolate, margin strigose. Corolla white, 3 mm wide; tube 2 mm; lobes 4, strigose at apex. Stamens 4. Capsules 2 mm wide, glabrous, dehiscence septicial; seeds 2 or 3 per cell.

Mullenpara, *KJD 31936*

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to Peninsular India.

NEOLAMARCKIA Bosser, *Adansonia* Ser. 4, 6: 247. 1984.

Neolamarckia cadamba (Roxb.) Bosser, *Adansonia* ser. 4. 6: 247. 1984; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 227. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 432. 2009. *Nauclea cadamba* Roxb., *Fl. Ind.* 2: 121. 1824. *Anthocephalus chinensis* sensu A. Rich. ex Walp., *Rep.* 2: 491. 1843, non *Cephalanthus chinensis* Lam. 1785; Manilal & Sivar., *Fl. Calicut* 133. 1982; Mohanan, *Fl. Quilon Dist.* 204. 1984. *Anthocephalus cadamba* (Roxb.) Miq., *Fl. Ind. Bat.* 2: 135. 1850; Hook. f., *Fl. Brit. India* 3: 23. 1880. *Anthocephalus indicus* A. Rich., *Mem. Rubiac.* 157. 1830; Gamble, *Fl. Pres. Madras* 583(411). 1921.

Deciduous trees, to 20 m high, bark 6-8 mm, pale brown, vertically shallowly grooved, exfoliating in small rectangular flakes; branches horizontal. Leaves simple, opposite, decussate, 10-25 x 6-12 cm, ovate or elliptic-oblong, apex acuminate, base truncate or obtuse, margin entire, glabrous above, pubescent beneath; stipules interpetiolar, lanceolate, cauducous; petiole 20-45 mm, stout, glabrous; lateral nerves 10-14 pairs, pinnate, prominent; intercostae scalariform, prominent. Flowers bisexual, yellowish, in globose heads, 2-4.5 cm across. Calyx tube 2-3 mm in diameter, tube globose, lobes 5, 5-6 x 3-4 mm, membranous. Corolla tube 6-8 mm long, lobes 5, oblong, acute, 3-4 cm long, glabrous. Stamens 5, 3 mm long, anthers sagittate, sessile. Ovary 3-4 mm long, 2-celled at base, 4-celled above, inferior, ovules many; style exerted to 5-6 mm, entire; stigma clavate. Fruit a capsule on a fleshy globose receptacle, 3.5-5 cm across, orange yellow, capsule membranous; seeds may, angular, minute.

Chavachi, *KVB 31433*

Fl. & Fr.: April-August

Distribution: Fairly common in Evergreen forests of Chavachi and Chelachode near streams.

NEUROCALYX Hook., *Icon. Pl.* 2: 174. 1837.

Neurocalyx calycinus (R. Br. ex Bennett) Robins., *Proc. Amer. Acad. Arts* 45:402. 1910; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 228. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 432. 2009. *Argostemma calycinum* R. Br. ex Bennett, *Pl. Jav. Rar.* 97. 1838. *Neurocalyx wightii* Arn., *Ann. Nat. Hist. ser.* 1. 3: 22. 1839; Hook. f., *Fl. Brit. India* 3: 47. 1880; Gamble, *Fl. Pres. Madras* 591(417). 1921.

Large herbs, pubescent. Leaves simple, whorled at tip, 26 x 7 cm, oblanceolate, acute at apex, rusty puberulus; nerves to 18 pairs, prominent below; stipule 2 cm long, obovate, 2-fid at apex. Racemes 10-13 cm long,

axillary, rarely branched; bracts lanceolate. Flowers white, pedicelled. Calyx tube hemispherical, lobes 5, 8 x 5 mm, ovate. Corolla tube absent, lobes 5 x 3 mm, ovate, twisted. Stamens 5, anthers connate into a conical tube. Ovary 2-celled, ovules many, style slender. Capsule irregularly bursting, 4 x 4 mm; seeds many, pitted.

Kattikari, KVB 31562

Fl. & Fr.: February-August

Distribution: Fairly common in Evergreen forests of Kattikari and Chavachi.

OCHREINAUCLEA Ridsdale, Blumea 24: 332.1978.

Ochreinauclea missionis (Wall. ex G. Don) Ridsd., Blumea 24: 332. 1978; Ansari, Fl. Kasaragod Div. 200. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 433. 2009. *Nauclea missionis* Wall. ex G. Don, Gen. Hist. 3: 467. 1834; Hook. f., Fl. Brit. India 3: 27. 1880; Gamble, Fl. Pres. Madras 582(411). 1921. *Sarcocephalus missionis* (Wall. ex G. Don) Havil, J. Linn. Soc. Bot. 33: 32. 1897.

Evergreen trees, to 12 m high, bark greyish-brown, shallowly irregularly grooved; young shoots glabrous. Leaves simple, opposite, decussate, 8-14 x 3.5-6 cm, elliptic, elliptic-obovate or elliptic-oblong, apex acute or obtuse, base attenuate or decurrent, margin entire, glabrous, membranous to chartaceous; stipules 4-10 x 2-5 mm, oblong, obtuse, semi persistent, glabrous; petiole 5-15 mm long, stout, glabrous; lateral nerves 10-13 pairs, pinnate, regular, prominent beneath, intercostae reticulate, slender. Flowers bisexual, yellowish-white, 5-6 mm long, in terminal 2.5-3 cm diameter heads, hypanthia mutually connate at apex. Calyx tube short; lobes 4-5, 2-3 mm long, oblong to trigonal-oblong, pubescent below. Corolla infundibular, 8-10 mm long, greenish-yellow; lobes 4-5, 2-3 mm long, pubescent outside. Stamens 4-5, attached to the throat of corolla; filaments short; anthers 1 mm long, basifixed, introrse, conspicuously protruding from the throat. Ovary 2-locular, inferior; placenta attached to the middle of the septum, heart shaped; ovules many; style 7-10 mm, exserted; stigma spindle shaped. Fruit a drupe, globose, fleshy; seeds ovoid, few in each cell.

Valayamchal, KJD 26262

Fl. & Fr.: May-November

Distribution: Fairly common in Semi-evergreen forests of Valayamchal, near River banks. Endemic to southern Western Ghats; Conservation status: Vulnerable.

OLDENLANDIA L., Sp. Pl.: 119.1753.

- 1a. Flowers axillary, solitary or binate *O. herbacea*
1b. Flowers in axillary corymb..... *O. corymbosa*

Oldenlandia corymbosa L., Sp. Pl. 119.1753; Hook. f., Fl. Brit. India 3: 64. 1880,p.p.; Gamble, Fl. Pres. Madras 600(423). 1921; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 434. 2009. *Hedyotis corymbosa* (L.) Lam., Encycl. 1: 272. 1792; Manilal & Sivar., Fl. Calicut 142. 1982; Ansari, Fl. Kasaragod Div. 192. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 216. 1988; Dutta & Deb, Taxonomic Revision Hedyotis 149. 2004.

Diffuse or spreading prostrate herbs; stem 4-angled. Leaves simple, opposite, 1-2.5 x 0.2-0.4 cm, linear-lanceolate, acute at apex, base attenuate, scabrid on margins; stipules sheathing. Flowers 2-6 in a corymb; 4-merous; peduncles 4-8 mm long. Calyx tube c. 1 mm long, lobes minute. Corolla white;

tube c. 1 mm long with a ring of hairs at throat. Stamens 4 inserted at corolla base. Capsules c. 2 mm across, subglobose, loculicidal, dehiscent at top only; seeds minute, trigonous.

Narikadvu, *KJD 26265*

Fl. & Fr.: April-September

Distribution: Along the boundaries of forests.

Oldenlandia herbacea (L.) Roxb., Fl. Ind. 1: 495. 1820; Gamble, Fl. Pres. Madras 601(424). 1921; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 435. 2009. *Hedyotis herbacea* L., Sp. Pl. 102. 1753; Manilal & Sivar., Fl. Calicut 141. 1982; Ansari, Fl. Kasaragod Div. 192. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 217. 1988; Dutt & Deb, Taxonomic Revision Hedyotis 120. 2004. *Oldenlandia heynei* R. Br. ex G. Don, Gen. Hist. 3: 531. 1834; Hook. f., Fl. Brit. India 3: 65. 1880. *Hedyotis heynei* R. Br. ex Wight & Arn., Prodr. 416. 1834.

Much branched, erect herbs; stem 4-angled, narrowly winged along angles. Leaves simple, opposite, sessile, 1.5-3 x 0.1-0.3 cm, linear-lanceolate, acute at apex, glabrous; stipules short, 3-4-setose on margins. Flowers solitary or 2-nate, axillary; peduncles filiform, 0.5-1 cm long. Calyx tube turbinate, to 2 mm, funnel-shaped; lobes triangular-subulate. Corolla white, 1-1.5 mm long, wider on mouth; lobes 5, minute. Stamens 4, included, subsessile. Stigma 2-fid. Capsule c. 2.5 mm across, subglobose, didymous, loculicidal; seeds minute, trigonous.

Ambalappara *KVB 31753*; Kariyenkappu *KJD 25496*

Fl. & Fr.: July-December

Distribution: Fairly common near water bodies of Kariyenkappu and Ambalappara.

OPHIORRHIZA L., Sp. Pl. 150. 1753.

- 1a. Mature inflorescence above 8 cm long, lax cymes *O. barberi*
1b. Mature inflorescence below 5 cm long..... 2
2a. Capsules hairy *O. sp.*
2b. Capsules not so 3
3a. Bracteoles very short and deciduous..... *O. rugosa*
3b. Bracteoles linear and persistent *O. hirsutula*

Ophiorrhiza barberi Gamble, Bull. Misc. Inform. Kew 1919: 406. 1919 & Gamble, Fl. Pres. Madras 607(428). 1921; Deb & Mondal, Bull. Bot. Surv. India 39: 26. 1997; Mohanan & Sivadas., Fl. Agasthyamala 341. 2002.

Undershrubs. Leaves simple, opposite, 4-10 x 2-3.5 cm, lanceolate to ovate lanceolate, acuminate at apex, round to broadly attenuate at base; petiole 5mm long. Cymes terminal, and axillary to upper leaves. Calyx tube 0.1-0.15 cm long; lobes c. 0.1 cm long. Corolla white; tube 0.4-0.5 cm long; lobes 5, 0.1-0.15 cm long, glabrous or sparsely hairy without. Ovary 0.05-0.1 cm long, crowned by disc. Capsule 0.2-0.25 x 0.35-0.4 cm.

Meenmutty *KJD 26182*; Chavachi *KJD 26094*; Mullenpara *KJD 26170*

Fl. & Fr.: May-September

Distribution: Fairly common in Evergreen forests of Meenmutty, Chavachi, Moonamthode, Mullenpara and Asthipara. Endemic to southern Western Ghats; Conservation status: Endangered.

Ophiorrhiza hirsutula Wight ex Hook. f., Fl. Brit. India 3: 81. 1880; Gamble, Fl. Pres. Madras 608(429). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 229. 1988; Deb & Mondal, Bull. Bot. Surv. India 39: 57. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 437. 2009.

Undershrubs; stem, peduncles, calyx and capsules rusty pubescent. Leaves simple, opposite, 3-8 x 1.5-3 cm, ovate-lanceolate, acute to shortly acuminate at apex, round to broadly attenuate at base; petioles 0.8-2.5 cm long; stipules broadly ovate, caudately acuminate at apex, pubescent. Cymes terminal, 1.5-2.5 cm diam; bracteoles 4-5 mm long, filiform. Calyx tube ca 1 mm long; lobes minute. Corolla white; tube 4-5 mm long. Ovary ca 1 mm long. Capsule 15-.20 mm long, 3-4mm wide.

Ambalappara, *KJD 26155*

Fl. & Fr.: March-November

Distribution: Rare in Evergreen forests of Ambalappara and Asthippara.

Ophiorrhiza rugosa Wall.

1a. Decumbent herb, below nodes rooted..... var. *decumbens*

1b. Erect herbs, nodes not rooted var. *prostrata*

Ophiorrhiza rugosa Wall. **var. decumbens** (Gard. ex Thw.) Deb & Mondal, Bull. Bot. Surv. India 24: 228. 1982; Deb & Mondal, Bull. Bot. Surv. India 39: 111. 1997. *Ophiorrhiza decumbens* Gard. ex Thw., Enum. Pl. Zeyl. 419. 1864. *Ophiorrhiza harrisiana* Heyne var. *decumbens* (Gard. ex Thw.) Hook. f., Fl. Brit. India 3: 78. 1880.

Herbs, 7-30 cm long; stem decumbent, branching, puberulous. Leaves simple, opposite, 2-8 x 1-2 cm, elliptic, or narrow elliptic, obtuse or acute at apex, narrowed at base, glabrous above, brownish green beneath; lateral nerves 6-9 on either side; petioles 0.5-1.5 cm long, puberulous; stipules 0.5-0.7 cm long, triangular, 1-2-toothed. Inflorescence 1-1.5 cm across; peduncles 2.5-4 cm long, puberulous. Flowers 5-7 mm long; pedicels 0.7-mm long, puberulous. Hypanthium 0.8-1 x 0.6-0.8 mm. Calyx lobes 0.75-1 x 0.4-0.6 mm. Corolla 4.2-6 mm long, infundibuliform, puberulous outside, villous at the middle within; lobes 1.25-1.5 x 0.75-1 mm. Filaments 0.8-1.25 mm long; anthers 1-1.25 mm long. Ovary 0.7-0.9 x 0.5-0.75 mm; disc 0.25-0.5 mm high; style 3-5 mm long, glabrous; stigma 2-lobbed, 0.75-1 mm long, lobes lanceolate. Capsule 2-2.5 x 4-4.5 mm, glabrous; seeds 0.2-0.3 x 0.25 mm, glabrous, brown.

Kariyenkappu, *KJD 26109*

Fl. & Fr.: February-October

Distribution: Rare in plantations of Kariyenkappu near streams.

Ophiorrhiza rugosa Wall. **var. prostrata** (D. Don) Deb & Mondal, Bull. Bot. Surv. India 24: 228. 1982; Ansari, Fl. Kasaragod Div. 201. 1985; Deb & Mondal, Bull. Bot. Surv. India 39: 114. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 438. 2009. *Ophiorrhiza prostrata* D. Don, Prodr. Fl. Nepal. 136. 1825; Ramach. & V.J. Nair, Fl. Cannanore Dist. 229. 1988. *Ophiorrhiza harrisonii* G. Don, Gen. Hist. 3: 523. 1834. *Ophiorrhiza harrisiana* Heyne ex G. Don, Gen. Hist. 3: 523. 1834; Hook. f., Fl. Brit. India 3: 78. 1880; Gamble, Fl. Pres. Madras 607(428). 1921.

Procumbent herbs. Leaves ovate, obtusely acute at apex, rounded at base, pubescent along the nerves below, chartaceous; nerves 4-6 pairs; petiole 1-2

cm long; stipule triangular, hairy. Cymes 1-2 cm across, congested; peduncle 5 cm long. Flowers minute, white. calyx 1 mm long, lobes ovate. corolla 3 mm long, white. Capsule 2.5 mm across, compressed; seeds 3-5, rugose, folded.

Chavachi, KVB 31418

Fl. & Fr.: June-October

Distribution: Fairly common in Evergreen forests.

Ophiorrhiza sp.

Annual herbs, up to 30 cm height, hairy. Leaves opposite, 6-15 x 2.5-4 cm, ovate, elliptic to lanceolate, acute to acuminate, base cuneate, sparsely hairy above, puberulous below, margin entire; lateral nerves 10-15, prominent; stipules filiform, 3 mm long, persistent. Inflorescence corymbose cymes, peduncles 2.5-3 cm long, elongating in fruit, slender; flowers white, hairy. Calyx lobes 5, ovate-lanceolate, acute. Corolla white, 5 lobed, 5-10 mm long, infundibuliform, lobes ovate, acute; Stamens 5, adnate to the lower portion of corolla, anthers linear oblong. Ovary obovoid, stigma 2-lobbed. Capsules 1.5-3 x 4-6 mm, puberulous.

Ambalappara, KJD 26133

Fl. & Fr.: June-October

Distribution: Boundaries of Grasslands at Ambalappara.

This species is closely allied to *O. chandrasekharanii* by the pubescent nature, shape of flowers, pubescent capsules etc. The novelty is to be confirmed by comparing the type specimen of *O. chandrasekharanii*.

PAVETTA L., Sp. Pl. 110. 1753.

- 1a. Undersurface of leaves densely pubescent *P. brunonis*
- 1b. Undersurface glabrous or nearly so 2
- 2a. Inflorescence a compact corymb; corolla less than 1cm long *P. breviflora*
- 2b. Inflorescence loosely arranged; corolla more than 1.5 cm long *P. indica*

Pavetta breviflora DC., Prodr. 4: 491. 1830; Hook. f., Fl. Brit. India 3: 151. 1880, p.p.; Gamble, Fl. Pres. Madras 633(447). 1921; Rout & Deb, Bull. Bot. Surv. India 41: 75. 1999. *Pavetta brevifolia* DC. var. *subcoriacea* Gamble, Fl. Pres. Madras 634(447). 1921; Sebastine & Vivek., Bull. Bot. Surv. India 9: 174. 1967.

Shrubs or small trees; stem stout, subquadrangular, glabrous; bark yellowish. Leaves simple, opposite, 5.5-13.0 x 1.6-5.5 cm, elliptic or elliptic-obovate, acute at apex and base, subcoriaceous, glabrous; domatia few to many on secondary or tertiary nerves; lateral nerves 9-12 pairs, alternate or subopposite, more prominent beneath; petioles 0.5-1.5 cm, stout, glabrous; stipules interpetiolar, 7-10 x 3-4 mm, narrowly triangular, subcoriaceous, scarious at margin. Inflorescence terminal, peduncled, trichotomously branched, corymbose cymes, 4-6 cm across. Flowers 40-50; bracts 8-11 x 5-6 mm, broadly triangular, membranous, glabrous pedicels 1.5-3.0 mm, glabrous. Hypanthium ca 1 x 1 mm, obovoid; Calyx tube ca 1.0 x 1.8 mm, broader above, glabrous; teeth 0.4-0.5 x 0.2 mm, narrowly triangular or dentate, glabrous; Corolla tube ca 8 mm long, ca 1.5 mm across, cylindrical, glabrous; lobes ca 5.0 x 2.5 mm, oblong, mucronulate at apex, glabrous. Staminal filaments ca 0.8 mm, glabrous; anthers 4.5-5.0 mm, glabrous. Ovary ca 0.8 x 1.0 mm, disc ca 0.5 x 1.0 mm; style ca 14 mm long, stout, glabrous;

stigma ca 3 mm, fusiform, glabrous. Drupe 6-7 mm across, globose or subglobose, glabrous, 1 seeded; seeds ca 4 mm.

Kannadivechakunnu, *KJD 25569*; Pothurumi, *KVB 31734*

Fl. & Fr.: March-December

Distribution: Rare in Evergreen forests of Kannadivechakunnu, Chavachi and Pothurumi. Endemic to southern Western Ghats.

Pavetta brunonis G. Don, Gen. Hist. 3: 575. 1834; Hook. f., Fl. Brit. India 3: 152. 1880; Gamble, Fl. Pres. Madras 634 (447). 1921; Rout & Deb, Bull. Bot. Surv. India 41: 82. 1999; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 440. 2009. *Ixora nilagirica* O. Ktze., Rev. Gen. Pl. 1: 286. 1891.

Shrubs, 2-3 m high, erect, branched; stem stout, 4-angled, glabrous and corky in age, pubescent when young. Leaves simple, opposite, 5.5-17.0 x 2.5-7.5 cm, elliptic-obovate, acute or acuminate at apex, cuneate, acute or attenuated at base, membranous, glabrescent or sparsely pubescent above, densely pubescent beneath; midrib canaliculate and pubescent above, tomentose beneath; lateral nerves 10-12 pair, pubescent; stipules persistent, interpetiolar, 12-17 x 5-7 mm, oblong-triangular, acute at apex, subcoriaceous, pubescent outside. Inflorescence terminal, sessile or peduncled, trichotomously branched, corymbose cymes, 7-8 cm across, pubescent; peduncles up to 1 cm long, pubescent; bracts 6-7 x 5 mm, cuspidate, membranous, pubescent outside, glabrous within. Flowers ca 100; pedicels 2-4 mm, pubescent. Hypanthium ca 1 x 1 mm, obovoid, pubescent. Calyx tube ca 0.5 x 1.0 mm, broader above, pubescent outside, glabrous within; teeth 1.5-2.0 x 0.3 mm, subulate, acute at apex pubescent outside, glabrous within. Corolla tube 9-12 mm long, ca 1 mm across, cylindrical, glabrous outside, pilose within; lobes 4.5-5.0 x 2.5 mm, oblong, mucronulate at apex, glabrous. Staminal filaments 0.2-0.5 mm, slender, glabrous; anthers 3.5-4.5 mm. Ovary ca 0.8 x 0.8 mm; disc ca 0.5 x 0.8 mm; style 20-25 mm long, slender, glabrous, puberulous below stigma; stigma ca 2 mm, simple, fusiform, puberulous. Drupes 7-10 x 7-11 mm, subglobose or didymous, sparsely pubescent, with persistent calyx teeth; seeds 1 or 2, ca 4 mm.

Pothurumi, *KVB 31379*; Pothanplavu, *KVB 31389*

Fl. & Fr.: April-June

Distribution: Fairly common in Evergreen forests of Pothurumi and Chavachi; Semi-evergreen forests of Paripode. Endemic to southern Western Ghats.

Pavetta indica L., Sp. Pl. 110. 1753, **var. indica**; Hook. f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Pres. Madras 633(446). 1921; Manilal & Sivar., Fl. Calicut 146. 1982; Ansari, Fl. Kasaragod Div. 202. 1985; Rout & Deb, Bull. Bot. Surv. India 41: 118. 1999; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 440. 2009.

Shrubs; branchlets glabrescent. Leaves simple, opposite, 7-11 x 3-4 cm, ovate-elliptic or oblanceolate, apex acuminate, base acute-attenuate, chartaceous, glabrous; petiole to 1.8 cm long. Corymb terminal. Calyx minutely 4-toothed, to 3 mm long. Corolla white; tube c. 1.5 cm long, slender, sparsely pilose within; lobes obovate. Stamens 4, between the lobes, exserted; anthers linear-oblong. Ovule solitary; style slender, exserted; stigma fusiform. Berry 6-9 mm across, globose, black when ripe.

Pothanplavu, *KVB 31337*; Pothurumi, *31424*

Fl. & Fr.: April-July

Distribution: Fairly common in Semi-evergreen forests of Pothanplavu and Evergreen forests of Chavachi and Pothurumi.

PSILANTHUS Hook.f. in Hooker's Icon. Pl. 12: t. 1129. 1873.

Psilanthus travancorensis (Wight & Arn.) Leroy, Compt. Rend. Hebd. Seances Acad. Sci. 29, D:595. 1980; Sivar., Biju & Mathew, Bot. Bull. Acad. Sinica 33: 219. 1992; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 443. 2009. *Coffea travancorensis* Wight & Arn., Prodr. 433. 1834; Hook. f., Fl. Brit. India 3: 154. 1880; Gamble, Fl. Pres. Madras 637(449). 1921.

Shrubs, to 1.5-2.5 m tall. Leaves simple, opposite, variable in size and shape, to 12 x 6 cm, broadly ovate, elliptic or oblanceolate, entire, acute or shortly acuminate at apex, acute or cuneate at base, coriaceous, glabrous, shining green above, paler beneath; lateral nerves 5-8 pairs, faint above, raised below, without domatia; petiole 1-3 mm, glabrous; stipules ovate, shortly acuminate at tip, 1.5-2 mm long, glabrous outside and with colleters at base within. Inflorescence 1-5 flowered, mostly on terminal. Flowers white, fragrant, the central flower in 3-5 flowered inflorescence usually ebracteate and ebracteolate, others with one pair of bracts and a pair of closely set bracteoles; bracts ovate-cuspidate, to 1-1.6 mm long, glabrous outside; bracteoles lanceolate, to 2 mm long. Calyx cup-shaped, to 1.2 mm long, glabrous, much shorter than the disc, limb subentire. Corolla glabrous, tube cylindric, 10-18 mm long, lobes 5, elliptic-obtuse, 8-12 x 3-7 mm. Stamens 5, inserted below the throat; anthers sessile, 5-7 mm long, tips exerted. Ovary stipitate, style 1.2 mm, glabrous; stigma 2-lobed, lobes acute, 1-1.4 mm. Fruits blue-black when ripe, depressed globose, didymous, 14 x 20 mm; seeds dark, ellipsoid, 5-7 x 4-5 mm, with a prominent ventral groove.

Kariyenkappu, *KJD 26294*

Fl. & Fr.: October-December

Distribution: Near people settled areas, rare, maybe grown earlier.

PSYCHOTRIA L., Syst. Nat. ed. 10, 929. 1364. 1759, *nom. cons.*

- 1a. Seeds without ridges and furrows, albumen ruminant 2
- 1b. Seeds with ridges and furrows, albumen uniform..... 5
- 2a. Branches of inflorescence opposite *P. flavida*
- 2b. Branches of inflorescence whorled 3
- 3a. Bracteoles persistent..... *P. dalzellii*
- 3b. Bracteoles deciduous or absent 4
- 4a. Calyx 5-toothed; fruit ovoid-ellipsoid.....*P. nigra*
- 4b. Calyx entire or minutely toothed; fruit ellipsoid..... *P. macrocarpa*
- 5a. Seeds ventrally flat and dorsally 1-ridged..... *P. bisulcata*
- 5b. Seeds ventrally grooved, dorsally without ridges..... *P. sp.*

Psychotria bisulcata Wight & Arn., Prodr. 434.1834; Hook. f., Fl. Brit. India 3:171.1880; Gamble, Fl. Pres. Madras 641(452). 1921; Deb & Gangop., J. Econ. Tax. Bot. Addl. ser. 7, 116. 1989; Mohanan & Sivad., Fl. Agasthyamala 352. 2002.

Subshrubs. Leaves simple, opposite, 11 x 4.5 cm, elliptic, abruptly acuminate, cuneate at base, membranous; nerves 7 or 8 pairs, prominent below, reticulate; petiole 1 cm long; stipule 7 mm long, ovate, cuspidate, densely rufous-villous within. Cymes 3-4 cm across, villous at nodes. Flowers 4 mm long, sessile. Calyx 1.5 mm long, truncate, glabrous. Corolla tube 2.5

mm long densely villous inside, lobes acute, deflexed. Style 1.5 mm long, broaden up.

Mullenpara, *KJD 26163, 31932*

Fl. & Fr.: March-July

Distribution: Fairly common in Evergreen forests of Mullenpara, Kattikari and Meenmutty.

Psychotria dalzellii Hook. f., Fl. Brit. India 3: 163. 1880; Gamble, Fl. Pres. Madras 640(451). 1921; Ansari, Fl. Kasaragod Div. 202. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 232. 1988; Deb & Gangop., J. Econ. Tax. Bot. Addl. ser. 7, 68. 1989.

Shrubs or small trees, 4.5-6 m high; branchlets stout, smooth, glabrous. Leaves simple, opposite, 7-25 x 4-10 cm, obovate, oblanceolate, obovate-oblong, obtuse, rounded or apiculate at apex, cuneate at base, coriaceous glabrous, pale green; midrib conspicuous, channeled above; lateral nerves 12-20 on either side, arcuate, without domatia; nervules conspicuous; petiole 0.5-2 cm long, glabrous; stipules 15-20 x 8-15 mm, ovate, oblong or orbicular, acute or acuminate at apex, coriaceous, glabrous above, villous at base beneath. Inflorescence terminal, brachiate paniculate cymes, 4.5-10 cm across; primary branches 4-5 at a whorl, subtended by 4-5 large bracts; secondary branches 3 or 4-5 at a whorl, subtended by 2 bracts; heads 4-8 mm across; peduncles 2-7cm long, glabrous; bracts persistent, 5-10 x 5-6 mm, ovate, oblong or suborbicular, glabrous above, rarely ciliate at margin; bracteoles persistent, various, 3-3.5 x 2-2.5 mm, concave, involucrate, ciliate at margin not folded. Flowers 8-10 mm long; pedicels 0-0.5 mm long, glabrous. Hypanthium 0.7-1 mm long, oblong, glabrous. Calyx broadly campanulate, 4-5 x 3-4 mm, coriaceous, glabrous, lobes 5, 0.6-1 mm long, oblong, rounded, turbinate, truncate, or emarginate at apex, ciliate or glabrous at margin. Corolla tube 3-4.5 mm long, glabrous above, villous at throat within; lobes 5, 2-3 mm long, oblong or ovate-oblong, slightly inflexed, sometimes incurved at margin. Stamens 5, exserted or inserted; filaments 0.2-0.6 mm in long. Anthers 0.8-1 mm long, oblong. Ovary 0.5 mm long; style 4-5 mm long, narrow, glabrous; stigma 2-lobed, 0.4-0.6 mm long, ovate, papillose. Fruits sessile, 10-13 x 5-7 mm, obovoid or subglobose, crowned with persistent calyx lobes, rugose, succulent, reticulate or glabrous at surface; mesocarp thick; pyrenes 2, rarely 1 immature, obovoid, obtuse or truncate at apex, acuminate at base, plano-convex or semiterete, dorsally sharp ridges, ventrally usually flat, rarely convex, albumen ruminant.

Narikadvu, *KJD 26199*

Fl. & Fr.: March-November

Distribution: Fairly common in Semi-evergreen forests of Narikadvu. Endemic to Western Ghats.

Psychotria flavida Talbot, Trees & Shrubs Bombay 113. 1894; Gamble, Fl. Pres. Madras 641(452). 1921; Ansari, Fl. Kasaragod Div. 203. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 232. 1988; Deb & Gangop., J. Econ. Tax. Bot. Addl. ser. 7, 89. 1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 443. 2009.

Small shrubs; branchlets terete, glabrous. Leaves simple, opposite, 10-18 x 3.5-8 cm, elliptic-oblong or obovate, acute at apex, attenuate at base, glabrous, yellowish green on drying; lateral nerves 9-12 pairs; petiole to 2.5

cm long; stipules 6-8 mm long, ovate, acute at apex, deciduous. Flowers in terminal corymbose cymes; bracteoles 5-7 mm long, lanceolate. Calyx tube 2-2.5 mm, campanulate, 5-toothed. Corolla white; tube c. 2 mm long, funnel-shaped, hairy at throat; lobes 5, oblong, acute. Stamens 5; anthers ovate. Stigma 2-lamellate. Fruit c. 5 mm across, globose, bluish-purple; fruiting peduncle and pedicels yellow; seeds 1-2, planoconvex.

Kattikari, *KVB 31546*

Fl. & Fr.: April-October

Distribution: Common in Evergreen forests of Kattikari, Chelachode, and Chavachi; Plantations of Kariyenkappu. Endemic to southern Western Ghats.

Psychotria macrocarpa Hook. f., Fl. Brit. India 3: 162. 1880; Gamble, Fl. Pres. Madras 641(452). 1921; Deb & Gangop., J. Econ. Tax. Bot. Addl. ser. 7, 54. 1989; Anil Kumar et al., Fl. Pathanamthitta 265. 2005.

Shrubs, to 2 m tall. Leaves simple, opposite, 14-17 x 5-7 cm, obovate, abruptly acuminate, tip obtuse, cuneate at base; nerves 8-10 pairs, 2 cm apart; petiole to 3 cm. Panicle 4 x 10 cm, branches whorled, spreading, hirtus. Flowers 3-5-together. Calyx truncate, glabrous. Stamens included, connectives of anthers glandular. Style 4 mm long, bifid at apex. Fruit 7 x 7 mm, globose, smooth.

Mullenpara State Boundary, *KJD 26053*

Fl. & Fr.: November-March

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to southern Western Ghats.

Psychotria nigra (Gaertn.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.): 152. 1931, **var. nigra**; Deb & Gangop., J. Econ. Tax. Bot. Addl. ser. 7, 49. 1989; Ramach. & V.J. Nair, Fl. Cannanore Dist. 232. 1988. *Grumilea nigra* Gaertn., Fruct. 1: 138. t.28. 1788. *Psychotria thwaitesii* Hook. f., Fl. Brit. India 3: 162. 1880, p.p; Gamble, Fl. Pres. Madras 640(451). 1921.

Large shrubs, 2-3 m tall. Leaves simple, opposite, 19 x 8.5 cm, obovate, obtuse, broadly apiculate, nerves to 16 pairs, regular, 8-10 mm apart, domatia glandular; stipule 12 mm long, ovate, strongly mucronate. Cymes 1-1.5 cm across, 3-6-together, globose, densely fulvous hairy; peduncle 2-3 cm long, stout. Flowers many, densely packed, 5 mm long. Calyx 1.5 mm long, campanulate, 5-toothed, ciliate. Corolla white, 3 mm long, tube hairy at mouth, lobes reflexed. Drupe 6 mm across, subglobose, pyrenes smooth.

Chavachi, *KVB 31519, 31583*; Pothanplavu *31328*

Fl. & Fr.: March-October

Distribution: Fairly common in Semi-evergreen forests of Pothanplavu and Evergreen forests of Chavachi.

Psychotria sp.

Shrubs 2-3 m height. Leaves opposite to sub opposite, 6-12 X 2-4 cm, ovate-elliptic rarely narrow elliptic, glabrous, brownish when dry, acute, base cuneate, margin entire; petiolate; lateral nerves 6-12, subopposite to opposite; stipules not persistent. Flowers on cymes. Fruits stalked, drupe, ellipsoid, 9-15 x 2-3 mm, pyrenes plano convex, embryo T-shaped.

Narikadvu, *KJD 26193*

Fl. & Fr.: May-July

Distribution: Rare in Semi-evergreen forests of Narikadvu.

It is closely allied to *P. nudiflora* var *nudiflora* by its type of infrutescence, leaf nerves etc. but differs in the elliptic-acuminate leaves and ellipsoid fruits. In *P. nudiflora* var. *nudiflora* the leaves are obovate with acute-mucronate apex and the fruit is globose.

PSYDRAX Gaertn., Fruct. Sem. Pl. 1: 125. 1788.

- 1a. Flowers in compact umbels *P. umbellata*
1b. Flowers in axillary cymes *P. dicoccos*

Psydrax dicoccos Gaertn., Fruct. 1: 125. t.26. f.2. 1788, **var. dicoccos**; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 446. 2009. *Canthium didymum* (Brandis) Hook.f., Fl. Brit. India 3: 132. 1880, non Gaertn. f. 1806. *Plectronia didyma* Benth. & Hook. f. ex Brandis, For. Fl. 276.1874; Gamble, Fl. Pres. Madras 624(440). 1921. *Canthium dicoccum* (Gaertn.) Merr., Philipp. J. Sci. 35: 8. 1928.

Evergreen trees, to 12 m high, bark white, corky. Leaves simple, opposite, distichous, 7-12 x 2.4-4.5 cm, elliptic, elliptic-lanceolate, ovate or ovate-lanceolate, apex acuminate, base cuneate or acute, margin entire, recurved, glabrous, shiny coriaceous; stipules interpetiolar, cuneate, triangular, cuspidate; petiole 4-10 mm, stout, glabrous; lateral nerves 2-4 pairs, pinnate, prominent, ascending; intercostae reticulate, obscure beneath, domatia present. Flowers bisexual, pentamerous in axillary cymes, 10 mm long. Calyx tube short, lobes ciliate. Corolla lobes 5, oblong, reflexed, tube densely villous. Stamens 5; filaments short, disc round, cushion like. Ovary 2-celled, inferior; ovules one in each cell, pendulous; style 14 mm long, glabrous. Fruit a drupe, 0.8 cm long, globose, compressed, glabrous; pyrene rugose.

Ambalappara, KVB 31575, 31636

Fl. & Fr.: February-May

Distribution: Fairly common in Evergreen forests of Ambalappara and Mullenpara.

Psydrax umbellata (Wight) Bridson, Kew Bull. 48: 762. 1993; Sasidh., Fl. Parambikulam WLS 161. 2002. *Canthium umbellatum* Wight, Ic. t. 1034. 1845; Hook. f., Fl. Brit. India 3: 132. 1880. *Plectronia didyma* (Gaertn. f.) Kurz var. *umbellata* (Wight) Gamble, Fl. Pres. Madras 624(440). 1921. *Canthium dicoccum* (Gaertn.) Teijsm. & Binn. var. *umbellatum* (Wight) Sant. & Merch., Bull. Bot. Surv. India 3: 107. 1961; Ramach. & V.J. Nair, Fl. Cannanore Dist. 212. 1988.

Evergreen trees, bark yellowish-grey, shallowly fissured; branchlets tetragonous. Leaves simple, opposite decussate, 8-15 x 3-6 cm, elliptic, lanceolate, elliptic-oblong, elliptic-obovate, oblong-lanceolate, ovate or ovate-lanceolate, apex acuminate, caudate-acuminate or obtusely acuminate, base acute or attenuate, margin entire, glabrous, coriaceous; stipules interpetiolar, connate; petiole 6-10 mm, stout, glabrous; lateral nerves 3-6 pairs, pinnate, slender, faint; intercostae reticulate, faint. Flowers bisexual, white, in axillary, compact umbels; peduncle 5 mm long, stout. Calyx tube short, 5-toothed. Corolla tube campanulate; lobes 5, valvate, reflexed. Anthers 5, subsessile on the mouth of the corolla. Ovary inferior, 2-celled, ovules one in each cell; style columnar; stigma capitate. Fruit a drupe, 1.2 cm long, ovoid, black; pyrenes 1-2.

Mullenpara state Boundary, KJD 26070

Fl. & Fr.: February-August

Distribution: Fairly common in Evergreen forests of Mullenpara.

RUBIA L., Sp. Pl. 109. 1753.

Rubia cordifolia L., Syst. Nat. (ed.12) 3: 229. 1768; Hook. f., Fl. Brit. India 3: 202. 1880; Gamble, Fl. Pres. Madras 655(462). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 234. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 446. 2009.

Scabrous climber, stem 4-angled, articulate. Leaves whorled, 4 in each node, equal or unequal, to 7 x 3 cm, ovate, acuminate at apex, cordate at base, 3-5-ribbed from base; petiole 2-5 cm long. Flowers 3 mm across; in axillary dichotomous cymes. Calyx tube turbinate, lobes 4, minute. Corolla lobes ovate, valvate, spreading, white. Anthers globose. Ovules solitary in each cell, styles 2, stigmas capitate. Fruit fleshy, globose, purple 4-5 mm across.

Ambalappara, KVB 31381

Fl. & Fr.: November-December

Distribution: Rare in Grasslands of Ambalappara.

SAPROSMA Blume, Bijdr. 956. 1826.

1a. Leaves sessile; flowers terminal, sessile..... *S. glomeratum*

1b. Leaves petiolate; flowers pedicelled *S. fragrans*

Saprosma fragrans Bedd., For. Man, Bot. 134/11. 1872; Hook. f., Fl. Brit. India 3: 193. 1880; Gamble, Fl. Pres. Madras 649(458). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 234. 1988; Gangop., Journ. Econ. Tax. Bot. 15: 86. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 447. 2009. *Serissa fragrans* Bedd., Ic. t. 14. 1868-1874.

Shubs 3-4 m high; branchlets dichotomous, compressed when young, terete in age, glabrous, smooth or rough. Leaves simple, opposite, 4-14 x 2-4 cm, elliptic oblong, long acuminate at apex, slightly unequally acute at base, entire margin incurved, thin, membranous, glabrous, green or pale when dry; midvein slender, channelled above, terete beneath; lateral nerves 5-6 on either side, subopposite, arcuate, slender, domatia present at axils; nervules reticulate, inconspicuous; petioles 2-5 mm long, very slender; stipules 2-3 x 2-2.5 mm, ovate-oblong, 2 or 3-toothed, teeth long acuminate, connate, glabrous above, bristly at base within. Inflorescence axillary or terminal cymes, few flowered, trichotomous; bracts, bracteoles minute, ovate lanceolate. Flowers infundibuliform, 8-10 mm long, fragrant, white; pedicels up to 1 mm long, slender, glabrous. Corolla tube 5-6 mm long, wider above, glabrous, lobes 2-2.5 mm long, ovate, minutely inflexed at apex, glabrous above, pubescent beneath. Disc ca 1 mm across, ovoid, smooth. Stamens included; filaments minute, adnate below throat; anthers ovate-oblong. Ovary ca 0.5 mm long; styles 2-3 mm long, filiform, glabrous, lobes ca 0.5 mm long, spreading, ovate, acute as apex, glabrous. Drupes short stalked, ca 6 x 5 mm, ovoid, pericarp thin, glabrous; seed solitary, ellipsoid.

Kattikari, KJD 31487

Fl. & Fr.: June-April

Distribution: Fairly common in Evergreen forests of Kattikari, Moonamkallu and Chavachi. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Saprosma glomeratum (Gard.) Bedd., For. Man. Bot. 134/11. 1872; Ramach. & V.J. Nair, Fl. Cannanore Dist. 235. 1988; Gangop., Journ. Econ. Tax. Bot. 15: 86. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 447. 2009. *Dysodidendron*

glomeratum Gard., Calcutta J. Nat. Hist. 7: 3. 1847. *Saprosma indicum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 37. 1851; Hook. f., Fl. Brit. India 3: 192. 1880; Gamble, Fl. Pres. Madras 649(457). 1921. *Serissa glomerata* (Gard.) Bedd., Ic. t.16. 1868-1874.

Shrubs, to 1.5 m tall. Leaves simple, opposite, 12 x 5 cm, ovate-oblong, acute, subcordate at base; domatia glandular; nerves 10-15 pairs; sessile or subsessile. Flowers 3-6 together, in terminal clusters, 7 mm long, shortly pedicelled. Calyx 2 mm long, lobes 4, ovate, acute. Corolla white, densely hairy within. Anthers sessile. Berry 1 cm across, globose, emarginate, deep blue; seed 1, globose or ellipsoid.

Kattikari, KJD 22591

Fl. & Fr.: October-July

Distribution: Rare in Evergreen forests of Kattikari. Endemic to Western Ghats.

SPERMACOCE L., Sp. Pl. 102. 1753.

Spermacoce ocymoides Burm.f., Fl. Ind. 34 & 13. f.1. 1768; Hook. f., Fl. Brit. India 3: 200. 1881; Deb & Dutta, Journ. Econ. Tax. Bot. 5: 1052. 1984; Sivar. et al., Proc. Indian Acad. Sci. (Plant. Sci.) 97:356.1987; Ramach. & V.J. Nair, Fl. Cannanore Dist. 236. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 450. 2009. *Borreria ocymoides* (Burm.f.) DC., Prodr. 4: 544. 1830; Gamble, Fl. Pres. Madras 654(461). 1921; Manilal & Sivar., Fl. Calicut 136. 1982. *Borreria ocymoides* var. *thekkumalensis* Sivar. & Joseph, New Botanist 6:133. 1979.

Pubescent, erect herbs. Leaves simple, decussate, 3.5 x 1.5 cm, sparsely scabrous, elliptic-oblong, apex acute, base cuneate to attenuate, (sub)sessile; stipules 1 x 0.8 cm; nerves 3 or 4 pairs. Flowers 40-50 per node. Calyx truncate, strigose without; lobes 4, unequal, linear-lanceolate, 2 short and 2 long. Corolla white, 2 mm wide; tube 2 mm, glabrous within; lobes 4. Stamens 4. Capsule truncate, 1.5 x 1 mm, dehiscent transversely.

Crossway, KJD 22521

Fl. & Fr.: November-July

Distribution: Common in Plantations of Kariyenkappu and Evergreen forests of Crossway.

TARENNA Gaertn., Fruct. 1: 139. 1788.

- 1a. Corolla tube shorter than corolla lobes *T. alpestris*
1b. Corolla tube equal or longer than corolla lobes..... 2
2a. Cymes and corolla tube glabrous *T. canarica*
2b. Cymes and corolla tube pubescent *T. nilagirica*

Tarenna alpestris (Wight) Balakr., Bull. Bot. Surv. India 22: 175. 1980 (1982); Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 451. 2009. *Coffea alpestris* Wight, Ic. t. 1040. 1845. *Coffea grumelioides* Wight, Ic. t. 1041. 1845. *Webera leucens* Hook.f., Fl. Brit. India 3: 106. 1880. *Stylcoryne leucens* (Hook.f.) Gamble, Fl. Pres. Madras 635(448). 1921.

Shrubs to small trees. Leaves simple, opposite, to 9 x 2 cm, elliptic or oblanceolate, acute, base cuneate. Flowers white, 1.5 cm long, in terminal corymbose cymes. Calyx glabrous, 5-toothed. Corolla lobes equal to the tube. Style hairy, stigma fusiform. Berry ovoid.

Ambalappara, KVB 31641; KJD 31945

Fl. & Fr.: November-December

Distribution: Common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Tarennia canarica (Bedd.) Bremek., Feddes Repert. 37:208. 1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 237. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 452. 2009. *Pavetta canarica* Bedd., For. Man. Bot. 134/8. 1872. *Webera canarica* (Bedd.) Hook.f., Fl. Brit. India 3: 106. 1880. *Stylocoryne canarica* (Bedd.) Gamble, Fl. Pres. Madras 635(448). 1921; Anil Kumar et al., Fl. Pathanamthitta 270. 2005.

Shrubs. Leaves simple, opposite, 8-24 x 2-7 cm, narrowly attenuate at base; nerves 10-12, 1-1.5 cm apart. Flowers in lax terminal corymbs; bracts 0.15-0.25 cm long, subulate. Calyx tube 0.15-0.2 cm long. Corolla lobes 1-1.2 cm long, 0.4-0.6 cm wide, lanceolate. Berry subglobose, 1-1.2 cm diam., black on drying; seeds 2, subglobose, 0.5-0.8 cm diam.

Chavachi, KVB 31377

Fl. & Fr.: November-June

Distribution: Fairly common in Evergreen forests of Chavachi. Endemic to southern Western Ghats.

Tarennia nilagirica (Bedd.) Bremek., Feddes Repert. 37: 197. 1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 238. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 452. 2009. *Pavetta nilagirica* Bedd., For. Man. Bot. 134/8. 1872. *Webera nilagirica* (Bedd.) Hook. f., Fl. Brit. India 3: 108. 1880. *Stylocoryne nilagirica* (Bedd.) Gamble, Fl. Pres. Madras 635(448). 1921.

Shrubs, 3-4 m tall; young parts resinous. Leaves simple, opposite, 11-20 x 3.5-7.5 cm, elliptic-lanceolate, acuminate at apex, truncate at base, glabrous on both surfaces; petiole 1.2-1.6 cm long; stipules caducous. Flowers creamy-white, 4-5 cm long, in trichotomous, corymbose cymes; pedicels 4-5 mm long. Calyx-tube up to 3 mm long; lobes 5, up to 2 mm long, triangular. Corolla-tube to 1.5 cm long; lobes 5, to 1.2 cm long, oblong, obtuse. Stamens 5, inserted near the mouth of corolla; filaments very short; anthers to 1 cm long, linear. Ovary bilocular with two ovules per locule; style up to 2.1 cm long, hairy, stigma fusiform.

Ambalappara, KVB 31423

Fl. & Fr.: March-November

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

WENDLANDIA Barti. ex. DC., Prodr. 4: 411. 1830. *nom. cons.*

Wendlandia thyrsoidea (Schult.) Steud., Nomencl. Bot. (ed. 2) 2: 786. 1841; Ramach. & V.J. Nair, Fl. Cannanore Dist. 238. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 453. 2009. *Canthium thyrsoideum* Schult. in Roem. & Schult., Syst. Veg. 6: 207. 1820. *Wendlandia notoniana* Wall. ex Wight & Arn., Prodr. 403. 1834; Hook. f., Fl. Brit. India 3: 40. 1880; Gamble, Fl. Pres. Madras 588(415). 1921.

Trees, to 8 m high; branchlets terete to angular, tomentose. Leaves simple, ternate whorled, 4-15 x 1.5-7 cm, elliptic, elliptic-lanceolate or elliptic-obovate, apex acute or acuminate, base cuneate or attenuate, margin entire, tomentose beneath, glabrous above on ageing, chartaceous; stipule interpetiolar, 6 mm long, ovate, obtuse, bifid, often recurved, tomentose; petiole 4-10 mm, stout, pubescent; lateral nerves 5-12 pairs, pinnate, prominent beneath; intercostae reticulate, slender. Flowers bisexual, pale yellow, fragrant, 6 mm long, in dense terminal panicles; peduncle densely pubescent; bracts and bracteoles lanceolate. Calyx subglobose, pubescent, lobes 5, short, valvate. Corolla tube elongate, slender 2.5 mm, funnel shaped, sparsely hairy within, lobes 5, imbricate. Stamens 5, exserted; anthers oblong, subsessile. Ovary depressed

globose, 2-celled, inferior, ovules many on globose placenta; style filiform; stigma 2 fid. Fruit a capsule, globose, 2 valved; seeds small; testa membranous.

Ambalappara, *KVB 31356, 31796; KJD 26309*

Fl. & Fr.: December-April

Distribution: Common in Evergreen forests of Ambalappara.

VALERIANACEAE

VALERIANA Sp. Pl. 1: 31. 1753

Valeriana hardwickii Wall. **var. arnottiana** (Wight) Clarke in Hook.f., Fl. Brit. India 3: 213. 1880; Manilal, Fl. Silent Valley 145. 1988; Prakash, Journ. Econ. Tax. Bot. 20:246.1996. *Valeriana arnottiana* Wight, Ic. t. 1045-6. 1845; Gamble, Fl. Pres. Madras 657(463). 1921

Caulescent, erect herb; stem ribbed and hollow. Leaves cauline, decussate, pinnate, chartaceous; petiole to 4 cm; leaflets 5-9, lower ones alternate, ovate, to 6 x 4 cm, base cuneate-truncate, margin serrate-dentate, apex acuminate; petiolule to 15 mm. Cymes diffuse, 16 x 11 cm; peduncle to 15 cm; bracts to 10 mm. Calyx-limbs more than 10. Corolla white, 5 mm wide; lobes 5, broadly ovate. Stamens 3. Ovary 1-celled; ovule 1. Achene 3.5 mm.

Ambalappara, *KJD 26395*

Fl. & Fr.: June-December

Distribution: Rare at Evergreen Forests of Ambalappara.

ASTERACEAE/ COMPOSITAE

1a. Heads with similar flowers.....	2
1b. Heads with dissimilar flowers	16
2a. Leaves opposite	3
2b. Leaves alternate	8
3a. Leaves with cordate base; climbers	Mikania
3b. Leaves with out cordate base; prostrate or erect plants	4
4a. Receptacle spicate	Spilanthes
4b. Receptacle not spicate	5
5a. Pappus 2-3, bristle like	Adenostema
5b. Pappus 5-many, setaceous	6
6a. Anthers appendaged at apex	Ageratum
6b. Anthers not appendaged.....	7
7a. Outer involucral bracts pubescent; ovary glabrous.....	Ageratina
7b. Outer involucral bracts glandular; ovary scaly	Chromolaena
8a. All flowers ligulate	Launaea
8b. All flowers tubular.....	9
9a. Groups of heads supported by 3-4 spathes; leaves radical.....	Elephantopus
9b. Heads not supported by spathes; leaves cauline.....	10
10a. Bracts uniseriate.....	11
10b. Bracts 2-3 seriate.....	12
11a. Achens 10 ribbed, heads in racemes.....	Crassocephalum
11b. Achens 5 ribbed, heads corymbose	Emilia
12a. Pappus absent	Adenoon
12b. Pappus present	13
13a. Pappus in two series, outer smaller	Vernonia
13b. Pappus uniseriate similar.....	14
14a. Flowers yellow; bracts 1-2 seriate	Cissampleopsis
14b. Flowers not yellow, blue or violet; bracts many seriate.....	15
15a. Plants glabrous	Centratherum
15b. Plants hairy	Phyllocephalum

16a. Leaves opposite.....	17
16b. Leaves alternate.....	21
17a. Capitula axillary, sessile.....	Synedrella
17b. Capitula terminal or axillary, peduncled.....	18
18a. Leaves pinnately compound.....	Bidens
18b. Leaves simple, entire.....	19
19a. Pappus absent or reduced in to minute teeth.....	Eclipta
19b. Pappus developed.....	20
20a. Achenes terete, pappus many.....	Tridax
20b. Achenes 3-4 angled, pappus 3-4.....	Wedelia
21a. Anther base tailed.....	22
21b. Anther base not tailed.....	24
22a. Plants woolly, not aromatic.....	23
22b. Plants not woolly, usually aromatic.....	Blumea
23a. Dioecious flowers sterile, female flowers many.....	Anaphalis
23b. Dioecious flowers usually fertile, female flowers 1-2 rows.....	Helichrysum
24a. Anther base sagitate.....	Laggera
24b. Anthers base obtuse or entire.....	25
25a. Pappus present.....	Conyza
25b. Pappus absent.....	Dichrocephala

ADENOON Dazell, in Hook.'s J. Bot. Kew Gard. Misc. 2: 344. 1850.

Adenoon indicum Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 344. 1850; Hook. f., Fl. Brit. India 2: 229. 1881; Gamble, Fl. Pres. Madras 668(470). 1921; Uniyal in Hajra et al., Fl. India 13: 331.1995; Sivar. & Mathew, Fl. Nilambur 357. 1997.

Herbs, erect; stems terete, spreading hairy, angled. Leaves simple, 8.5 x 4.5 cm, obovate-elliptic-rhomboid, margins irregularly serrate, serrations ending in mucro, thick, hairy on both the surfaces, prominently nerved beneath. Heads pedunculate, bracteate at the forks and below the heads; bracts linear-lanceolate, almost awned at the tip. Involucral bracts many-seriate, glandular-hairy on the back, aristate; outer elliptic, ovate-lanceolate, ca 5.5 mm long; inner oblong-elliptic, ca 8.5 mm long, ciliate on the margins in the upper half, thinner, distinctly nerved. Achenes ca 2.5 mm long, 10-ribbed, glandular between the ribs; pappus absent.

Ambalappara, NS & KJD 25510

Fl. & Fr.: September-December

Distribution: Rare in Grasslands of Ambalappara. Endemic to Penninsular India

ADENOSTEMMA J. R. Forst. & G. Forst., Charact. Gen. 89, t. 45. 1776.

Adenostemma lavenia (L.) O. Ktze., Rev. Gen. Pl. 1:304. 1891; Gamble, Fl. Pres. Madras 677(476). 1921; Ansari, Fl. Kasaragod Div. 207. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 241. 1988; Uniyal in Hajra et al., Fl. India 12: 346. 1995. *Verbesina lavenia* L., Sp. Pl. 902. 1753. *Adenostemma latifolium* D. Don, Prodr. Fl. Nepal. 181. 1825. *Adenostemma viscosum* J.R. & G. Forst., Char. Gen. 90. t. 45. 1776. *Adenostemma viscosum* J.R. & G. Forst. var. *lavenia* Hook. f., Fl. Brit. India 3: 242. 1881, p.p.

Erect annual branched herbs to 60 cm tall. Leaves simple, variable, lower opposite and upper often alternate, 15 x 7 cm, oblong or oblong-lanceolate, subacute, base cuneate, coarsely serrate; 3-nerved from base; petiole to 1.5 cm long. Heads in few to many in panicles, 6-7 mm across; bract linear. Involucral phyllaries linear-oblong, obtuse or subacute, glabrous. Corolla tube short, glandular hairy and viscous, lobes 5, acute. Style twice the length of the

corolla, much exserted. Achenes 4-5 mm long, 5-angled, obtuse, nearly smooth; pappus of 4 or 5 glandular setae.

Mullenpara, NS & KJD 31933

Fl. & Fr.: October-December

Distribution: Fairly common in Evergreen forests of Mullenpara and Kattikkari

AGERANTIA Spach., Hist. Nat. Veg. Phan. 10. 286. 1841.

Ageratina adenophora (Spreng.) King & Robins., Phytologia 19: 211.1970; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 457. 2009. *Eupatorium adenophorum* Spreng., Syst. Veg. 3: 420. 1826; Uniyal in Hajra et al., Fl. India 12: 350. 1995. *Eupatorium glandulosum* Kunth, Nov. Gen. Sp. 4: 122, t. 346. 1820, non Michx. 1803.

Subshrubs, glandular hairy, stem violet-blue. Leaves simple, opposite, 5-8 x 2-4 cm, ovate, apex acute, serrate; petiole 2 cm long. Heads 7 mm across, 5 mm long, packed, in terminal corymbose panicle; bracts 3-seriate, 4 x 1 mm, lanceolate, strongly 3-ribbed. Outer florets bisexual. Corolla white, 5-lobed, hispid. Inner florets female. Achenes 2 mm long, curved, ellipsoid, 5-angled, brown, smooth; pappus 5-10, 4 mm long, white, barbed.

Meenmutty, KVB 31275; Ambalappa NS & KVB 31341, 31711

Fl. & Fr.: February-June

Distribution: Common weed in Evergreen forests of Ambalappa, Kattikkari, Mullenpara and Meenmutty.

AGERATUM L., Sp. Pl. 839. 1753.

Ageratum conyzoides L., Sp. Pl. 839. 1753; Clarke, Comp. Ind. 30. 1876; Hook. f., Fl. Brit. India 3: 243. 1881; Gamble, Fl. Pres. Madras 677(476). 1921; Manilal & Sivar., Fl. Calicut 151. 1982; Ansari, Fl. Kasaragod Div. 208. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 241. 1988; Uniyal in Hajra et al., Fl. India 12: 348. 1995; Sasidh. et al., Bot. Stud. Med. Pl. Kerala 9, 21, 29; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 457. 2009.

Herbs, viscid hairy. Leaves simple, opposite, 5-7 x 3-5 cm, ovate, apex acute, crenate, base rounded; petiole 1-3 cm long. Heads white, to 7 mm across, in terminal corymbose panicle; bracts 1-3-seriate, 3-4 mm long, elliptic, toothed at apex, 3-ribbed. Flowers all similar, bisexual. Corolla 2.5 mm long, tubular, white, glabrous, 5-lobed at apex. Stamens 5, anthers linear. Achenes 2 mm long, linear, 5-angled, hirsute along the angles; pappus 3-4 mm long, many, setaceous.

Kariyenkappu, KJD 22592

Fl. & Fr.: August-December

Distribution: Common throughout the forest as weed.

ANAPHALIS A. P. de Candolle, Prodr. 6: 271. 1837.

- 1a. Vegetative and reproductive leafy shoots originate from a Perennial root stock *A. neelgerryana*
- 1b. No root stock present 2
- 2a. Leaves scattered all over the stem, flowers yellow *A. leptophylla*
- 2b. Leaves congested at lower half of the stem, flowers red 3
- 3a. Leaves margin flat, base slightly decurrent *A. subdecurrens*
- 3b. Leaves margin recurved towards base *A. aristata*

Anaphalis aristata DC., Prodr. 6: 274. 1838; Hook. f., Fl. Brit. India 3: 285. 1881; Gamble, Fl. Pres. Madras 696(489). 1921; P.C. Pant in Hajra et al., Fl. India 13: 55. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 458. 2009.

Slender annual herbs; younger stems cottony wooly. Leaves simple, 2-4 x 0.3 cm, acuminate at apex, narrowed from a broad amplexicaule or cordate base, 1-nerved, scabrous above. Heads 3 x 3 mm, hemispherical, collected in terminal dense clusters; bracts 4 mm long, spreading, elliptic, acute, wooly, solid at base. Bisexual flowers central, 5 or 6. Corolla 2.5 mm long, broader above. Female flowers many. Corolla 1.5 mm long, slender. Achenes cylindrical, brown, papillose; pappus 2 mm long, white.

Ambalappara, *KJD 25467*

Fl. & Fr.: July-April

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Peninsular India.

Anaphalis leptophylla (DC.) DC., Prodr. 6: 273. 1838; Hook. f., Fl. Brit. India 3: 285. 1881; Gamble, Fl. Pres. Madras 696(490). 1921; P.C. Pant in Hajra et al., Fl. India 13: 67. 1995; Mohanan & Sivad., Fl. Agasthyamala 368. 2002. *Helichrysum leptophyllum* DC. in Wight, Contrib. 20. 1834.

Slender herbs, profusely branched from base. Leaves simple, 1.5-2.5 x 0.2-0.3 cm, linear lanceolate, mucronate at tip, sparsely cottony above, densely white cottony below; midrib prominent. Heads grouped into dense corymbs. Involucre bracts many seriate, scaly, cottony without, 0.3-0.4 cm long. Corolla tube slender, 0.3 cm long, 5-lobed, pale yellow. Stamens 5; anthers sagittate at base. Achenes 0.1 cm, angled and slightly compressed, minutely white papillose; pappus of many white barbellate hairs, 0.3-0.4 cm long.

Ambalappara, *KJD 26344*; *KVB 31767*

Fl. & Fr.: June-October

Distribution: Fairly common in the Grasslands of Ambalappara. Endemic to southern Western Ghats.

Anaphalis neelgerryana (Sch.-Bip. ex DC.) DC., Prodr. 6: 272. 1838; Hook. f., Fl. Brit. India 3: 287. 1881; Gamble, Fl. Pres. Madras 697(490). 1921; P.C. Pant in Hajra et al., Fl. India 13: 69. 1995. *Gnaphalium neelgerryanum* Sch.-Bip. ex DC. in Wight, Contrib. 21. 1834.

Herbs, perennial, erect, ca 25 cm high, with woody root-stock; branches many, slender, whole plant clothed with white cottony tomentum. Leaves linear, simple, 0.2-1 x 0.1-0.3 cm, acute at apex, base rounded and adhering to stem, margins recurved, surfaces densely white woolly 1-nerved, sessile. Heads densely crowded or solitary or in corymbose clusters, ca 0.3 cm across; peduncle ca 3 mm long, densely white woolly tomentose. Involucral bracts 4-5-seriate; outermost brown, ovate-elliptic, enveloped in woolly tomentum; inner bracts glistening white with brownish or darker base, oblanceolate. Ray florets with filiform corolla, ca 1.8 mm long, obscurely toothed. Corolla of disc florets tubular, ca 2 mm long, 5 or more toothed. Achenes ca 0.4 mm long, terete, minutely papillose; pappus hairs white, minutely plumose.

Ambalappara, *KJD 25463*

Fl. & Fr.: July-March

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Anaphalis subdecurrens (DC.) Gamble, Fl. Pres. Madras 695(489). 1921; P.C. Pant in Hajra et al., Fl. India 13: 75. 1995. *Gnaphalium subdecurrens* DC. in

Wight, Contrib. 21. 1834. *Anaphalis oblonga* DC., Prodr. 6: 274. 1838; Hook. f., Fl. Brit. India 3: 283. 1881.

Erect herbs; stems densely covered with smocky wool. Leaves simple, 3-6 x 0.6-1 cm, oblanceolate, acute, 1-veined, sessile. Heads 3 x 6 mm, sessile, collected in terminal congested cymes; bracts 3 mm long, elliptic, entire, acute with solid lower portion; outer ones wooly. Female flowers many; corolla yellow, slender, glabrous. Bisexual flowers 4-6, central; corolla broader. Achenes brown, papillose; pappus 2 mm long, white.

Ambalappara, *KJD 25465*

Fl. & Fr.: July-March

Distribution: Fairly common in the Grassland of Ambalappara.

BIDENS L., Sp. Pl. 831. 1753.

Bidens pilosa L. var. **minor** (Blume) Sherff, Bot. Gaz. 80: 387. 1925; H.J. Chowdhery in Hajra et al., Fl. India 12: 373. 1995. *Bidens sundaica* var. *minor* Blume, Bijdr. 914. 1826. *Bidens pilosa* sensu Hook. f., Fl. Brit. India 3: 309. 1881; Gamble, Fl. Pres. Madras 709(499). 1921, p.p. non L. 1753.

Herbs, stem quadrangular. Leaves opposite, 12-18 cm, pinnate; lobes to 6 x 3 cm, ovate-lanceolate, apex acute, base truncate, serrate, hairy. Heads to 1 cm across; peduncles to 8 cm, flexuous involucre bracts biseriate, outer ca 3 x 1 mm, linear, spatulate, inner to 5 x 2 mm, ovate, obtuse. Rays florets 2-5. Corolla bilobed, yellow; disc many. Achenes ca 2.5 mm; setae 2-4, ca 3 mm long.

Chavachi, *KJD 26117*; Ambalappara, *KVB 26306*

Fl. & Fr.: January-October

Distribution: Fairly common in Evergreen forests of Ambalappara and Chavachi.

BLUMEA DC., Arch. Bot. 2: 514. 1883, *nom. cons.*

- 1a. Prostrate herbs *B. oxyodonta*
1b. Erect herbs or shrubs 2
2a. Leaves glabrous below *B. laevis*
2b. Leaves variously tomentose below *B. hieracifolia* var. *flexuosa*

Blumea hieracifolia (D. Don) DC. var. **flexuosa** (Clarke) Randeria, Blumea 10: 249. 1960; S. Kumar in Hajra et al., Fl. India 13: 126. 1995. *Blumea flexuosa* Clarke, Comp. Ind. 86. 1876; Gamble, Fl. Pres. Madras 688(484). 1921. *Blumea flexuosa* Clarke var. *peninsularis* Hook. f., Fl. Brit. India 3: 267. 1881.

Perennial herbs to 2 m tall; stems usually unbranched or sometimes branched at the base, somewhat flexuose, erect or decumbent, terete, villous-hirsute, densely so towards the apex. Leaves simple, alternate, 4-15 x 1-5 cm, elliptic-oblanceolate, apex acute or acuminate, attenuate and subpetiolate at the base, margin serrate-dentate, teeth indurated, pubescent on the upper surface, densely greyish cottony tomentose beneath. Heads 4-5 mm diameter, urceolate-campanulate, somewhat cernuous, in clusters of 4-12 on densely hirsute peduncles of axillary or terminal panicles. Involucre 4-seriate, phyllaries linear-lanceolate, 4-9 mm long, 0.5-1 mm broad, the outer ones at least densely hirsute, the inner ones often purplish. Flowers yellow or purple. Female corolla 4.5-5.75 mm long, glabrous; those of hermaphrodite flowers 4.5-6.0 mm long, the lobes papillate usually with a few white multicellular hairs. Receptacle c. 2.5 mm broad, glabrous. Achenes oblong, c. 1.25-1.5 mm

long, pale brown, 10-ribbed, glabrous or sparsely pubescent; pappus 4.5-5 mm long, white.

Kattikkari, *KJD 22593*

Fl. & Fr.: February-June

Distribution: Fairly common in Evergreen forests of Kattikkari.

Blumea laevis (Lour.) Merr., Trans. Amer. Philos. Soc. n.s. 24: 386. 1935. *Placus laevis* Lour., Fl. Cochich. 497. 1790. *Blumea virens* Wall. ex DC. in Wight, Contrib. 14. 1834; Hook. f., Fl. Brit. India 3: 264. 1881; Gamble, Fl. Pres. Madras 686(483). 1921; Ansari, Fl. Kasaragod Div. 210. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 245. 1988; S. Kumar in Hajra et al., Fl. India 13: 143. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 464. 2009.

Erect glabrous shrubs, 1-1.5 m high. Leaves alternate, 5-10 x 3-5 cm, pinnatisect and serrate, glabrous; petiole 1-5 cm long. Heads 5 x 7 mm, many, in axillary and terminal large panicles, peduncles 1.5 cm long, glabrous; outer bracts 2 mm long, lanceolate, hairy at apex; inner larger, 6 mm long, linear-oblong. Bisexual florets 10, central; corolla 5 mm long, glandular. Female florets many; corolla 4 mm long, slender. Achenes 2 mm long, ribbed, oblong, hairy; pappus 4 mm long, white.

Chelachode, *KVB 31684*

Fl. & Fr.: December-June

Distribution: Fairly common in Evergreen forests of Kattikkari and Chelachode.

Blumea oxyodonta DC. in Wight, Contrib. 15.1834; Hook. f., Fl. Brit. India 3: 266. 1881; Gamble, Fl. Pres. Madras 686(482). 1921; Manilal & Sivar., Fl. Calicut 150. 1982; Ansari, Fl. Kasaragod Div. 210. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 245. 1988; S. Kumar in Hajra et al., Fl. India 13: 139. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 463. 2009.

Prostrate herbs, stem slender, radiating from the root stock, pubescent. Radical leaves simple, 5-8 x 2-3 cm, oblanceolate, apex obtuse, dentate; cauline leaves sessile, smaller. Heads few, 8 mm long, globose, in terminal panicles; bracts densely tomentose; outer 3 x 0.3 mm, lanceolate; inner 6 x 0.3 mm, linear. Female flowers yellow, many; corolla 3 mm long, lobes glandular hairy. Bisexual flowers few; corolla 4 mm long, broad. Achenes 3 mm long, ribbed, pubescent.

Ambalappara, *NS & KJD 31981*

Fl. & Fr.: October-May

Distribution: Rare in Evergreen forests of Ambalappara.

CENTRATHERUM Cass., Bull. Sci. Soc. Philom. Paris. 31. 1817.

Centratherum intermedium Less., Linnaea 4: 320. 1829.

Prostrate herbs. Leaves simple, alternate, 4-5 X 2-3 cm, Elliptic; Margin serrate; nerves pinnate. Heads terminal, single, pink coloured. Flowers numerous tube florets. Involucral phyllaries many-seriate. Corolla pink, tube slender, 5-lobed. Anthers obtuse.

Paripode, *KJD 18767*

Fl. & Fr.: August-January

Distribution: Former settlements.

CHROMOLAENA A. P. de Candolle, Prodr. 5: 133. 1836.

Chromolaena odorata (L.) King & Robins., Phytologia 20: 204. 1970; Manilal & Sivar., Fl. Calicut 151. 1982; Ansari, Fl. Kasaragod Div. 210. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 247. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 464. 2009. *Eupatorium odoratum* L., Syst. Nat. (ed. 10) 1205. 1759; Hook. f., Fl. Brit. India 3: 244. 1881; Uniyal in Hajra et al., Fl. India 12: 354.1995.

Shrubs, glandular hairy. Leaves simple, opposite, 8-12 x 5-8 cm, ovate, apex acute, base cuneate, crenate, hispid; petiole 2-3 cm long, cylindrical-oblong. Heads to 10 mm long, in terminal corymbose cymes; bracts 3-5-seriate, to 8 mm long, ovate, obtuse; outer smaller, inner linear, acute, 3-ribbed. Flowers few to many, similar, bisexual; corolla 5 mm long, white, tubular, 5-lobed, pubescent at apex. Achenes 4 mm long, linear, 5-angled, scabrous, black; pappus many, 4-7 mm long, setaceous, yellowish.

Kariyenkappu, *KJD 18769*

Fl. & Fr.: November-May

Distribution: Common weed in the Sanctuary.

CISSAMPELOPSIS (A. P. de Candolle) Miquel,

Fl. Ind. Batav. 2: 102. 1856.

Cissampelopsis corymbosa (Wall. ex DC.) Jeffrey & Chen., Kew Bull. 39: 341. 1984; R. Mathur in Hajra et al., Fl. India 13: 199.1995; Vanijajiva & Kadereit, Kew Bull. 63: 224. 2008; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 465. 2009. *Senecio corymbosus* Wall. ex DC. in Wight, Contrib. 22. 1834; Hook. f., Fl. Brit. India 3: 351. 1881; Gamble, Fl. Pres. Madras 723(508). 1921; Swarup. et al., Shola For. Kerala 40. 1998; Anil Kumar et al., Fl. Pathanamthitta 286. 2005.

Climbing shrubs, stem covered with fulvous-woolly hairs. Leaves simple, alternate, 6-8 x 6-8 cm, broadly ovate, apex acuminate, base cordate, 5-7 ribbed, glabrous above, distantly serrulate; petiole 3-4 cm long. Heads 9 x 6 mm, in woolly panicles, axillary or terminal; bracts 1-seriate, 6 x 1.5 mm, oblong, with thick midrib, glabrous; corolla 7 mm long; lobes acute, yellow; anthers tailed at base. Achenes oblong, glabrous, brown; pappus 7 mm long.

Kurumbankalu, *KJD 18774*

Fl. & Fr.: March-November

Distribution: Rare in Evergreen forests of Kurumbankallu.

CONYZA Less, Syn. Gen. Comp. 203. 1832, *nom. cons.*

Conyza bonariensis (L.) Cronq., Bull. Torrey Bot. Club 70. 632. 1943; Mohanan, Fl. Quilon Dist. 228. 1984; Ramach. & V.J. Nair, Fl. Cannanore Dist. 247. 1988; Hajra in Hajra et al., Fl. India 12: 104. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 466. 2009. *Erigeron bonariensis* L., Sp. Pl. 863. 1753. *Erigeron linifolius* Willd., Sp. Pl. 3: 1955. 1803; Hook. f., Fl. Brit. India 3: 254. 1881. *Conyza ambigua* DC., Fl. Fr. 6:468.1815; Gamble, Fl. Pres. Madras 683(480).1921.

Erect herbs, stem ribbed, hispid. Leaves simple, alternate, 8-20 x 1-3 cm, linear-elliptic to oblanceolate, apex acuminate, distantly serrate, hispid; petiole 1-2 cm long. Panicle 30-60 cm long, oblong, leafy. Heads 7 x 2 mm, oblong, cylindrical; bracts oblong, obtuse, 4 x 0.5 mm, glabrous; outer bracts smaller, hispid; corolla of female flowers 3 mm long, slender. Bisexual flowers inner, few; corolla 4 mm long, widening upward. Achenes 1.5 mm long, biconvex, truncate, hairy, yellow; pappus 4 mm long, yellow.

Ambalappara, *KVB 31765*

Fl. & Fr.: June-January

Distribution: Fairly common in Evergreen forests of Ambalappara.

CRASSOCEPHALUM Moench., Meth. 516. 1794.

Crassocephalum crepidioides (Benth.) S. Moore, J. Bot. 1: 211. 1912; Manilal & Sivar., Fl. Calicut 150. 1982; Ansari, Fl. Kasaragod Div. 210. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 248. 1988; R. Mathur in Hajra et al., Fl. India 13: 201. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 468. 2009. *Gynura crepidioides* Benth. in Hook., Niger Fl. 438. 1849. *Erechtites valerianaefolia* sensu C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1882(1302).1936, non (Wolf.) DC. 1838.

Tall herbs. Leaves 8-12 x 4-6 cm, lower ones lyrate pinnatifid, elliptic-ob lanceolate, apex acute, dentate, sparsely pubescent; petiole to 3 cm. Racemes terminal; phyllaries 1-seriate, 8 mm, lanceolate. Calyculus free at base of the phyllaries, to 3 mm. Flowers yellow, 9-10 mm long; ovary 2 mm, oblong, style 9 mm, bifid at apex. Achenes 4 mm, brown; pappus numerous, 8 mm long, white.

Ambalappara, KVB 31781

Fl. & Fr.: August-December

Distribution: Fairly common in Evergreen forests of Ambalappara, Chavachi and Kattikkari.

DICHROCEPHALA L' Herit. ex A. P. de Candolle, Arch. Bot. (Paris) 2: 517. 1833.

Dichrocephala integrifolia (L. f.) O. Ktze., Rev. Gen. Pl. 1: 333. 1891; Ramach. & V.J. Nair, Fl. Cannanore Dist. 248. 1988; Hajra in Hajra et al., Fl. India 12: 114. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 469. 2009. *Hippia integrifolia* L. f., Suppl. Pl. 389. 1781. *Dichrocephala latifolia* (Pers.) DC. in Wight, Contrib. 11. 1834; Hook. f., Fl. Brit. India 3: 245. 1881; Gamble, Fl. Pres. Madras 679(477). 1921. *Cotula latifolia* Pers., Syn. 2: 464. 1805; Hook. f., Fl. Brit. India 3: 245. 1881.

Diffuse herbs, hispid. Leaves alternate, 3-4 x 2-3 cm, ovate, apex obtuse, irregularly lobed. Heads 3-4 mm across, globose, in terminal panicles; bracts 1-seriate, lanceolate, acute, ciliate. Flowers two types. Female flowers in several outer rows; corolla tubular, 2-4-toothed at apex, glabrous. Bisexual flowers few, central; corolla 4-lobed at apex, white; anthers 4, connate, included. Achenes 1 mm long, obovate, compressed, 4-ribbed, glabrous; pappus 4 deciduous bristles.

Ambalappara, KJD 26136

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Ambalappara.

ECLIPTA L., Mant. Pl. 12: 157, 286. 1771, *nom. cons.*

Eclipta prostrata (L.) L., Mant. Pl. 2: 286. 1771; Manilal & Sivar., Fl. Calicut 152. 1982; Ansari, Fl. Kasaragod Div. 211. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 249. 1988; H.J. Chowdhery in Hajra et al., Fl. India 12: 381. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 469. 2009. *Verbesina prostrata* L., Sp. Pl. 902. 1753. *Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528. 1848; Hook. f., Fl. Brit. India 3: 304. 1881; Gamble, Fl. Pres. Madras 705(496). 1921; Vajr., Fl. Palghat Dist. 252. 1990. *Verbesina alba* L., Sp. Pl. 902. 1753. *Eclipta prostrata* (L.) L. var. *dixitii* Anand Kumar & Khanna, JETB 23: 713. 1999.

Herbs, caespitose, up to 25 cm high; stems terete, appressed strigose. Leaves simple, opposite, 1-3 x 0.2-0.5 cm, oblong, oblong-lanceolate or oblong-elliptic, acute or subacuminate at apex, cuneate at base, entire, densely strigose, sessile or subsessile. Heads 4-5 mm across; peduncles appressed strigose, 2-4 mm long. Involucral bracts in 2 rows; outer bracts 5, ovate-elliptic, ca 3.5 x 2.5 mm, subacuminate at apex, cuneate at base, strigose outside, glabrous inside; inner bracts 5, elliptic-obovate, ca 3 x 1.5 mm, subacuminate at apex, cuneate at base, sparsely strigose outside, glabrous inside. Ray florets 2-3-seriate, female, ca 4 mm long. Sepals minute, ovate, acute, membranous. Corolla ca 2.5 mm long; tube ca 0.8 mm long; limb ca 1.6 mm long, with 2 unequal, obtuse-tipped lobes at apex. Disk florets numerous, ca 3 mm long. Corolla campanulate, ca 1.6 mm long; lobes 4, ovate, ciliate on margin. Stamens 4 or 5, sagittate. Ovary 1.1-1.2 mm long, hairy at apex; style branches 2, pubescent. Palea ca 2.2 mm long, hairy in the upper two-third portion. Achenes yellowish brown to brown, oblong-turbinate, dorsiventrally compressed and sharply angled, hairy at apex; pappus of partially or completely united scales forming a cone at the apex.

Valayamchal, *KJD 26363*

Fl. & Fr.: Throughout the Year

Distribution: Along road side in moist localities.

ELEPHANTOPUS L., Sp. Pl. 814. 1753.

Elephantopus scaber L., Sp. Pl. 814. 1753; Hook. f., Fl. Brit. India 3: 242. 1881; Gamble, Fl. Pres. Madras 676(476). 1921; Manilal & Sivar., Fl. Calicut 149. 1982; Ansari, Fl. Kasaragod Div. 212. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 249. 1988; Uniyal in Hajra et al., Fl. India 13: 333. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 470. 2009.

Scapigerous herbs; whole plant scabrous. Leaves radical, rosetted at base, 6-18 x 2-5 cm, obovate to oblong or oblanceolate, base attenuate, margin crenate, apex obtuse or broadly acute, strigose above; cauline leaves small, narrow, sessile, base amplexicaule. Heads, homogamous, non-rayed, sessile, aggregated in dense, stalked glomerules, subtended by 3 ovate, reduced leaves. Involucral bracts 2-seriate, scarious. Flowers 2-5, bisexual. Corolla purple; tube 5-6 mm long, lobes 5. Stamens 5, auricled at base. Ovary 3-4 mm, oblong; style arms subulate. Achenes 4-5 mm long, 10-ribbed; pappus of 4-6 spiny bristles, c. 5 mm long.

Kariyenkappu, *KJD 26365*

Fl. & Fr.: October-January

Distribution: Fairly common in Plantations of Kariyenkappu and Evergreen forests of Chavachi.

EMILIA Cass., Bull. Sci. Soc. Philom. Paris 68. 1817.

Emilia sonchifolia (L.) DC. in Wight, Contrib. 24.1834; Hook. f., Fl. Brit. India 3: 336. 1881; Gamble, Fl. Pres. Madras 716(503). 1921; Manilal & Sivar., Fl. Calicut 149. 1982; Ansari, Fl. Kasaragod Div. 212. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 250. 1988; R. Mathur in Hajra et al., Fl. India 13: 212. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 471. 2009. *Cacalia sonchifolia* L., Sp. Pl. 835. 1753.

Erect or diffuse herbs. Leaves radical and cauline; radical leaves 4-10 x 1-3 cm, lyrate-pinnatifid with large terminal lobes, semi-orbicular; cauline leaves small, obovate to spatulate. Heads homogamous, not rayed, 1-3 on long slender

peduncles. Involucral bracts cylindric, uniseriate, 6-8 mm long, oblong-lanceolate. Florets bisexual. Corolla pink, 3-3.5 mm long, wider to the mouth, lobes 5. Stamens 5; anthers 1-1.5 mm long. Ovary c. 1.5 mm long; style-arms acute. Achenes 1-2 mm long, 5-ribbed, hispid; pappus white, silky, 5-6 mm long.

Ambalappara, KJD 18746

Fl. & Fr.: July-December

Distribution: Common in Evergreen forests of Ambalappara and Chavachi.

HELICHRYSUM P. Miller, Gard. Dict. Abr., ed. 4. 462. 1754.

Helichrysum buddleioides DC. in Wight, Contrib. 20. 1834; Hook. f., Fl. Brit. India 3: 290. 1881; Gamble, Fl. Pres. Madras 699(491). 1921; P.C. Pant in Hajra et al., Fl. India 13: 99.1995. *Hedysarum hookerianum* Wight & Arn. in DC., Prodr. 6: 201. 1838. *Helichrysum buddleioides* var. *hookerianum* (Wight & Arn.) Hook. f., Fl. Brit. India 3: 291. 1881; Pant in Hajra et al., Fl. India 13: 99.1995.

Subshrubs, 50-70 cm high, densely cottony wooly. Leaves simple, alternate, 5-10 x 1.5-2 cm, elliptic-oblong, acute at apex, narrowed and amplexicaule at base, sparsely cottony above, 5-7-ribbed. Heads 4 x 4 mm, globose, densely packed; bracts 3-4-seriate, 3.5 x 1 mm, oblanceolate, obtuse, yellow or hyaline, glabrous. Bisexual flowers 10-15; corolla 2 mm long, glabrous, yellow. Female flowers many; corolla 3 mm long. Achenes 3-angled, scabrid.

Ambalappara, KJD 31729

Fl. & Fr.: November-March

Distribution: Fairly common in Evergreen forests of Ambalappara.

LAGGERA Sch.-Bip. Ex Hochst., Linnaea 19: 391. 1847.

Laggera alata (D. Don) Sch.-Bip. ex Oliver, Trans. Linn. Soc. London 29: 94. 1873; Hook. f., Fl. Brit. India 3: 271. 1881; Gamble, Fl. Pres. Madras 689(485). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 252. 1988; S. Kumar in Hajra et al., Fl. India 13: 148.1995. *Erigeron alatum* D. Don, Prodr. Fl. Nepal. 171. 1825. *Blumea alata* (D. Don) DC., Prodr. 5: 488. 1836; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 460. 2009.

Subshrubs; stems winged, densely villous. Leaves simple, alternate, to 8 x 2 cm, obovate-oblong, obtuse, sessile, decurrent at base along the stem. Heads 12 x 4 mm, in terminal leafy panicle; bracts many-seriate, to 8 x 1 mm, oblong-lanceolate, acute to acuminate. Female flowers outer several rows; corolla 4 mm long, slender, 4 toothed at apex. Bisexual flowers few, central; corolla 7 mm long, pink, lobes acute, glabrous. Achenes 2 mm long, ribbed, hispid; pappus 7 mm long, white.

Ambalappara, KVB 31786; KJD 26342

Fl. & Fr.: December-March

Distribution: Fairly common in Evergreen forests of Ambalappara.

LAUNAEA Cass., Dict. Sci. Nat. 25: 61, 321. 1822.

Launaea acaulis (Roxb.) Babc. ex Kerr. in Craib, Fl. Siam. 2: 299. 1936; Ramach. & V.J. Nair, Fl. Cannanore Dist. 252. 1988; Hajra in Hajra et al., Fl. India 12: 304. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 474. 2009. *Prenanthes acaulis* Roxb., Fl. Ind. 3: 403. 1832. *Crepis acaulis* (Roxb.) Hook. f., Fl. Brit. India 3: 396. 1881; Gamble, Fl. Pres. Madras 730(513). 1921.

Scapigerous perennial herbs with thick rootstock; juice milky. Leaves all basal, 8-15 x 1-3 cm, oblong, acute or obtuse, entire or finely toothed, glabrous. Heads 15 x 8 mm, cylindrical, 10-15 together, cymose, on elongated

scapes. Scapes 3-5, 15-20 cm high, branched, glabrous. Bracts uniseriate, 10 x 2.5 mm, acute, oblong, margins white. Flowers all ligulate; corolla bright yellow, 18 mm long, glabrous, limb oblong; anthers sagittate at base. Achenes 5 x 1 mm, compressed, yellowish brown.

Ambalappara, NS & KVB 31350

Fl. & Fr.: March-September

Distribution: Rare in Evergreen forests of Ambalappara.

MIKANIA Willd., Sp. Pl. 3:1742.1803, *nom. cons.*

Mikania micrantha Kunth in HBK, Nov. Gen. Sp. 4: 134. 1820; Uniyal in Hajra et al., Fl. India 12: 357.1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 475. 2009. *Mikania scandens* Clarke, Comp. Ind. 34. 1876, non L.; Hook. f., Fl. Brit. India 3: 144. 1881. *Mikania cordata* (Burm. f.) Robins., Contrib. Gray Herb. 104:65.1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 253. 1988. *Eupatorium cordatum* Burm. f., Fl. Ind. 176. t. 58. 1768.

Climbers, stem glandular-hispid. Leaves simple, opposite, 5-8 x 4-6 cm, ovate, apex acute, base cordate, crenate, glabrate; petiole 2-4 cm long. Heads 5 mm long, in axillary panicles; bracts biseriate, outer 2 smaller, inner 3-5, 4 x 1.5 mm, ovate, obtuse. Flowers 3-5, similar, bisexual; corolla 3 mm long, tubular, lobes 5, glandular, white; anthers linear. Achenes 2 mm long, 5-ribbed, black, glabrous; pappus 4 mm long, many, hispid.

Kariyenkappu, KJD 26249

Fl. & Fr.: February-April

Distribution: Common weed in the Sanctuary.

PHYLLOCEPHALUM Blume, Bijdr. 888. 1826.

Phyllocephalum scabridum (DC.) Kirkman, Rhodora 83: 10. 1981; Ansari, Fl. Kasaragod Div. 213. 1985; Uniyal in Hajra et al., Fl. India 13: 344.1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 477. 2009. *Decaneurum scabridum* DC. in Wight, Contrib. 7. 1834. *Decaneurum molle* DC., Prodr. 5: 67. 1836. *Centratherum molle* (DC.) Benth. in Benth. & Hook. f., Gen. Pl. 2: 225. 1873; Hook. f., Fl. Brit. India 3: 227. 1881; Gamble, Fl. Pres. Madras 666(469). 1921; Vajr., Fl. Palghat Dist. 250.

Erect herbs. Leaves 12-15 x 4-6.5 cm, elliptic, acuminate at both ends, thinly scabrid above, deeply serrate. Peduncles 1.5 cm long, tomentose. Heads 1.3 x 1 cm, few; inner bracts 9 x 2 mm; outer bracts 8 x 4 mm, white-tomentose, ciliate along the margins. Flowers 12-15; corolla 8 mm long; lobes oblong, glabrous. Achenes 1.5 mm long; pappus few, 2.5 mm long.

Ambalappara, NS & KJD 31963

Fl. & Fr.: July-December

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Western Ghats

SPILANTHES Jacq., Enum. Syst. Pl. 8. 1760.

- 1a. Heads not rayed, white..... *S. radicans*
1b. Heads rayed, yellow..... *S. paniculata*

Spilanthes ciliata HBK, Nov. Gen. & Sp. Pl. 4: 621. 1836; Sivar. et al., Anci. Sci. of Life 3: 171. 1984; Sivar. & Remesan, Journ. Econ. Tax. Bot. 10: 145. 1987; H.J. Chowdhery in Hajra et al., Fl. India 12: 409. 1995; Joseph, Aquatic Angiosp. Malabar 52. 1991. *Acmella ciliata* (HBK) Cass., Dict. Sc. Nat. 24: 331. 1822.

Diffuse herbs rooting at lower nodes; stem terete. Leaves simple, opposite, 7 x 4 cm, ovate, base rounded or subcordate, margins serrate, apex acute;

petiole 1-2.5 cm long. Heads rayed, axillary, usually solitary, rarely 2-3 in each axil, c. 1 cm across, subglobose, turning conical, yellow; peduncle 3-8 cm long. Involucral bracts 2-seriate, shorter than ray florets, inner series narrower and smaller, up to 6 x 2 mm, elliptic, subacute. Palea c. 3 mm long, boat-shaped, concave, obtuse, keeled. Ray florets 8-12, female, ligulate; corolla tube c. 1 mm long, limb 3-lobed; pappus of 3 awns, deciduous; achenes trigonous, black, strongly margined and ciliate along the margins. Disc florets many, bisexual; pappus of 2 unequal bristles; corolla tube c. 2 mm long, lobes much shorter than the tube. Achenes c. 2 x 0.5 mm, oblong, truncate at apex, laterally compressed, black, strongly margined, ciliate along the margins.

Chavachi, NS & KJD 31944

Fl. & Fr.: August-December

Distribution: Fairly common in Evergreen forests of Chavachi, Mullenpara and Kattikkari.

Spilanthes radicans Jacq., Collect. Bot. Chen. Hist. Nat. 11: 1714. 1804; Sivar. & Matthew, Anci. Sci. of Life 3: 169. 1984; Sivar. & Remesan, Journ. Econ. Tax. Bot. 10: 144. 1987; H.J. Chowdhery in Hajra et al., Fl. India 12: 412. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 480. 2009.

Erect herbs, 30-70 cm high; stem glabrous. Leaves simple, opposite, 7 x 4 cm, ovate, acute, crenulate along the margins, glabrous; petiole 1-2 cm long. Heads 7-12 x 6-8 mm, solitary or 2-3 together; peduncles 3-5 cm long, puberulus; bracts 4 x 1 mm, glabrous. Flowers similar; corolla 2 mm long, 3-lobed. Achenes 2 types, marginal ones 3-angled, central achenes laterally compressed, obovate, truncate, ciliate along the edges, cilia longer towards the apex.

Ambalappara, KVB 31651

Fl. & Fr.: October-March

Distribution: Common in Evergreen forests of Ambalappara, Kattikkari and Mullenpara.

SYNEDRELLA Gaertn., Fruct. 2: 456. 1791, *nom. cons.*

Synedrella nodiflora (L.) Gaertn., Fruct. 2: 456. t. 171. 1791; Hook. f., Fl. Brit. India 3: 308. 1881; Gamble, Fl. Pres. Madras 708(498). 1921; Manilal & Sivar., Fl. Calicut 152. 1982; Ansari, Fl. Kasaragod Div. 216. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 255. 1988; H.J. Chowdhery in Hajra et al., Fl. India 12: 413. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 481. 2009. *Verbesina nodiflora* L., Cent. Pl. 1: 28. 1755 & Ameen. Acad. 4: 290. 1759.

Erect branched herbs; stem adpressed hairy. Leaves simple, opposite, 4-8 x 2-4 cm, elliptic-ovate, apex acute, base cuneate to truncate, narrowly winged on the petiole, margin serrate, scabrous on both sides, basally 3-nerved; petiole to 3 cm. Heads solitary, axillary and terminal, few-flowered, 0.5-1 cm across, radiate. Phyllaries 2-seriate; outer foliaceous, inner paleaceous. Flowers heterogamous, yellow. Ray flowers: female; corolla tube 2-2.5 mm long; ligule 1-2 mm long, 2-3-lobed; ovary 3 mm long, oblong, winged; style-arms acute. Disc flowers; bisexual; corolla tube 2-3 mm long, lobes 5; stamens 5, included, ovary 2-3 mm long. Achenes 3-4 mm long, dimorphic: of ray florets dorsally compressed, with lacerate wings; of disc florets trigonous, not winged, with 2 or 3 rigid awns.

Chavachi, KJD 22525

Fl. & Fr.: Throughout the year

Distribution: Fairly common weed in Evergreen forests of Kattikkari and Chavachi; Plantations of Kariyenkappu.

TRIDAX L., Sp. Pl. 900. 1753.

Tridax procumbens L., Sp. Pl. 900. 1753; Hook. f., Fl. Brit. India 3: 311. 1881; Gamble, Fl. Pres. Madras 711(500). 1921; Manilal & Sivar., Fl. Calicut 154. 1982; Ansari, Fl. Kasaragod Div. 217. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 255. 1988; H.J. Chowdhery in Hajra et al., Fl. India 12: 418. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 482. 2009.

Procumbent herbs. Leaves simple, opposite, 3-6 x 1.5-3 cm, ovate, apex acute, serrate, bulbous-based hairy; petiole 5-10 mm long. Heads 1.3 x 1.5 cm, solitary, on long peduncles; bracts in 3-series, lanceolate, hairy. Outer row of flowers ligulate, female, limb 3 x 2 mm, 3-toothed, white; inner flowers bisexual, tubular; corolla 6 mm long, 5-lobed at apex, yellow. Achenes 2 mm long, obovoid, densely hairy; pappus many, setaceous.

Paripode, KJD 22540

Fl. & Fr.: Throughout the year

Distribution: Along the boundaries of Farm at Paripode.

VERNONIA Schreb., Gen. 2: 541. 1791, *nom. cons.*

- 1a. Achens not ribbed *V. cinerea*
- 1b. Achens ribbed 2
- 2a. Trees, heads 1-flowered *V. arborea*
- 2b. herbs, heads many flowered 3
- 3a. Leaves white tomentose beneath *V. indica*
- 3b. Leaves glabrous beneath 4
- 4a. Achens glandular, pappus brown *V. divergens*
- 4b. Achens glabrous or hairy, pappus reddish *V. ornata*

Vernonia arborea Buch.-Ham., Trans. Linn. Soc. London 14: 218. 1824; Hook. f., Fl. Brit. India 3: 239. 1881; Ramach. & V.J. Nair, Fl. Cannanore Dist. 256. 1988; Uniyal in Hajra et al., Fl. India 13: 359. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 484. 2009. *Monosis wightiana* DC. in Wight, Contrib. 1. 1834 & Ic. t. 1085. 1846. *Vernonia monosis* Benth. ex Clarke, Comp. Ind. 24. 1876p.p., non Sch.-Bip. 1847; Gamble, Fl. Pres. Madras 672(473). 1921. *Vernonia arborea* Buch.-Ham. *var. wightiana* (DC.) Hook. f., Fl. Brit. India 3: 239. 1881.

Trees; to 12 m high; bark 5-6 mm thick, grey, mottled with white and green, rough, marked with vertical cracks, exfoliations small, squarish; branchlets densely brown silky tomentose. Leaves simple, alternate, 10-29 x 4-10 cm, obovate, elliptic-obovate or elliptic-oblancoate, apex acuminate, base acute, obtuse, cuneate or attenuate, margin entire or distantly serrate, chartaceous, glabrous above and densely brown tomentose beneath; petiole 7-21 mm long, stout, densely pubescent, grooved above; lateral nerves 8-13 pairs, parallel, prominent, raised beneath; intercostae subscalariform. Flowers bisexual, purple, in heads arranged in terminal tomentose panicles; capitula 1 flowered, receptacle small; involucre tubular 0.3 cm across; phyllaries thick scarious-outer orbicular-ovate 1.3-1 mm, pubescent without, obtuse, inner one oblong, 4.5 x 1.5 mm, thinly ciliate-glabrescent, 3-nerved, faint, ending abruptly in the middle, calyx tube adnate to the ovary, pappus 1 seriate, to 7 mm, barbellate; corolla 5 mm across; tube cylindrical 6.5 mm, lobes lanceolate, 3.5 mm; stamens 5, inserted within the corolla tube, anthers 2.5 mm, base fimbriate, basifixed, connate, connective produced upwards; ovary oblong, 1-celled, shortly beaked above, 2.2 x 1.5 mm, narrowed below ovule solitary, erect, style 1 cm, linearly 2 fid; stigma puberulous, recurved, acute. Achenes, 2 mm long, 10-ribbed with glands in between; pappus hairs white.

Ambalappara, KVB 31697

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Ambalappara, Mullenpara and Kattikkari.

Vernonia cinerea (L.) Less., *Linnaea* 4: 291. 1829; Hook. f., *Fl. Brit. India* 3: 233. 1881; Gamble, *Fl. Pres. Madras* 676(475). 1921; Manilal & Sivar., *Fl. Calicut* 149. 1982; Ansari, *Fl. Kasaragod Div.* 218. 1985; Uniyal in Hajra et al., *Fl. India* 13: 367. 1995; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 484. 2009. *Conyza cinerea* L., *Sp. Pl.* 862. 1753.

Annual or perennial herbs, stem ribbed, smooth or puberulus. Leaves variable, 2-8 x 1-3 cm, ovate, acute at both ends, thinly hairy below; petiole 1-2 cm long, slender. Heads 5 x 3 mm, in terminal corymbose cymes, peduncled; outer bracts minute, inner oblong, acute, cuspidate, hairy. Flowers 5-10, similar; corolla 3 mm long, glabrous, bluish-purple. Achenes 1.5 mm long, hairy; outer pappus 1 mm long, setaceous, inner 3 mm long.

Chavachi, NS & KJD 25522

Fl. & Fr.: Throughout the year

Distribution: Common in Evergreen forests of Chavachi, Semi-Evergreen forests of Paripode, Valayamchal and Narikkadavu.

Vernonia divergens (Roxb.) Edgew., *J. Asiat. Soc. Bengal* 21: 172. 1853; Hook. f., *Fl. Brit. India* 3: 234. 1881; Gamble, *Fl. Pres. Madras* 673(473). 1921; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 257. 1988; Uniyal in Hajra et al., *Fl. India* 13: 370. 1995; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 485. 2009. *Eupatorium divergens* Roxb., *Fl. Ind.* 3: 414. 1832.

Erect shrubs, stem reddish, grey-tomentose. Leaves simple, alternate, 7-10 x 3-5 cm, elliptic, acute at both ends, serrate, scabrous above, pubescent beneath, nerves 6-8 pairs, regular; petiole 1-2 cm long. Heads 6 x 4 mm, globose; bracts oblong, acute, grey tomentose. Flowers few, corolla 12 mm long, glabrous. Achenes 2 mm long, glandular; pappus all setaceous, brown.

Ambalappara, KVB 31791; KJD 26345

Fl. & Fr.: November-March

Distribution: Common in Evergreen forests of Ambalappara, Mullenpara and Kattikkari.

Vernonia indica Clarke, *Comp. Ind.* 16. 1876; Hook. f., *Fl. Brit. India* 3: 238. 1881; Gamble, *Fl. Pres. Madras* 674(474). 1921; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 257. 1988; Uniyal in Hajra et al., *Fl. India* 13: 372. 1995; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 486. 2009.

Shrubs, 1-2 m high, usually not branching; stems white-wooly. Leaves simple, alternate, 12 x 5 cm, elliptic, acute at base and apex, serrate, glabrous above, densely white-tomentose below; nerves 6-8 pairs, raised below, reticulate. Heads many, 8 x 5 mm, globose, in paniced cymes; bracts unequal, oblong, obtuse, cottony-hairy. Flowers 5-10; corolla to 7 mm long, pink, glabrous. Achenes 2 mm long, strongly ribbed, glandular; pappus outer setaceous or absent; inner 6 mm long, setaceous, yellow.

Ambalappara, KVB 31764, 31789; KJD 26343

Fl. & Fr.: October-January

Distribution: Common in Grasslands of Ambalappara. Endemic to Western Ghats.

Vernonia ornata Talbot, Journ. Bombay Nat. Hist. Soc. 11: 691. Pl. 13. 1898; Uniyal in Hajra et al., Fl. India 13: 376. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 486. 2009. *Vernonia dalzelliana* Drumm. & Hutch., Bull. Misc. Inform. Kew 1909: 261. 1909; Gamble, Fl. Pres. Madras 674(474). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 257. 1988; Manilal, Fl. Silent Valley 161. 1988.

Herbs or undershrubs, upto 1.25 m tall; stems ribbed, glandular pubescent above. Leaves simple, alternate, 14 x 5 cm, elliptic, oblanceolate, ovate or obovate, acute or acuminate, membranous, sparsely pubescent above and on the nerves beneath, petioled. Inflorescence corymbose, axillary and terminal. Heads ca. 1.2 cm across, ca 15-flowered; peduncle slender, upto 6.8 cm long, with 1 or more subulate bracts. Involucral bracts many-seriate, decurrent on the peduncle, acute, obtuse, apiculate or mucronate, ciliate and darker near the tip; outer ca. 2.5 mm long; innermost ca. 6 mm long. Achenes 2 mm long, glabrous or hairy, 10-ribbed. Pappus hairs reddish, outer very short.

Mullenpara, NS & KJD 31930, 31931

Fl. & Fr.: October-March

Distribution: Common in Evergreen forests of Kattikkari, Mullenpara and Kannadivechakunnu. Endemic to southern Western Ghats.

WEDELIA Jacq., Enum. Pl. Carib. 8, 28. 1760, *nom. cons.*

Wedelia trilobata (L.) A. S. Hitchc., Rep. Missouri Bot. Gard. 4: 99. 1898; Sivar. & Pradeep, Indian J. For. 11: 161. 1988; H.J. Chowdhery in Hajra et al., Fl. India 12: 426. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 486. 2009. *Silphium trilobatum* L., Syst. (ed. 10) 1232. 1759.

Herbs, perennial, prostrate, diffuse, rooting at nodes; stems glabrous or pubescent. Leaves 3-10 x 3-7 cm, elliptic-obovate, usually with 3 angular lobes with toothed margins, acute at apex, basally cuneate, glabrous to sparingly pubescent; petiole short, upto 5 mm. Heads radiate, 2-2.5 cm across, solitary on ebracteate 4-15 cm long peduncles. Involucre green; bracts lanceolate, 1-1.5 cm long, ciliate; inner narrower. Ray florets 5-8; corolla bright yellow, 1.5-2.0 x 0.5-0.7 cm, 3-4 denticulate; tube short. Ovary trigonous; stigma bilobed. Pappus connate into a spathiform, fimbriate cup at the apex, devoid of awns. Disc florets many; corolla yellow; tube 5-8 mm long, 5-lobed; lobes deltoid, densely pubescent within. Anthers black, syngeneious. Style branches flattened and marginally pubescent. Achenes blackish, warty, 4-6 mm long, crowned by the persistent pappus cup.

Kariyenkappu, KVB 31611

Fl. & Fr.: June-September

Distribution: A weed in old settlements.

LOBELIACEAE

LOBELIA L., Sp. Pl. 929. 1753.

- 1a. Tall herbs, basal leaf more than 10 cm long, flowers >3cm.....*L. nicotianifolia*
- 1b. Small herbs, basal leaves less than 3 cm, flowers <1 cm
- 2a. Seeds trigonous *L. alsinoides*
- 2b. Seeds ellipsoid *L. heyneana*

Lobelia alsinoides Lam., Encycl. 3: 588. 1792; Manilal & Sivar., Fl. Calicut 155. 1982; Haridasan & P.K. Mukh. in Nayar et al., Fasc. Fl. Ind. 19: 42. 1988; Ramach. & V.J. Nair, Fl. Cannanore Dist. 259. 1988; Joseph, Aquatic Angiosp.

Malabar 98. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 487. 2009; Rajeev & Diwakar, Indian J. For. 33: 626. 2010. *Lobelia trigona* Roxb., Fl. Ind. 2: 111. 1824; Hook. f., Fl. Brit. India 3: 423. 1881; Gamble, Fl. Pres. Madras 736(518). 1921.

Decumbent herbs, rooting from lower nodes, stem 3-winged. Leaves simple, alternate, 1-2 x 1-1.5 cm, ovate-orbicular, apex obtuse, crenate, petiolate; petiole 3 mm broad; upper leaves sessile, elliptic, acute, smaller. Flowers in terminal raceme. Sepals 5 mm long, lanceolate. Corolla blue, 10 mm long, upper 3 lobes obovate, lower 2 lobes narrower. Capsule 6 mm long, glabrous; seeds trigonous, brown.

Paripode, KJD 22550

Fl. & Fr.: August-October

Distribution: Fairly common along the boundaries of Farm at Paripode and plantations at Kariyenkappu.

Lobelia heyneana Schult. in Roem. & Schult., Syst. Veg. 5: 50. 1819; Haridasan & Mukh. in Nayar et al., Fasc. Fl. Ind. 19: 51. 1988; Rajeev & Diwakar, Indian J. For. 33: 628. 2010. *Lobelia dichotoma* Miq., Fl. Ind. Bat. 2: 576. 1856; Haridasan & P.K. Mukh. in Nayar et al., Fasc. Fl. Ind. 19: 47. 1988. *Lobelia trialata* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 157.1825; Hook. f., Fl. Brit. India 3: 425. 1881, incl. *var. lamifolia*; Gamble, Fl. Pres. Madras 736(518). 1921.## *Lobelia zeylanica* sensu Clarke in Hook.f., Fl. Brit. India 3: 425. 1881, incl. *var. walkeri*.

Diffuse herbs, stem 3-winged, glabrous. Leaves simple, alternate, 3 x 1.5 cm, obovate, apex obtuse or acute, base narrowly winged on the petiole, crenate-serrate, nerves 4 pairs; upper leaves sessile. Flowers in terminal, short raceme. Sepals 4.5 x 1 mm, lanceolate, glabrous. Corolla blue, 10 mm long, ventral lobe broader; lateral and dorsal lobes lanceolate. Anthers 2.5 mm long, 2 anthers with penicillate black hairs at apex. Style stout, curved; stigma with a ring of hairs below.

Ambalappara, KJD 25431

Fl. & Fr.: August-November

Distribution: Rare in the Grasslands.

Lobelia nicotianifolia Roth ex Roem. & Schult., Syst. Veg. 5: 47. 1819; Hook. f., Fl. Brit. India 3: 427. 1881; Gamble, Fl. Pres. Madras 736(518). 1921; Haridasan & Mukh. in Nayar et al., Fasc. Fl. Ind. 19: 53. 1988; Ramach. & V.J. Nair, Fl. Cannanore Dist. 260. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 488. 2009; Rajeev & Diwakar, Indian J. For. 33: 630. 2010. *Lobelia nicotianifolia* Roth ex Roem. & Schult. *var. trichandra* (Wight) Clarke in Hook.f., Fl. Brit. India 3: 427. 1881; Gamble, Fl. Pres. Madras 737(518). 1921. *Lobelia trichandra* Wight, Ic. t. 1171. 1848.

Shrubs. Leaves distant, simple, alternate, 17 x 4 cm, elliptic, base attenuate, tip acuminate, chartaceous, margin inconspicuously serrate. Racemes terminal or in upper axils, to 50 cm. Calyx tube 3 mm, lobes 12 x 2 mm, lanceolate. Corolla 3-3.5 cm long, tube 15 mm long, constricted below lobes, upper lobe 15 mm, lower 5 mm. Staminal filaments basally free; anthers puberulous. Capsule 0.8 x 0.6 cm, cupular; seeds broad-elliptic.

Kattikkari, KVB 31557

Fl. & Fr.: October-March

Distribution: Fairly common in Evergreen forests of Ambalappara and Kattikkari.

VACCINIACEAE

VACCINIUM L., Sp. Pl. 349. 1753.

Vaccinium neilgherrense Wight, Calcutta J. Nat. Hist. 8:173.1847 & Ic. t. 1189. 1848; Hook. f., Fl. Brit. India 3: 454. 1882, "nilgherrense"; Gamble, Fl. Pres. Madras 741(521). 1921.

Small trees, branchlets drooping. Leaves simple, alternate, 9 x 1.5 cm, lanceolate, acuminate, crenate-serrate; nerves very oblique. Flowers 10 mm long, in axillary racemes. Calyx tube globose, glabrous, lobes ovate, ciliate. Corolla 6-8 mm long, white with pink shades, glabrous, lobes ovate, spreading. Stamens 10, free, filaments tomentose. Ovary inferior, 5-celled; ovules many; style cylindrical. Berry globose, 8 mm across; seeds many.

Ambalappara, NS & KVB 31353, 31756

Fl. & Fr.: February-April

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

MYRSINACEAE

- 1a. Ovary half inferior; berry many seeded *Maesa*
- 1b. Ovary superior; berry 1-seeded..... 2
- 2a. Climbing shrubs; flowers in terminal paniced racemes..... *Embelia*
- 2b. Erect shrubs or trees; flowers not in panicles 3
- 3a. Flowers densely clustered in fascicles..... *Rapanea*
- 3b. Flowers in umbels or racemes *Ardisia*

ARDISIA Sw., Prodr. 3, 48. 1788. *nom. cons.*

- 1a. Flowers 2 cm across, in simple racemes *A. solanacea*
- 1b. Flowers 1 cm across, in paniculate umbels..... *A. sp.*

Ardisia solanacea Roxb., Pl. Corom. t. 27. 1795 & Fl. Ind. 1:580.1832; Gamble, Fl. Pres. Madras 756(531).1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 262. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 491. 2009. *Ardisia humilis* sensu Wight, Ic.t.1212. 1848, non Vahl 1794; Hook. f., Fl. Brit. India 3: 529. 1882.

Trees, to 6 m high; bark brown, smooth. Leaves simple, alternate, 10-18 x 4-6 cm, obovate, elliptic-obovate or oblanceolate, apex acuminate or acute, base cuneate, margin entire or obscurely crenate, glabrous, glaucous beneath, coriaceous, gland-dotted; petiole to 10 mm long, stout, glabrous; lateral nerves 9-20 pairs, parallel, slender, obscure, secondary laterals faint, intercostae obscure. Flowers bisexual, 1.3 cm across, bright pink, in axillary or lateral umbels; peduncle 5-(12) cm long; bracts 1.5-2 mm long, concave, deciduous. Calyx lobes 5, 3 x 1.5 mm, concave, ovate, obtuse, ciliate, persistent, leathery, twisted to right. Corolla 2.5 cm across; lobes 5, twisted to right, in bud, 10 x 7 mm, ovate, coriaceous, punctuate. Stamens 5, connivent around style, exserted; filaments short; anthers sagittate, 7 mm. Ovary superior, globose 3 x 2 mm, 1-celled; ovules many; style elongate, as long as the corolla lobes; stigma terminal. Fruit a berry 8 mm across, globose, bright red.

Kannadivechakunnu, NS & KVB 31373

Fl. & Fr.: March-August

Distribution: Rare in Evergreen forests of Kannadivechakunnu.

Ardisia sp.

Large shrubs. Leaves simple, alternate, 10-22 x 4-6 cm, ovate to elliptic, acute to acuminate at apex, acute at base, entire; nerves ca. 16 pairs, strongly punctuate along the margins; petiole 5 mm long. Umbels terminal or axillary, 5 x 5 cm, peduncled; pedicels 5-6 mm long. Flowers 5-15 in an umbel, pale white. Calyx lobes 5, 3 x 1.5 mm, ovate, acute, hairy. Corolla lobes 5, 4 mm long, ovate, acute, punctate; anthers acute. Berry 6-7 mm across, black, glabrous.

Pothurumi, KVB 31664

Fl. & Fr.: November-June

Distribution: Common in Evergreen forests of Kattikkari and Pothurumi.

This species is allied to *A. sonchifolia*, but differs by its elliptic-ovate lanceolate leaf, acuminate base, glabrous, unbranched umbel, white corolla.

EMBELIA Burm. f., Fl. Ind. 62. 1768. *nom. cons.*

Embelia ribes Burm. f., Fl. Ind. 62. t.23.1768; Hook. f., Fl. Brit. India 3:513.1882; Gamble, Fl. Pres. Madras 752(529). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 262. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 492. 2009. *Embelia glandulifera* Wight, Ic. t. 1207. 1848.

Climbers; branchlets slender, white, without lenticellate. Leaves simple, alternate, 7 x 3 cm, elliptic, acute at both ends; nerves many, parallel, faint; petiole 1 cm long. Panicles to 15 x 15 cm, glabrous, branches long, slender racemose; pedicels 1.5 cm long. Flowers small, white, many. Sepals small, triangular, tomentose. Petals 2 mm long, ovate, acute, densely tomentose on both sides. Berry 3-4 mm across, globose, bluish-purple; seed one.

Poathanplavu, NS & KVB 31329

Fl. & Fr.: March-August

Distribution: Fairly common in Evergreen forests of Poathanplavu and Moonamthode.

MAESA Forssk., Fl. Aegypt.-Arab. 66. 1775.

Maesa indica (Roxb.) DC., Trans. Linn. Soc. London 17: 134. 1834; Ramach. & V.J. Nair, Fl. Cannanore Dist. 262. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 493. 2009. *Baeobotrys indica* Roxb., Fl. Ind. 2: 230. 1824. *Maesa dubia* (Wall.) DC., Trans. Linn. Soc. London 17: 134. 1834; Hook. f., Fl. Brit. India 3: 510. 1882; Gamble, Fl. Pres. Madras 749(527). 1921. *Maesa perrottetiana* A. DC. in DC., Prodr. 8: 80. 1844; Gamble, Fl. Pres. Madras 749(527). 1921. *Maesa indica* (Roxb.) DC. var. *perrottetiana* (A. DC.) Clarke in Hook. f., Fl. Brit. India 3:509.

Large shrubs; branchlets glandular. Leaves simple, alternate, 10-15 x 4-8 cm, ovate, acute at apex, rounded and cuneate at base, serrate, glandular, membranous, with many glandular lines; nerves 10 pairs, regular; petiole 1.5-3 cm long. Flowers in axillary branched 3-6 cm long racemes; pedicels 2 mm long; bracteoles 2, opposite, inserted, below the calyx. Calyx tube adnate to the ovary, lobes 5, orbicular, 0.5 mm long. Corolla white, 4 mm across, lobes obovate. Stamens 5; anthers orbicular. Ovary 1-celled, ovules many, immersed in globose placenta, stigma capitate. Fruit a fleshy berry, 4 mm across; seeds few, angular, black.

Ambalappara, KVB 31501; NS & KJD 31948

Fl. & Fr.: September-May

Distribution: Common in Evergreen forests of Ambalappara and Pothurumi.

RAPANEA Aubl., Hist. Pl. Guiane 1: 121, t. 46. 1775.

Rapanea capitellata (Wall.) Mez in Engl., Pflanzenreich Myrsin. 356. 1902; Gamble, Fl. Pres. Madras 750(528). 1921. *Myrsine capitellata* Wall. in Roxb., Fl. Ind. 2: 295. 1824; Hook. f., Fl. Brit. India 3: 512. 1882 p.p.

Trees, to 15 m high; branchlets stout, glabrous, covered with numerous closely placed leaf scars. Leaves simple, alternate below, opposite above, 5-12 x 1-4.5 cm, elliptic, oblanceolate or obovate, apex acute or obtusely acute, base cuneate or attenuate, margin entire, glabrous, coriaceous; petiole 5-7 mm long, stout, glabrous; lateral nerves 6-8 pairs, pinnate, faint, intercostae obscure. Flowers bisexual, white, sessile, very shortly stalked in umbellate fascicles, axillary or around branchlets; peduncle 1.5 mm; bracts minute. Calyx lobes 5, 1.5 mm, ciliate, acute. Corolla 5 mm across; lobes 5, oblanceolate, 3.5 mm, valvate, gland-dotted. Stamens 5, exerted, subsessile. Ovary superior, 1 mm, conical; ovules few; style 0.3 mm; stigmas 3, flat, spreading. Fruit a drupe, 4 mm across, globose, brownish-black; seed one, globose.

Ambalappara, NS & KJD 31951

Fl. & Fr.: January-May

Distribution: Common in Evergreen forests of Ambalappara.

SAPOTACEAE

- 1a. Stamens as many as the number of calyx lobes 2
- 1b. Stamens twice or more the number of calyx lobes 3
- 2a. Corolla lobes 5 or 6, uniseriate *Chrysophyllum*
- 2b. Corolla lobes 18 or 24, 2 or more seriate *Mimusops*
- 3a. Calyx lobes 6 *Palaquium*
- 3b. Calyx lobes 4 4
- 4a. Corolla lobes 4; stamens 8 *Isonandra*
- 4b. Corolla lobes 8 or 12; stamens more than 16 *Madhuca*

CHRYSOPHYLLUM L., Sp. Pl. 192. 1753.

Chrysophyllum cainito L., Sp. Pl. 192. 1753; Gamble, Fl. Pres. Madras 759(533). 1921; Manilal & Sivar., Fl. Calicut 156. 1982; Ansari, Fl. Kasaragod Div. 220. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 497. 2009.

Trees, to 25 m high; bark greyish to dark brownish-black, vertically shallowly cracked; young parts golden-ferruginous silky. Leaves simple, alternate, distichous, 5.5-14 x 2.5-7 cm, elliptic, elliptic-oblong, ovate or elliptic-ovate, apex obtusely acuminate or acuminate, base acute or obtuse, margin entire, glabrous and shining above, golden-ferruginous silky beneath, coriaceous; petiole 8-20 mm long, stout, grooved above, silky pubescent; lateral nerves 10-26 pairs, parallel, prominent, intercostae reticulate, faint. Flowers bisexual, white, 5-20 in axillary fascicles; pedicels 0.5-1.5 cm long, silky. Sepals 5, 1.5-2 mm long, coppery, ovate, silky outside. Corolla 3.5-4 mm long; tube equalling the length of the lobes; lobes 5, ovate, silky outside. Stamens 5, included; anthers extrorse. Ovary superior, silky, ovules many; style included. Fruit a berry, 2.5-3 x 1 cm, white to purplish-black; broadly ellipsoid to globose; seeds 3-10, laterally compressed.

Paripode, KVB 22572

Fl. & Fr.: July-September

Distribution: Cultivated near Farm.

ISONANDRA Wight, Ic. t. 359. 1840.

- 1a. Leaves oblong or oblong-lanceolate, caudate-acuminate, base cuneate... *I. lanceolata*
1b. Leaves elliptic, acute, base acute or rounded *I. perrottetiana*

Isonandra lanceolata Wight, Ic. t. 359. 1840; Hook. f., Fl. Brit. India 3: 539. 1882; Gamble, Fl. Pres. Madras 761(535). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 263. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 494. 2009. *Isonandra wightiana* A. DC. in DC., Prodr. 8: 187. 1844; Hook. f., Fl. Brit. India 3: 539. 1882. *Isonandra lanceolata* Wight var. *anfractuosa* Clarke in Hook.f., Fl. Brit. India 3: 539. 1882; Gamble, Fl. Pres. Madras 761(535). 1921. *Isonandra lanceolata* Wight forma *anfractuosa* (Clarke) Jeuken, Blumea 6: 560. 1952; Vajr., Fl. Palghat Dist. 266. 1990.

Trees, to 8 m high, bark thin, brown, cracked; exudation white; branchlets sympodial. Leaves simple, alternate or alternate spiral, 8-20 x 3-8 cm, elliptic, elliptic-oblong, lanceolate or oblanceolate, apex acuminate, base cuneate, margin entire, glabrous, chartaceous; petiole 7-15 mm, stout, pubescent when young; lateral nerves 8-13 pairs, pinnate, regular, prominent, raised beneath, slender, ascending; intercostae scalariform, prominent. Flowers bisexual, cream, in axillary, short pedicelled fascicles. Calyx lobes 4, 3 mm long, ovate-acute, hairy without. Corolla campanulate 2 mm long. Stamens 8, subequal, attached near the base of corolla; anther tip apiculate. Ovary 1 mm long, 4-celled, superior, brown hairy; style 2 mm long, subulate. Fruit a berry, 1.5 cm long, ellipsoid, orange-yellow.

Kattikkari, KVB 31567

Fl. & Fr.: August-October

Distribution: Fairly common in Evergreen forests of Kattikkari and Ambalappara.

Isonandra perrottetiana A. DC. in DC., Prodr. 8: 188. 1844; Hook. f., Fl. Brit. India 3: 539. 1882; Gamble, Fl. Pres. Madras 761(535). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 263. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 495. 2009. *Isonandra candolleana* Wight, Ic. t. 1220. 1850; Hook. f., Fl. Brit. India 3: 539. 1882; Gamble, Fl. Pres. Madras 761(535). 1921.

Trees, to 10 m high; bark smooth, brown; exudation milky. Leaves simple, alternate, spiral, 5-11 x 2.5-4 cm, elliptic, oblanceolate or obovate-oblong, apex obtuse, acuminate or obtusely acute, base acute, margin entire, recurved, glabrous, coriaceous; petiole 3-7 mm, stout, grooved above, glabrous; lateral nerves 10-12 pairs, pinnate, prominent, intercostae subscalariform. Flowers bisexual, dull-white, in sessile densely packed, axillary fascicles; pedicels 2 mm long, tomentose; bracts and bracteoles obtuse. Sepals 2+2, broadly ovate, very unequal, the exterior much larger, hairy and ciliate. Corolla deeply 4-partite; lobes obovate-oblong, emarginate, longer than the tube. Stamens 8, subequal, attached at the base of the corolla, 1-seriate; anthers oblong-lanceolate, black-hairy at tip; staminodes absent. Ovary superior, densely hairy, 4-celled; style subulate. Fruit a berry, 17 x 10 mm, obovoid, cuspidate, glabrous.

Kannadivechakunnu, KJD 25578

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Ambalappara and Kannadivechakunnu. Endemic to southern Western Ghats.

MADHUCA Hamilton ex J. F. Gmelin, Syst. Nat. 2: 773, 799. 1791.

Madhuca neriifolia (Moon) H. J. Lam, Bull. Jard. Bot. Buitenz. ser. 3, 7.182,265. 1925; Ansari, Fl. Kasaragod Div. 220. 1985; Ramach. & V.J. Nair, Fl. Cannanore

Dist. 264. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 496. 2009. *Bassia nerifolia* Moon, Cat. Pl. Ceylon 36. 1824. *Bassia malabarica* Bedd., For. Man. Bot. 140.1872; Hook. f., Fl. Brit. India 3:544.1882; Gamble, Fl. Pres. Madras 763(537). 1921.

Evergreen trees, to 15 m high, bark 6-8 mm thick, dark brown to grey, knotty, deeply fissured and peeling off in rectangular strips, 3 cm long, 2 cm wide; latex milky; young shoots glabrous. Leaves simple, alternate, crowded at the tip of branchlets, 8-15 x 2.5-5.5 cm, elliptic-lanceolate, linear-oblong, oblong-lanceolate, oblanceolate, elliptic-oblong or obovate, base acute or attenuate, apex obtuse or acute, margin entire, glabrous, coriaceous, glossy, slender; petiole 6-18 mm long, stout, grooved above, glabrous; lateral nerves 15-22 pairs, slender, parallel; intercostae reticulate, faint, slender. Flowers bisexual, yellowish-white, in axillary subterminal fascicles, 10-12 mm across, pedicels minutely tomentose, enlarges in fruit. Calyx tube ovate-acute, 0.7 x 0.5 cm, minutely tomentose. Corolla lobes 8-10, campanulate, 1.5-2 cm long, tomentose outside, except the margins. Stamens 16-20 in 2 rows, anthers linear, appendage 1 mm long, filaments short, villous; anthers lanceolate, long ciliate at base, connective produced. Ovary 0.5 cm long, oblong, superior, glabrous without, 6-8-celled; ovules 1 in each cell; style slender 2-2.5 cm long. Fruit a berry, 2-3 cm long, 1-1.5 cm wide ellipsoid, beaked; seed one, pale brown and shining, narrowly ellipsoid, 2.5 cm long, compressed, acute at both ends.

Kariyenkappu, *KVB 31290*

Fl. & Fr.: November-March

Distribution: Common along the River banks of Semi-evergreen forests at Valayamchal and Narikkadavu; Evergreen forests of Chavachi and Plantations of Kariyenkappu.

MIMUSOPS L., Sp. Pl. 349. 1753.

Mimusops elengi L., Sp. Pl. 349. 1753; Hook. f., Fl. Brit. India 3: 548. 1882; Gamble, Fl. Pres. Madras 765(538). 1921; Manilal & Sivar., Fl. Calicut 157. 1982; Ansari, Fl. Kasaragod Div. 221. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 496. 2009.

Evergreen trees, to 20 m high, bark dark grey, cracked or fissured longitudinally, scaly, rough; lenticels vertical; exudation milky; young branches brown pubescent. Leaves simple, alternate, spiral, 4-12 x 3.5-7.5 cm; elliptic or elliptic-oblong, apex obtuse to acuminate, base round or obtuse, margin entire, glabrous, coriaceous; stipules lanceolate, caducous; petiole 15-40 mm long, slender, grooved above, pubescent; lateral nerves many, slightly raised beneath, parallel, slender, looped near the margin forming intramarginal nerves; intercostae reticulate. Flowers bisexual, white, fragrant, 1-3 in axillary fascicles, pedicel 1 cm long. Calyx lobes 8 in 2 series of 4 each, thick, outer lanceolate, valvate, pubescent. Corolla 1 cm across; lobes 24, 3 series of 8 each, with hairs on back and margins, acuminate. Stamens 8, alternating with pilose staminodes; filaments 1 mm, anthers oblong, cordate, 3 mm, connectives apiculate; staminodes lanceolate, acuminate, fimbriate, pilose. Ovary 0.1-0.15 cm long, void, hirsute without, 6-8-celled; 1 ovule in each cell; style columnar, 5 mm; stigma minutely fimbriate. Fruit a berry, yellow, ovoid, 2.5 cm long, 1.5 cm across, fleshy, epicarp thin; seed usually 1, oblong-ellipsoid, laterally compressed.

Kariyenkappu, *KJD 26252*

Fl. & Fr.: December-August

Distribution: Earlier settlements.

PALAEQUIMUM Blanco, Fl. Filip. 403. 1837.

Palaquium ellipticum (Dalz.) Baill., Traite, Bot. Med. Phan. 1500. 1884; Gamble, Fl. Pres. Madras 764(537). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 264. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 497. 2009. *Bassia elliptica* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 36. 1851. *Dichopsis elliptica* (Dalz.) Benth. in Benth. & Hook. f., Gen. Pl. 2: 658. 1876; Hook. f., Fl. Brit. India 3: 542. 1882.

Evergreen trees, to 30 m high, bark 0.85 cm, dark brown mottled with white, trunk without branches for a considerable height; exudation milky; young parts minutely pubescent, branches glabrous, sympodial. Leaves simple, alternate, spiral, clustered towards the tip, 4-11 x 3-4.5 cm, elliptic, elliptic-obovate, apex obtusely acuminate, base acute, margin entire, glabrous above, glabrescent below, dark green above, pale yellow, coriaceous; petiole 12-25 mm long, slender, slightly pubescent; lateral nerves 7-12 pairs, pinnate, slender, prominent below; intercostae reticulate, slender. Flowers bisexual, white, fragrant, in axillary fascicles; pedicels 2.5 cm, pubescent. Calyx lobes 6 in 2 series, outer 3 valvate, inner 3 imbricate, densely villous, outer 3 ovate, inner 3 lanceolate. Corolla lobes 6, campanulate, tube shorter than lobes, lobes ovate-oblong. Stamens 12-20, extrorse; filaments short, hairy; anthers lanceolate, connective produced. Ovary tomentose, 6-celled, superior; style exserted, glabrous, subulate. Fruit a berry, 3-4 x 1.5 cm, fleshy, ellipsoid, smooth, green; seeds 1 or 2, large.

Way to Meenmutty, *KJD 26180*; Moonamthode *KVB 31540*

Fl. & Fr.: February-July

Distribution: Common in Evergreen forests of Meenmutty, Moonamthode, Chelachode, Chavachi and Kattikkari. Endemic to Western Ghats.

EBENACEAE

DIOSPYROS L., Gen. Pl. ed. 6. 550. 1764.

- 1a. Mature leaves and branchlets shaggy-tomentose..... 2
- 1b. Mature leaves and branchlets glabrous 3
- 2a. Leaves less than 1.5 cm broad; fruits glabrous..... *D. buxifolia*
- 2b. Leaves over 2.5 cm broad; fruit densely tomentose*D. pruriens*
- 3a. Calyx 5-lobed 4
- 3b. Calyx 4-lobed 5
- 4a. Fruit sessile or subsessile, calyx adnate to the fruit, woody *D. bourdillonii*
- 4b. Fruit pedicelled, calyx free from the fruit, foliaceous..... *D. paniculata*
- 5a. Corolla salver shaped; stamens 36.....*D. assimilis*
- 5b. Corolla campanulate or urceolate; stamens 12-20..... 6
- 6a. Young shoots, pedicels and calyx rufous tomentose *D. nilagirica*
- 6b. Young shoots, pedicels and calyx glabrescent, not rufous tomentose*D. ovalifolia*

Diospyros assimilis Bedd., Madras For. Rep. 20. t.1. 1866-1867; Hook. f., Fl. Brit. India 3: 558. 1882; Gamble, Fl. Pres. Madras 775(545). 1923; V. Singh, Monogr. Indian Diospyros 44. 2005.

Evergreen dioecious trees, to 20 m high, bark 4-6 mm thick, black, mottled with green and white, cracked; outer bark 1 mm thick, dark black, dead, inner bark 4-5 mm thick, brittle, yellowish-brown; branchlets thinly tomentose. Leaves simple, alternate, 7-17.5 x 3.5-6.5 cm, ovate, obovate, oblong, elliptic-oblong or elliptic-obovate, apex acuminate, base acute or unequally round, margin entire, glabrous, chartaceous; petiole 5-10 mm long, slender, glabrous; lateral nerves 4-7 pairs, lowest pair usually opposite,

pinnate, prominent, intercostae reticulate, prominent, pellucid. Flowers unisexual, pale yellow, sessile; male flowers 7-8 mm across, in dense axillary cymes; female flowers larger, solitary; peduncle 3-5 mm long, covered with imbricating bracts. Calyx 2 mm long, cupular, densely tomentose in female; lobes 4, ovate, obtuse, glabrous, margin ciliate, reflexed. Corolla 10 mm long, salver shaped, densely minutely tomentose; lobes 4, 6 x 4 mm, ovate, acute, tomentose outside. Stamens 36, in groups of 4; filaments glabrous, unequal; anthers shortly unequal, acute, connective thinly villous along the back. Ovary superior, 8-celled, ovule 1-in each cell. Fruit a berry, globose, green, smooth.

Chavachi, NS & KVB 31309

Fl. & Fr.: February-August

Distribution: Fairly common in Evergreen forests of Chavachi, Chelachode and Meenmutty. Endemic to Western Ghats.

Diospyros bourdillonii Brandis, Indian Trees 435. 1906; Gamble, Fl. Pres. Madras 777(546). 1923; V. Singh, Monogr. Indian Diospyros 54. 2005.

Evergreen dioecious trees, to 25 m high, bole fluted, buttressed; bark 6-8 mm thick, black, rough, brittle, flaking off in thin scales; young shoots strigose. Leaves simple, alternate, 7-17 x 2.5-8 cm, oblong, ovate-oblong, oblong-obovate or oblong-lanceolate, apex acuminate, base round or obtuse, margin entire, glabrous, coriaceous; drooping; petiole 5-10 mm long, stout, pubescent when young; lateral nerves 6-8 pairs, pinnate, prominent, intercostae scalariform, prominent. Flowers unisexual, white; male flowers in rusty tomentose axillary cymes, 10-12 mm long; pedicels 3 mm long. Female flowers in brown tomentose compound cymes from old wood; pedicels 5 mm long. Calyx 5-lobed, lobes 3 mm long, ovate, acute, brown tomentose. Corolla tube urceolate, hispid; lobes 5, white, orbicular, deflexed. Stamens 12-18, in 2 rows, equal; staminodes 10. Fruit a berry, 7.5 cm across, globose, dark green; persistent calyx cup-like, woody with short pointed lobes.

Chavachi, NS & KVB 31390

Fl. & Fr.: March-December

Distribution: Fairly common in Plantations of Kariyenkappu; Evergreen forests of Chavachi and Asthippara. Endemic to southern Western Ghats.

Diospyros buxifolia (Blume) Hiern, Trans. Cambridge Philos. Soc. 12: 218. 1873; V. Singh, Monogr. Indian Diospyros 56. 2005. *Leucoxyllum buxifolium* Blume, Bijdr. 1169. 1826. *Diospyros microphylla* Bedd., Ic. t. 133. 1868-1874; Hook. f., Fl. Brit. India 3: 559. 1882; Gamble, Fl. Pres. Madras 776(546). 1923.

Trees, to 30 m high, bole buttressed; bark 5-6 mm thick, blackish-grey, mottled with white, brittle; branchlets densely golden yellow hairy. Leaves simple, alternate, bifarious, 1-4.5 x 0.6-2 cm, elliptic-ovate, ovate, ovate-oblong or ovate-lanceolate, apex acute, base acute or cuneate, margin entire, coriaceous; petiole 2-3 mm, slender, hispid; glabrous above except midrib and pubescent beneath; lateral nerves 2-3 pairs, pinnate, faint, intercostae obscure. Flowers unisexual, white. Male flowers: 2-3 mm, 1-4 together in subsessile small axillary cymes; calyx densely fulvous-hairy outside; lobes 4, broadly outside; corolla campanulate, tube 0.1-0.15 cm long; lobes 4, orbicular, apiculate with a line of hairs on the back; stamens 16, in pairs, united by their filaments at base; anthers ovate, dehiscence by apical pores; pistillodes minute, hairy. Female flowers: 7-8 mm, solitary, subsessile; calyx

and corolla as in males; staminodes absent; ovary superior, ovoid, pubescent, 4-celled, ovule 1 in each cell; style short 2 partite. Fruit a berry, 15-18 x 10-12 mm, oblong, pointed, purple, glabrous; seeds 1-2, endosperm equable.

Kannadivechakunnu, *KJD 18792*

Fl. & Fr.: January-May

Distribution: Fairly common in Evergreen forests of Kannadivechakunnu.

Diospyros nilagirica Bedd., Ic. t. 136. 1868-1874; Hook. f., Fl. Brit. India 3: 566. 1882; Gamble, Fl. Pres. Madras 775(545). 1923; V. Singh, Monogr. Indian Diospyros 181. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 499. 2009.

Evergreen dioecious trees, to 18 m high, bark 10-12 mm thick, black, smooth; branchlets, young leaves and inflorescence densely rufous tomentose. Leaves simple, alternate, 5-15 x 2-4 cm, elliptic, oblong-lanceolate or ovate, apex acuminate, base attenuate, margin entire, reflexed, coriaceous, densely rufous tomentose when young, glabrous when mature; petiole 6-12 mm, slender, glabrous; lateral nerves 6-9 pairs, slender, pinnate, faint, intercostae reticulate, faint. Flowers unisexual, yellowish-white. Male flowers: 3-6, in axillary cymes, 10-12 mm long; calyx campanulate, deeply 4 lobed; lobes broadly ovate or orbicular, obtuse, densely fulvous hairy, margin strongly reflexed; corolla salver shaped; lobes 4, ovate, obtuse, hairy without, twisted; stamens 16, in pairs of unequal length; filaments of each pairs connate at base, villous; anthers lanceolate, apiculate; pistillode globose, densely hairy. Female flowers : solitary, axillary, sessile, calyx and corolla as in male flowers; staminodes 8, longer and shorter alternate with each other; filaments villous; anthers linear; ovary superior, sessile, globose, 8-celled, ovule 1 in each cell, densely hairy; styles 4, much reflexed; stigma dilated. Fruit a berry 2.5 x 2.5 cm, globose, green, glabrous, calyx not enlarged; seeds 12 x 7 mm, compressed; endosperm equable.

Ambalappara, *KVB 31714*; Asthipara, *KJD 26079*

Fl. & Fr.: February-May

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthipara. Endemic to southern Western Ghats.

Diospyros ovalifolia Wight, Ic. t. 1227. 1848; Hook. f., Fl. Brit. India 3: 559. 1882; Gamble, Fl. Pres. Madras 777(546). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 265. 1988; V. Singh, Monogr. Indian Diospyros 185. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 500. 2009.

Dioecious trees, to 20 m high, bark dark brown with superficial ridges; branchlets slender, sparsely, minutely adpressed-pilose apically. Leaves simple, alternate, 6.5-15 x 2-7 cm, elliptic, oblanceolate, obovate or obovate-oblong, apex subacute, obtuse or round, base cuneate or acute, margin entire, glabrous, coriaceous; petiole 7-15 mm long, stout, grooved above, glabrous; lateral nerves 5-8 pairs, pinnate, slender, prominent, intercostae reticulate, prominent. Flowers unisexual, yellowish-white, in short fascicles, usually in the axils of fallen leaves. Male flowers: calyx broadly campanulate, lobes 4-5, ovate, 3 mm, thick, appressed-hairy, margin ciliate, acute; corolla tubular-campanulate, thin fleshy; tube 4 mm long; lobes 4, ovate, acute, 1.5 mm long, twisted, spreading; stamens 14-20, paired, unequal. Female flowers: subsessile, 1 cm across; calyx broadly campanulate; lobes 4-5, 4 mm long, ovate, appressed hairy without, acute, margin ciliate; corolla tubular-campanulate, 4 mm long, thin fleshy; lobes 5, 3 mm long, ovate, subacute,

strongly reflexed; staminodes 4, spatulate, 4 mm long, sometimes lacking; ovary superior, 3 mm long, globose, appressed pubescent, 4-celled, ovule 1-in each cell; stigma 4-lobed, sessile. Fruit a berry, 1-2 cm across, pubescent when young, glabrous later; calyx strongly reflexed, tawny-pubescent; endosperm equable.

Pothurumi, *KVB 31732*

Fl. & Fr.: March-August

Distribution: Rare in Evergreen forests of Pothurumi.

Diospyros paniculata Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 109. 1852; Hook. f., Fl. Brit. India 3: 570. 1882; Gamble, Fl. Pres. Madras 775(544). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 265. 1988; V. Singh, Monogr. Indian Diospyros 189. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 500. 2009.

Dioecious trees, to 15 m high, bark 7-8 mm thick, smooth, black often with grey blotches; branchlets angular, pubescent. Leaves simple, alternate, 12-20 x 4-7 cm, oblong or oblong-lanceolate, base acute, round or cuneate, apex acute, acuminate or obtusely acuminate, margin entire, reflexed near the base, glabrous, coriaceous; petiole 7-10 mm long, stout, wrinkled, puberulent when young; lateral nerves 6-9 pairs, pinnate, prominent, intercostae reticulate, surface finely reticulate. Flowers unisexual, greenish-yellow. Male flowers: 3-5 together in short paniced cymes with a pair of ovate-cordate bracts; bracts 1 x 0.8 cm, pubescent; calyx 10 x 12 mm, globose, 5-angled, minutely hispid, deeply lobed; lobes-5, ovate-obtuse, margin reflexed, prominently veined, pubescent; corolla dull or creamy white, tube 12 mm long, pentagonal, narrowed above, hispid; lobes 5, 8 x 4 mm, oblong; stamens 16-20 in pairs, equal; anthers linear, acute; pistillode absent. Female flowers; solitary, axillary; pedicel to 2 cm long; bracts larger than those of the male flowers; calyx glabrescent; staminodes 10; ovary superior, 4-celled, ovule 1 in each cell, tomentose; stigma 4, unequal. Fruit a berry, 3-4 x 2-3 cm, ovoid to obovoid, obtuse, obtusely 5-angled, yellowish-brown, puberulous; calyx 1.5 x 3 cm, saccate; seeds few, 2 x 0.8 cm.

Meenmutty, *KVB 31509*

Fl. & Fr.: January-April

Distribution: Common in Evergreen forests of Chavachi, Kurumbankallu and Meenmutty; plantations of Kariyenkappu and Semi-evergreen forests of Pothanplavu and Paripode. Endemic to Peninsular India.

Diospyros pruriens Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 4: 110. 1852; Hook. f., Fl. Brit. India 3: 553. 1882; Gamble, Fl. Pres. Madras 774(544). 1923; Ansari, Fl. Kasaragod Div. 222. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 265. 1988; V. Singh, Monogr. Indian Diospyros 207. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 501. 2009.

Dioecious trees, to 10 m high, bark black, scurfy scaly; branchlets densely hirsute-pubescent. Leaves simple, alternate, 6-16 x 2-5 cm, elliptic or elliptic-oblong or oblong-lanceolate, apex acute or obtusely acuminate, base round or subcordate, margin entire, fulvous-hirsute, often glabrescent above except midrib, membranous; petiole 3-5 mm long, stout, hirsute; lateral nerves 7-12 pairs, pinnate, slender, prominent, secondary laterals present, intercostae reticulate, prominent. Flowers unisexual, yellowish-white. Male flowers: 1-2 flowered axillary cymes, close together in the upper axils; pedicels articulated at base; bracts small, ovate, cauducous, glabrous inside; calyx 6.35 mm long, divided nearly to the base, fulvous hairy, lobes 4, linear-oblong; corolla 12.7-

19.05 mm long, silky hairy outside; lobes 4, ovate-oblong, obtuse, about as long as the tube; stamens 12-14, unequal, glabrous, connate at the base, shorter than the corolla tube; anthers as long as the filaments; pistillode densely hairy. Female flowers: solitary, crowded in the upper axils; calyx 6.35 mm long, 4 partite; lobes oblong, spreading, hairy; corolla 9.52-12.7 mm long, 4-fid, constricted about the middle; staminodes 4, small; ovary superior, fulvous-hairy, 4-celled, ovule 1 in each cell; style 2, short, almost concealed by the hairs on the ovary, bifid at the apex. Fruit a berry 2.5 cm long, ovoid-conical, clothed with yellow stinging hairs, supported by the persistent, deflexed, slightly enlarged calyx lobes; endosperm equable.

Kattikkari, KVB 31568

Fl. & Fr.: March-August

Distribution: Fairly common in Evergreen forests of Kattikkari and Moonamthode. Endemic to Western Ghats.

SYMPLOCACEAE

SYMPLOCOS Jacq., Enum. Pl. Carib. 5: 24. 1760.

- 1a. Fruit ampulliform..... *S. cochinchinensis* ssp. *laurina*
- 1b. Fruit not ampulliform 2
- 2a. Shrubs *S. wynadense*
- 2b. Trees 3
- 3a. Inflorescence branched *S. racemosa*
- 3b. Inflorescence unbranched 4
- 4a. Fruit hairy when mature *S. macrophylla* ssp. *macrophylla*
- 4b. Fruit glabrous when mature..... *S. foliosa*

Symplocos cochinchinensis (Lour.) Moore **ssp. laurina** (Retz.) Nooteb., Rev. Symplocac. 156. 1975 & in Dassan & Fosb., Rev. Handb. Fl. Ceylon 3: 458. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 266. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 503. 2009. *Myrtus laurina* Retz., Obs. Bot. 4: 26. 1786. *Drupatris cochinchinensis* Lour., Fl. Cochinch. 314. 1790. *Symplocos spicata* Roxb., Fl. Ind. 2: 542. 1832; Hook. f., Fl. Brit. India 3: 573. 1882. *Symplocos spicata* Roxb. var. *laurina* (Retz.) Clarke in Hook. f., Fl. Brit. India 3: 573. 1882; Gamble, Fl. Pres. Madras 782(549). 1921. *Symplocos spicata* Roxb. var. *malasica* Clarke in Hook. f., Fl. Brit. India 3: 573. 1882. *Symplocos spicata* Roxb. var. *attenuata* (A.DC.) Clarke in Hook. f., Fl. Brit. India 3: 573. 1882. *Symplocos laurina* (Retz.) Wall. ex G. Don, Gen. Hist. 4: 3. 1837-1838.

Evergreen trees, to 15 m high, bark light grey, thin, smooth. Leaves simple, alternate, 5.5-15 x 2.5-6 cm, elliptic, elliptic-lanceolate or elliptic-oblong, apex acute or acuminate, base acute to attenuate, margin crenate-serrate, revolute, glabrous, yellow when dry, coriaceous or chartaceous; petiole 6-15 mm, slender, glabrous, grooved above; lateral nerves 7-8 pairs, pinnate, slender, glabrous; intercostae reticulate, faint. Flowers bisexual, white, in axillary simple or branched spikes, 7 cm long, pubescent; bracts solitary at the base of each pedicel; bracteoles early cauducous. Calyx tube adnate to the ovary, lobes 5, minute, lobes 1 mm, triangular. Corolla 1 cm across, lobes 5, ovate, 3 mm, recurved. Stamens many, equal, arranged in 5 group. Ovary 1 mm, inferior, globose 2-3-celled; ovules 2 in each cell, pendulous from the inner angle; style 5 mm, simple; stigma capitate. Fruit a drupe, 8 mm across,

glabrous, ampulliform, globose ribbed, purple crowned by calyx lobes; seeds 1-3, oblong.

Ambalappara, *KVB 31637*

Fl. & Fr.: March-May

Distribution: Fairly Common in Evergreen forests of Ambalappara and Meenmutty.

Symplocos foliosa Wight, Ic. t. 1234. 1848; Hook. f., Fl. Brit. India 3: 582. 1882; Gamble, Fl. Pres. Madras 783(550). 1921; Ramach. & V.J. Nair, Fl. Cannanore Dist. 267. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 503. 2009. *Symplocos nervosa* Wight, Ic. t. 1235. 1848, non DC. 1844.

Trees, to 6 m high; branchlets fulvous tomentose, glabrous when mature. Leaves simple, alternate, 6-12 x 2-5 cm, elliptic or oblong, apex acuminate, base acute, margin serrate, glabrous, coriaceous; petiole 5-20 mm, long, stout, tomentose, grooved above; lateral nerves 8-12 pairs, pinnate, glabrous, prominent, midrib beneath hispid; intercostae reticulate, prominent. Flowers bisexual, white; spikes unbranched, densely fulvous tomentose; bracts 4-6 x 2-2.5 mm, cauducous, brown tomentose; bracteoles early cauducous. Calyx tube adnate to the ovary, lobes 5, lobes 2-3 mm long, ovate, pubescent, tube 2-2.5 mm. Corolla lobes 5, 3.5-4 mm long, orbicular, ciliate. Stamens 30-40, unequal, many seriate, adnate to the corolla tube; anthers short. Ovary 2-2.5 mm long, inferior; ovules 2-3 in each cell, pendulous from the inner angle; style filiform; stigma capitate. Fruit a drupe, 10 x 5 mm, ovoid, yellow.

Ambalappara, *KVB 31776*

Fl. & Fr.: November-February

Distribution: Rare in Evergreen forests of Ambalappara, Kattikkari and Mullenpara. Endemic to Southern Western Ghats.

Symplocos macrophylla Wall. ex A. DC in DC., Prodr. 8: 257. 1844, ssp. **macrophylla**; Hook. f., Fl. Brit. India 3: 578. 1882. *Symplocos gardneriana* Wight, Ic. t. 1231. 1848; Hook. f., Fl. Brit. India 3: 582. 1882; Gamble, Fl. Pres. Madras 782(550). 1921.

Trees, to 7 m high; young branches rusty tomentose. Leaves simple, alternate, 7.5-15 x 3.5-7.5 cm, elliptic, elliptic-ovate, base acute or rounded, apex acute to acuminate, margin crenulate, recurved when old, glabrous above, rusty villous beneath, coriaceous, yellow when dry; petiole 10-20 mm, stout, tomentose; lateral nerves 10-12 pairs, prominent, pinnate, villous, midrib raised beneath; intercostae reticulate, prominent. Flowers bisexual, white, 0.85cm across, sessile, in axillary spike, 5cm, densely rusty villous; bracts small. Calyx tube adnate to the ovary, lobes 5, ovate, acute villous. Corolla deeply 5-lobed. Stamens numerous, many seriate, adnate to the corolla tube; anthers short. Ovary inferior; ovules 2 in each cells, pendulous; stigma slightly lobed. Fruit a drupe, 1.2cm long, cylindrical densely hairy, purple.

Kattikkari State Boundary, *KJD 26013*

Fl. & Fr.: February-May

Distribution: Rare in Evergreen forests of Kattikkari. Endemic to southern Western Ghats.

Symplocos racemosa Roxb., Fl. Ind. 2: 539. 1832; Hook. f., Fl. Brit. India 3: 576. 1882; Ramach. & V.J. Nair, Fl. Cannanore Dist. 269. 1988; Ratheesh

Narayanan, Fl. Stud. Wayanad Dist. 505. 2009. *Symplocos beddomei* Clarke in Hook. f., Fl. Brit. India 3: 582. 1882; Gamble, Fl. Pres. Madras 783(551). 1921. *Symplocos candolleana* Brand. in Engl., Pflanzenreich Symploc. 49. 1901; Gamble, Fl. Pres. Madras 782(549). 1921.

Trees, to 10 m high, bark 1 cm thick, greyish, smooth; branchlets glabrous. Leaves simple, alternate, 7-15 x 3-6 cm, elliptic or elliptic-obovate, apex acute to acuminate, base acute, margin crenate-serrate, recurved, glabrous, shiny, coriaceous; petiole 6-15 mm long, slender, glabrous, grooved above; lateral nerves 6-12 pairs, glabrous, pinnate, slender; intercostae reticulate, prominent. Flowers bisexual, in spikes, to 12 cm long, fulvous tomentose, many flowered; bracts ovate, cauducous; bracteoles early cauducous. Calyx tube adnate to the ovary, lobes 5, triangular, acute, glabrous. Corolla deeply 5-lobed. Stamens numerous, unequal, many seriate, adnate to the corolla tube; anthers short. Ovary inferior, ovules 2-3 in each cell, pendulous from the inner angle; style filiform. Fruit a drupe 15 x 5 mm, ovoid, glabrous, shallowly furrowed, yellow, stone woody; seeds 1-2, oblong.

Ambalappara, NS & KJD 25508

Fl. & Fr.: May-October

Distribution: Fairly common in Evergreen forests of Ambalappara.

Symplocos wynadense (O. Ktze.) Nooteb., Rev. Symplocac. 293. 1975; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 505. 2009. *Eugeniodes wynadense* O. Ktze., Rev. Gen. Pl. 2: 975. 1891. *Symplocos acuminata* Bedd., For. Man. Bot. 150. 1872. & Ic. t. 117. 1868-74, non Miq. 1859; Hook. f., Fl. Brit. India 3: 583. 1882; Gamble, Fl. Pres. Madras 783(550). 1921.

Small trees or large shrubs; branchlets glabrous. Leaves simple, alternate, 8-11 x 4 cm, elliptic, acuminate at apex, rounded or acute at base, crenate-serrate, glabrous, nerves 5-7 pairs, slender; petiole 1 cm long, glabrous. Spikes axillary, to 6 cm long, unbranched; peduncle slender, densely hairy. Flowers few; pedicels 5 mm long. Calyx lobes ovate, obtuse, densely hairy. Corolla white, 8 mm across, lobes oblong, acute, glabrous. Stamens numerous, free; style 5 mm long, hairy. Drupe to 1 cm long, glabrous, blue.

Ambalappara, KVB 31574

Fl. & Fr.: January-November

Distribution: Common in Evergreen forests of Kattikkari, Mullenpara and Ambalappara. Endemic to southern Western Ghats.

OLEACEAE

- 1a. Climbers..... 2
- 1b. Trees or shrubs..... 3
- 2a. Stem quadrangular, leaves 3-ribbed from base Myxopyrum
- 2b. Stem terete, leaves penni-nerverd..... Jasminum
- 3a. Petals united in pairs Chionanthus
- 3b. Petals united at base in to tube 5
- 4a. Flowers polygamous, panicle axillary..... Olea
- 4b. Flowers all bisexuals, panicle terminal Ligustrum

CHIONANTHUS L., Sp. Pl. 8. 1753.

Chionanthus mala-elengi (Dennst.) P. S. Green ssp. **mala-elengi**, Bull. Bot. Surv. India 26. 124. 1984; Ramach. & V.J. Nair, Fl. Cannanore Dist. 269. 1988; Srivastava & Kapoor, Journ. Econ. Tax. Bot. 15: 133. 1991; P. S. Green, Kew Bull. 58: 264. 2003; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 507.

2009. *Forsythia mala-elengi* Dennst., Schluss. Hort. Malab. 12,21, 31. 1818. *Linociera malabarica* Wall. ex G. Don, Gen. Hist. 4: 53. 1837-1838; Hook. f., Fl. Brit. India 3: 607. 1882; Gamble, Fl. Pres. Madras 794(558). 1923; Manilal & Sivar., Fl. Calicut 158. 1982; Ansari, Fl. Kasaragod Div. 223. 1985. *Chionanthus malabaricus* (Wall. ex G. Don) Bedd., Fl. Sylv. t. 239. 1872.

Trees, to 12 m high, bark greyish-brown, covered with warty lenticels; branchlets thinly tomentose. Leaves simple, opposite, 5-10 x 2.5-5.5 cm, obovate or elliptic-oblong, apex obtuse or suddenly narrowed to a small blunt acumen, base cuneate, margin entire, glabrous, glaucous beneath, coriaceous; petiole 4-10 mm, stout, glabrous, grooved above; lateral nerves 9-13 pairs, slender, pinnate; intercostae reticulate, faint. Flowers bisexual, yellowish-white, sessile, 6 mm long, in axillary clusters; peduncle 1.5 cm long. Calyx lobes 1.5 mm, ovate, obtuse, grey-pubescent. Corolla 7 mm long, lobes attached in pairs, linear acuminate, glabrous. Stamens 2, anthers sessile. Ovary densely hairy, stigma shortly bifid. Fruit a drupe, 10 x 5 mm, ellipsoid, slightly curved, acute, ridged.

Kariyenkappu, KVB 31210; NS & KJD 31994

Fl. & Fr.: December-April

Distribution: Common in Plantations of Kariyenkappu; Semi-evergreen forests of Pothanplavu and Paripode. Endemic to Peninsular India.

JASMINUM L., Sp. Pl. 8. 1753.

- 1a. Leaves simple *J. coarctatum*
1b. Leaves trifoliate..... *J. flexile* var. *flexile*

Jasminum coarctatum Roxb., Fl. Ind. 1: 91. 1820; P. S. Green, Kew Bull. 58: 289. 2003; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 508. 2009. *Jasminum rottlerianum* Wall. ex A. DC. in DC., Prodr. 8: 305. 1844; Hook. f., Fl. Brit. India 3: 593. 1882; Gamble, Fl. Pres. Madras 789(555). 1923; Ansari, Fl. Kasaragod Div. 224. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 272. 1988; Seema & Narayanan, Journ. Econ. Tax. Bot. 26: 129. 2002. *Jasminum rottlerianum* Wall. ex A. DC. var. *glabrior* Clarke in Hook.f., Fl. Brit. India 3:593. 1882; Manilal, Fl. Silent Valley 171. 1988.

Climbing shrubs, pubescent or twany villous. Leaves simple, opposite, to 10 x 5 cm, ovate-lanceolate, apex acute to acuminate, villous or subglabrous; petiole 1 cm, pubescent. Cymes terminal and axillary, bracts ovate, bracteoles linear, tomentose. Calyx tube 2 mm, 7-lobed, 5 mm, linear, curled, pubescent. Corolla white, tube 2.5 cm long, lobes 5-7, oblong, obtuse, twisted, 1.5 cm. Ovary 1 mm across; style 7 mm, stigma clavate. Fruit didymous, subglobose, 1 cm across, purple.

Chavachi, NS & KVB 31315

Fl. & Fr.: January-June

Distribution: Common in Evergreen forests of Chavachi; Semi-evergreen forests of Paripode and plantation of Kariyenkappu.

Jasminum flexile Vahl, Symb. Bot. 3: 1. 1794 & Enum. Pl. 1: 31. 1804, var. **flexile**; Hook. f., Fl. Brit. India 3: 601. 1882; Gamble, Fl. Pres. Madras 791(555). 1923; P. S. Green, Kew Bull. 58: 280. 2003; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 510. 2009. *Jasminum azoricum* sensu Mohanan, Fl. Quilon Dist. 248. 1984, non Burm. f., 1768; Ramach. & V.J. Nair, Fl. Cannanore Dist. 270. 1988. *Jasminum flexile* Vahl var. *travancorensis* Gamble, Fl. Pres. Madras 791(556). 1921. *Jasminum azoricum* L. var. *travancorensis*

(Gamble) Mohanan, Journ. Econ. Tax. Bot. 6: 480. 1985; Mohanan & Sivad., Fl. Agasthyamala 429. 2002.

Climbing shrubs; stem glabrous. Leaves trifoliate, leaflets subequal, to 10 x 5 cm, ovate-lanceolate, apex acuminate, base rounded, glabrous, acumen curved; lateral nerves 7 pairs; petiolules unequal, middle petiolulate to 2.5 cm long, laterals smaller. Cymes to 15 cm long, terminal, corymbose, peduncled; bracts and bracteoles minute, subulate. Flowers many; pedicels 1.5 cm long. Calyx 3 mm long, truncate, glabrous. Corolla white with pink tinge, tube 3 cm long, lobes, 5 or 6, 13 x 6 mm, oblong, obtuse. Berry 10 x 5 mm, oblique-obovoid, black, glabrous.

Pothurumi, NS & KVB 31380

Fl. & Fr.: October-March

Distribution: Common in Evergreen forests of Pothurumi, Kurumbankallu and Chavachi; Semi-evergreen forests of Paripode and plantations of Kariyenkappu.

LIGUSTRUM L., Sp. Pl. 7. 1753.

Ligustrum robustum (Roxb.) Blume **ssp. walkeri** (Decne.) P. S. Green, Kew Bull. 40: 130. 1985 & Rev. Handb. Fl. Ceylon 270. 1987; Ramach. & V.J. Nair, Fl. Cannanore Dist. 272. 1988; Srivastava, Journ. Econ. Tax. Bot. 22: 625. 1998; P. S. Green, Kew Bull. 58: 267. 2003; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 512. 2009. *Ligustrum walkeri* Decne., Nouv. Arch. Mus. Hist. Nat. Paris 2: 27. 1879; Hook. f., Fl. Brit. India 3: 614. 1882; Gamble, Fl. Pres. Madras 797(560). 1923.

Large shrubs or small trees; branchlets with elliptical lenticels. Leaves simple, opposite, 6-10 x 4-5 cm, ovate, acute, punctate; nerves indistinct; petiole 1 cm long. Panicle loose, branches puberulus; flowers distant; pedicel 2 mm long. Calyx tube 2 mm long, 5-toothed. Corolla 5 mm long; lobes longer than the tube, ovate, obtuse, white. Ovary truncate at apex; stigma spatulate. Berry 7 mm long, obovoid.

Ambalappara, KVB 31795

Fl. & Fr.: May-July

Distribution: Fairly common in Evergreen forests of Ambalappara.

MYXOPYRUM Blume, Bijdr. 683. 1825.

Myxopyrum smilacifolium (Wall.) Blume, Mus. Bot. Ludg.-Bat. 1: 320. 1851; Hook. f., Fl. Brit. India 3: 618. 1882; Kiew, Blumea 29: 509. 1984; P. S. Green, Kew Bull. 58: 273. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 512. 2009. *Chionanthus smilacifolia* Wall. in Roxb., Fl. Ind. 1: 108. 1820. *Myxopyrum serratum* Hill., Bull. Misc. Inform. Kew 1910: 41. 1910; Gamble, Fl. Pres. Madras 798(561). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 272. 1988.

Twining shrubs; branches 4-angular. Leaves simple, opposite, 7-13 x 3-5 cm, elliptic-ovate or oblong, base rounded to subcordate, margins serrulate from the middle towards apex, apex acuminate, basally 5-nerved, subcoriaceous; petiole to 1.2 cm long. Flowers in axillary trichotomous short panicles, 4-merous, bisexual. Calyx 1-1.5 cm long, lobes 4. Corolla yellowish, tube 1-2 mm long; lobes 4. Stamens 2, included. Ovary 2-locular; ovules 1-2 per locule; stigma 2-lobed. Berry 1-1.5 cm across, globose, black; seeds 2.

Kariyenkappu, KJD 26258

Fl. & Fr.: February-August

Distribution: Fairly common in Plantations of Kariyenkappu and Semi-evergreen forests of Pothanplavu.

OLEA L., Sp. Pl. 8. 1753.

Olea dioica Roxb., Fl. Ind. 1: 105. 1820; Hook. f., Fl. Brit. India 3: 612. 1882; Gamble, Fl. Pres. Madras 796(559). 1923; Manilal & Sivar., Fl. Calicut 158. 1982; Ansari, Fl. Kasaragod Div. 224. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 273. 1988; P. S. Green, Kew Bull. 58: 259. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 513. 2009.

Trees, to 15 m high, bark grey or brown, rough, shallowly vertically grooved. Leaves simple, opposite, 6-14.5 x 3-6 cm, elliptic, elliptic-oblong or elliptic lanceolate, apex acute to acuminate, base acute, margin serrate or entire, glabrous, punctate, pink when young, coriaceous; petiole 7-10 mm, slender, glabrous, grooved above; lateral nerves 8-12 pairs, pinnate, slender, glabrous; intercostae obscure. Flowers polygamo-dioecious, creamy-white, small, in panicles, axillary or from leafless nodes, pedicellate, 4 mm long, male panicles larger and denser than hermaphrodite. Calyx 1 mm, 4 teathed, campanulate, obtuse, ciliate. Corolla 2.5 mm long, lobes 4, shorter than the tube, triangular, obtuse, hairy within. Stamens 2, included, anthers sessile, 1 mm. Ovary 1.2 mm, 2-celled, superior, 4 ovuled; style 0.7 mm, short; stigma capitate. Fruit a drupe, 8 x 6 mm, ellipsoid, blue; seeds 6 x 4 mm, minutely muriculate.

Meenmutty, KVB 31507

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Meenmutty, Semi-evergreen forests of Paripode and Plantations at 55 Block. Endemic to India.

APOCYNACEAE

- 1a. Erect herbs, shrubs or trees 3
- 1b. Climbers..... 2
- 2a. Flowers large, 8 cm or more across..... Chonemorpha
- 2b. Flowers small 1.5 cm across..... Ichnocarpus
- 3a. Plants armed Carissa
- 3b. Plants unarmed 4
- 4a. Leaves 3 or more at each node, whorled 5
- 4b. Leaves 2 at each node 6
- 5a. Trees, fruits follicles Alstonia
- 5b. Herbs or shrubs, fruits drupes or capsules..... Rauvolfia
- 6a. Herbs Catharanthus
- 6b. Shrubs or trees..... 8
- 7a. Fruit capsule, seeds arillateTabernaemontana
- 7b. Fruit follicle, seeds not arillate 9
- 8a. Mouth of corolla tube with lobbed corona Wrightia
- 8b. Mouth of corolla with out corona Holarrhena

ALSTONIA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 75. 1811, *nom. cons.*

Alstonia scholaris (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; Hook. f., Fl. Brit. India 3: 642. 1882; Gamble, Fl. Pres. Madras 810(569). 1923; Manilal & Sivar., Fl. Calicut 164. 1982; Ansari, Fl. Kasaragod Div. 226. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 274. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 515. 2009. *Echites scholaris* L., Mant. Pl. 1: 53.1767.

Large trees; height to 30 m; bark 10-15 mm thick, surface grey-brown, irregularly cracked and shallowly fissured, subverrucose, lenticellate; latex

milky white; branchlets whorled. Leaves simple, whorled, 5-20 x 3-7 cm, obovate, oblanceolate or obovate-oblong; apex obtuse or emarginated, base cuneate or attenuate, margin entire, glabrous, subcoriaceous; petiole 5-12 mm long, stout, glabrous; lateral nerves many, slender, prominent, glabrous, parallel, looped near the margin forming intramarginal nerves; intercostae reticulate, obscure. Flower bisexual, 10-12 mm long, greenish-white in terminal umbellate cymes. Calyx cupular, lobes 5, ovate, unequal, obtuse, puberulous, eglandular. Corolla salver shaped, 4 mm across, lobes 5, obovate to orbicular, creamy yellow, spreading. Stamens 5, included; anthers narrowly cordate; disc obscure. Carpels 2, free, ovules many; style filiform; stigma obconic. Fruit of two linear, narrow, pendulous follicular mericarps, green, 30-40 cm long; seeds 5-6 mm long, flat, commate at both ends.

Kariyenkappu, *KJD 18730*

Fl. & Fr.: October-February

Distribution: Fairly common in Plantations of Kariyenkappu.

CARISSA L., Syst. Nat. ed. 12, 2: 189. 1767. *nom. cons.*

Carissa inermis Vahl, Symb. Bot. 3: 43. 1794; Gamble, Fl. Pres. Madras 805(565). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 275. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 517. 2009. *Carissa macrophylla* Wall. ex A. DC. in DC., Prodr. 8:332. 1844; Hook. f., Fl. Brit. India 3:691. 1882.

Climbing shrubs, thorns 1-3 cm long. Leaves opposite, 5-8 x 3-4 cm, ovate, apex acuminate, base rounded, glabrous; lateral nerves 6 or 7 pairs; petiole 5 mm long. Flowers in sessile or peduncled terminal cymes; pedicel 3 mm long, stout. Sepals 4 mm long, lanceolate, reddish, pubescent. Corolla white, tube 2 cm long, cylindrical, curved, bulged towards the apex, lobes 9 mm long, oblong, acute. Anthers lanceolate, inserted near the mouth of the corolla tube. Carpels united, ovules 1-4 in each. Berry 2 cm across, globose; seeds compressed.

Mullenpara, State Boundary, *KJD 18761*

Fl. & Fr.: January-June

Distribution: Rare in Evergreen forests of Mullenpara.

CATHARANTHUS G. Don, Gen. Hist. 4: 71, 95. 1837.

Catharanthus roseus (L.) G. Don, Gen. Hist. 4: 95. 1837-1838; Manilal & Sivar., Fl. Calicut 165. 1982; Ansari, Fl. Kasaragod Div. 227. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 276. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 526. 2009. *Vinca rosea* L., Syst. (ed. 10): 944. 1759; Hook. f., Fl. Brit. India 3: 640. 1882. *Lochnera rosea* (L.) Rchb., Consp. Reg. Veg. 134. 1828.

Perennial woody herbs; young stems, leaves and calyx puberulous. Leaves simple, opposite, decussate, 3-6 x 1.5-2.5 cm, elliptic-obovate, apex obtuse or rounded, base cuneate, glabrous; lateral veins c. 10 pairs, chartaceous; petiole to 1.3 cm long. Flowers axillary, solitary or paired, shortly pedicellate. Calyx lobes 5, subequal, 3-5 mm long, subulate. Corolla pink or white, tube 2-3 cm long, pubescent without; lobes 5, 1.5-2 x c. 1.5 cm, triangular-obovate,

obtuse. Stamens 5, included. Ovary ca 4 mm long; style to 3 cm long. Follicles 2-3 x 0.2-0.3 cm, linear, puberulous; seeds many, black.

Kariyenkappu, *KJD 18765*

Fl. & Fr.: August-February

Distribution: In old settlements at Kariyenkappu.

CHONEMORPHA G. Don, Gen. Syst. 4: 76. 1836, *nom. cons.*

Chonemorpha fragrans (Moon) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 203. 1929; Manilal & Sivar., Fl. Calicut 162. 1982. *Echites fragrans* Moon, Cat. Pl. Ceylon 20.1824. *Echites grandiflora* Roth, Nov. Pl. Sp. 136. 1821. *Echites macrophylla* Roxb., Fl. Ind. 2:13.1832. *Chonemorpha macrophylla* (Roxb.) G. Don, Gen. Hist. 4: 76. 1837-1838; Hook. f., Fl. Brit. India 3: 661. 1882; Gamble, Fl. Pres. Madras 818(575). 1923. *Chonemorpha grandiflora* (Roth) M. R. & S. M. Almeida, Journ. Bombay Nat. Hist. Soc. 90: 427. 1993; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 519. 2009.

Woody climbers, branchlets tomentose. Leaves simple, opposite, 20-25 x 15-22 cm, broadly elliptic or ovate-orbicular, apex shortly acuminate, base cordate, pubescent above and tomentose beneath. Flowers 6-8 cm across, white, in terminal tomentose paniculate cymes. Calyx 1 cm long, glabrous, glandular within; lobes ovate, acute. Corolla fairly large, salver shaped, lobes longer than the tube, obovate, cuneate, rounded at apex. Stamens included, anthers lanceolate, sagitate. Disc cupular. Carpels distinct, ovules many, stigma bifid. Follicles to 30 x 2 cm, subtetragonous; seeds 2 cm long, coma 4.5 cm long, white.

Narikkadavu, *NS & KVB 31444*

Fl. & Fr.: April-December

Distribution: Common in Semi-evergreen forests of Narikkadavu, Pookundu and Paripode.

HOLARRHENA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 62. 1811.

Holarrhena pubescens (Buch.-Ham.) Wall. ex G. Don, Gen. Hist. 4: 78. 1837-1838; Ansari, Fl. Kasaragod Div. 227. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 277. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 519. 2009. *Echites pubescens* Buch.-Ham., Trans. Linn. Soc. London 13: 521. 1821. *Echites antidysenterica* Roth in Roem. & Schult., Syst. Veg. 4: 394. 1819, non (L.) Roxb. ex Flem. 1810. *Holarrhena antidysenterica* (Roth) A. DC. in DC., Prodr. 8: 413. 1844; Hook. f., Fl. Brit. India 3: 644. 1882; Gamble, Fl. Pres. Madras 811(570). 1923; Manilal & Sivar., Fl. Calicut 165. 1982. *Holarrhena malaccensis* Wight, Ic. t. 1298. 1848.

Small deciduous trees; to 8 m high; bark rough, pale brown, to 8 mm, exfoliates in small flakes; latex milky white. Leaves simple, opposite, 7-18 x 3-12 cm, broadly ovate, ovate-oblong or ovate-lanceolate, apex acute or acuminate, base obtuse, margin entire, glabrous or puberulent beneath, membranous; petiole 4-6 mm, pubescent, stout; lateral nerves 10-14 pairs, prominent, arched, puberulous; intercostae reticulate. Flowers bisexual, creamy-white, slightly fragrant, in terminal and axillary corymbose cymes, appear along with new leaves. Calyx lobes 5, 2.5 mm long, oblong-lanceolate, ciliate, glandular within at base. Corolla salver shaped, lobes 5, oblong, obtuse, as long as the tube, tube 1.3 cm long, puberulous, mouth with a ring of hairs. Stamens 5, included, attached towards the base of the corolla tube, anthers sagitate; disc absent. Carpels 2, apocarpous; ovules many in each

carpel, style 2 mm long; stigma fusiform, bifid. Fruit of 2 terete elongated follicular mericarps connected at the tip and then free, 25 x 1 cm; seeds 8 mm, oblong, with tuft of silky brown hairs at the apex.

Paripode, *KJD 26397*

Fl. & Fr.: April-October

Distribution: Rare in Moist deciduous forests and plantations.

ICHNOCARPUS R. Br., Mem. Wern. Nat. Hist. Soc. 1: 61. 1811.

Ichnocarpus frutescens (L.) R. Br. in Ait. f., Hort. Kew. (ed. 2) 2: 69. 1811; Hook. f., Fl. Brit. India 3: 669. 1882; Gamble, Fl. Pres. Madras 820(577). 1923; Manilal & Sivar., Fl. Calicut 162. 1982; Ansari, Fl. Kasaragod Div. 228. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 278. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 521. 2009. *Apocynum frutescens* L., Sp. Pl. 213. 1753.

Climbers, branchlets brown-tomentose. Leaves simple, opposite, 4-6 x 3 cm, ovate, apex obtusely acute, base rounded, nerves 5 pairs, brown-pubescent below; petiole to 5 mm long. Flowers 3.5 mm long, in terminal or axillary paniced cymes; pedicels 3 mm long. Calyx 1 mm long, lobes ovate, acute, pubescent. Corolla white, salver shaped, contracted at mouth, tube 2 mm long, hairy inside, throat densely white-villous, lobes twisted, oblong, acuminate. Stamens included, anthers deeply sagittate at base, apiculate at apex. Carpels 2, free, stigma columnar. Mericarps follicular, to 15 cm long, slender, rusty puberulus; seeds many, compressed, crowned with long silky coma.

Chavachi, *KJD 25585*

Fl. & Fr.: August-March

Distribution: Fairly common in Evergreen forests of Chavachi and Semi-evergreen forests of Paripode.

RAUVOLFIA L., Sp. Pl. 208. 1753.

- 1a. Herbs, corolla tube 1.5 cm long..... R. *serpentina*
1b. Shrubs, corolla tube less than 5 mm long..... R. *tetraphylla*

Rauvolfia serpentina (L.) Benth. ex Kurz, For. Fl. Burma 2: 171. 1877; Hook. f., Fl. Brit. India 3: 632. 1882; Gamble, Fl. Pres. Madras 807(567). 1923; Manilal & Sivar., Fl. Calicut 164. 1982; Ansari, Fl. Kasaragod Div. 229. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 279. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 523. 2009. *Ophioxylon serpentinum* L., Sp. Pl. 1043. 1753.

Subshrubs, rootstock thick, sap watery. Leaves simple, whorled, 3-4 at each node, 7-10 x 3 cm, oblanceolate, acuminate at both ends, glabrous; lateral nerves to 12 pairs. Cymes axillary and terminal, densely flowered; peduncles to 5 cm long. Sepals 4 mm long, oblong, acute. Corolla white, tube 15 mm long, lobes 5 mm long, oblong, obtuse. Capsules 5 mm, ovoid, obtuse, black; fruiting calyx crimson.

Narikkadavu, *NS & KVB 31449*

Fl. & Fr.: April-October

Distribution: Rare along the boundaries of Farm.

Rauvolfia tetraphylla L., Sp. Pl. 208. 1753; Manilal & Sivar., Fl. Calicut 165. 1982; Ansari, Fl. Kasaragod Div. 230. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 279. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist.

523. 2009. *Rauwolfia canescens* L., Sp. Pl. (ed. 2) 303. 1762; Gamble, Fl. Pres. Madras 808(568). 1923.

A small, much-branched woody shrub, 0.6-1.2 m high. Leaves whorled, 3-5 at each node, ovate-elliptic. Flowers greenish-white or creamy-white in umbellate cymes; peduncle to 2 cm long. Calyx lobes orbicular, ciliate. Corolla white, ca. 4 mm long, lobes ovate, throat villous. Fruits 6-8 mm across, globose, deep red or purple when ripe; seeds oblong, rugose.

Kariyenkappu, *KJD 26297*

Fl. & Fr.: Throughout the year

Distribution: Rare in the Palntations of Kariyenkappu.

TABERNAEMONNTANA L., Sp. Pl. 210. 1753.

Tabernaemontana alternifolia L., Sp. Pl. 211.1753; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 524. 2009. *Tabernaemontana heyneana* Wall., Bot. Reg. 15: t. 1273. 1829; Hook. f., Fl. Brit. India 3: 646. 1882; Manilal & Sivar., Fl. Calicut 166. 1982; Ansari, Fl. Kasaragod Div. 230. 1985.. *Ervatamia heyneana* (Wall.) Cooke, Fl. Pres. Bombay 2:134.1904; Gamble, Fl. Pres. Madras 813(572).1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 277. 1988.

Small trees, to 8 m high; bark corky with shallow fissures, latex milky. Leaves simple, opposite, 13-18 x 4-7 cm, elliptic-oblong, apex acuminate, base acute, lateral nerves 12-15 pairs, intercostae reticulate; petiole 2 cm long. Cymes terminal or axillary; peduncles to 4 cm long. Flowers pedicellate. Calyx 4 mm long, lobes short, oblong, obtuse. Corolla white, tube cylindric, 25 mm long, dialated at mouth, villous inside; lobes 15 mm long, oblong, obtuse, apex crisped. Stamens included; anthers sagitate at base, linear. Carpels distinct. Follicles yellow, 5 x 1.5 cm, beak acuminate; aril red.

Chelachode, *KJD 22526*

Fl. & Fr.: April-October

Distribution: Common in Evergreen forests of Chelachode and Chavachi; Semi-evergreen forests of Paripode and Pothanplavu. Endemic to Western Ghats.

WRIGHTIA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 73. 1811.

Wrightia tinctoria (Roxb.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 47. 1811; Hook. f., Fl. Brit. India 3: 653. 1882; Gamble, Fl. Pres. Madras 815(573). 1923; Ansari, Fl. Kasaragod Div. 230. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 281. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 526. 2009. *Nerium tinctorium* Roxb., Orient. Repert. 1: 39. 1791.

Deciduous trees; upto 15 m; bark 8-10 mm thick, grey, smooth; outer layer thin, inner layer thick, brittle, creamy; latex milky white. Leaves simple, opposite, distichous, 3.5-11 x 2-4 cm, oblong-lanceolate or elliptic-ovate, apex acuminate or caudate acuminate, base acute, margin entire, glabrous, glaucous beneath, chartaceous; petiole 2-5 mm long, stout, glabrous; lateral nerves 5-10 pairs, slender, arched, pinnate, prominent, intercostae reticulate. Flower bisexual, white, scented, in terminal cymes appearing along with new leaves; pedicel 1.5 mm long, bracts 2, minute. Calyx lobes 5, with membranous margin, 2 mm, ovate, obtuse, ciliate, glandular inside. Corolla salver shaped, lobes 5, broad lobes 12 x 5 mm, oblong, obtuse, throat with 1-2 series of erect, fimbriate corona scales, tube 1.5-2 mm. Stamens 5, inserted on the mouth of the tube, anthers sagitate, spurred at base, conniving and adhering to the stigma; disc absent. Carpels 2, free; ovules many; style filiform, stigma ovoid, usually with a toothed basal ring. Fruit of 2 follicular

mericarps, 15-45 cm long, slender, smooth, green, cylindrical, cohering at the tip; seed 16 mm long, black, commate at one end.

Kariyenkappu, *KJD 22552*

Fl. & Fr.: February-November

Distribution: Occasional in Moist deciduous forests.

ASCLEPIADACEAE

- 1a. Erect shrubs or herbs 2
- 1b. Climbers or epiphytic plants..... 3
- 2a. Corolla pale purple to greenish white; gymnostegium violet.....*Calotropis*
- 2b. Corolla crimson; gymnostegium yellow *Asclepias*
- 3a. Epiphytes; leaves thick, fleshy..... *Hoya*
- 3b. Terrestrial plants; leaves not thick..... 4
- 4a. Corolla tube elongate, more than 2 cm long..... *Ceropegia*
- 4b. Corolla tube less than 1 cmlong.....5
- 5a. Corolla tube urceolate..... *Marsdenia*
- 5b. Corolla tube not urceolate 6
- 6a. Corolla lobe alternating with fleshy ridges within sinus..... *Gymnema*
- 6b. Corolla lobes without ridges inside 7
- 7a. Corona lobes tubercle like, radiating from the base of the
staminal column..... *Tylophora*
- 7b. Corona lobes not tubercle like *Toxocarpus*

ASCLEPIAS L., Sp. Pl. 214. 1753.

Asclepias curassavica L., Sp. Pl. 215. 1753; Hook. f., Fl. Brit. India 4: 18. 1883; Gamble, Fl. Pres. Madras 833(585). 1923; Manilal & Sivar., Fl. Calicut 170. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 282. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 527. 2009.

Herbs, stem terete, glaucous. Leaves simple, opposite, 7-10 x 3-4 cm, lanceolate to linear-lanceolate, glabrous; nerves 8-13 pairs, narrow; petiole 1 cm long. Flowers in axillary peduncled cymes; peduncle to 5 cm long, solitary, erect, dichotomous; pedicels 6-15 together, 1.5-2 cm long, slender. Sepals 2.5 mm long, ovate. Corolla ca. 1.2 cm across, orange-red, tube short, lobes oblong, deflexed. Coronal lobes yellow, 7 mm long. Follicle to 7 x 1.5 cm, terete or fusiform; seeds many.

Chavachi, *KJD 31474*

Fl. & Fr.: February-November

Distribution: Run wild in Evergreen forests at Chavachi.

CALOTROPIS R. Br., Mem. Wern. Nat. Hist. Soc. 1: 39. 1811.

Calotropis gigantea (L.) R. Br. in Ait.f., Hort. Kew (ed. 2) 2: 78. 1811; Hook. f., Fl. Brit. India 4: 17. 1883; Gamble, Fl. Pres. Madras 832(585). 1923; Manilal & Sivar., Fl. Calicut 170. 1982; Ansari, Fl. Kasaragod Div. 231. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 528. 2009.

Shrubs, stem rounded. Leaves simple, opposite, 10-16 x 8-10 cm, smaller in branchlets, elliptic-ovate to obovate, apex acute or obtuse, base cordate; lateral nerves 5-7 pairs, adpressed pubescent when young, becoming glabrous on maturity. Flowers pale purple or greenish-white, 3 cm across; pedicels to 3 cm long, stout. Calyx lobes to 3 mm long. Corolla campanulate, tube short, lobes ovate to oblong, recurved. staminal corona of 5 vertical lobes, 1 cm long. Carpels free. Fruit saccate, to 6 x 3 cm, ovoid; seeds many.

Near Farm, *KJD 18755*

Fl. & Fr.: Throughout the year
Distribution: Along the boundaries of Farm.

CEROPEGIA L., Sp. Pl. 211. 1753.

Ceropegia metziana Miq., Anal. Bot. Ind. 3: 11. 1852; M.Y. Ansari, Fasc. Fl. Ind. 16: 25. 1984; Sasidh. & Swarup., Journ. Econ. Tax. Bot. 18: 633. 1994; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 530. 2009. *Ceropegia gracilis* Bedd., Madras J. Lit. Sci. ser. 3, 1: 53. 1864. *Ceropegia brevicollis* Hook. f., Fl. Brit. India 4: 74. 1883, p. p.; Gamble, Fl. Pres. Madras 859(604). 1923, p.p. *Ceropegia stocksii* sensu Gamble, Fl. Pres. Madras 859(604). 1923, non Hook. f. 1883. *Asclepias gigantea* L., Sp. Pl. 214. 1753.

Twiners, stem pubescent at nodes. Leaves simple, opposite, 10-15 x 3-5 cm, ovate or ovate-oblong, apex acute or acuminate, mucronate, base acute; petiole 2-3 cm long. Peduncle to 2 cm long, glabrous or hairy; flowers few together rarely solitary; pedicels 2-2.5 cm long, stout. Sepals 7 mm long, linear. Corolla to 7.5 cm long, base inflated, funnel-shaped above, lobes to 3.5 cm long, ovate-deltoid, dull pink with purple dots. Outer corona 6 mm across, lobes deltoid, bifid, hairy; inner corona 2.5 mm long, glabrous. Follicle 23-28 cm long, 5 mm thick, terete, with a 5 cm long beak; seeds 10 x 3 mm, oblong; coma 15 mm long.

Ambalappara, KVB 31658; Kattikari, NS & KJD 31979

Fl. & Fr.: September-November

Distribution: Fairly common in Evergreen forests of Mullenpara, Kattikari and Ambalappara. Endemic to Southern Western Ghats; Conservation status: Vulnerable.

GYMNEMA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 33. 1811.

- 1a. Coronal ridges not produced beyond the sinus of corolla lobes..... *G. montanum*
1b. Coronal ridges produced beyond the sinus of corolla lobes..... *G. sylvestre*

Gymnema montanum (Roxb.) Hook. f., Fl. Brit. India 4: 31. 1883; Gamble, Fl. Pres. Madras 840(590). 1923; Manilal, Fl. Silent Valley 178. 1988. *Asclepias montana* Roxb., Fl. Ind. 2: 45. 1832. *Bidaria montana* (Roxb.) Rahman & Wilcock, Blumea 34: 99. 1989. *Gymnema tingens* (Roxb.) Wight & Arn. var. *ovalifolia* Wight, Ic. t. 592. 1842.

Glabrous twining shrubs; branchlets terete. Leaves simple, opposite, to 16 x 10 cm, of branchlets much smaller, ovate or oblong, acute or acuminate, base truncate or rounded with few small glands; lateral nerves 5-7 pairs, reticulations prominent; petiole to 2-3.5 cm long. Peduncles to 0.5 cm long, stout; flowers 5-30 together; pedicels 6-7 mm long; slender, pubescent. Calyx lobes linear-oblong, ciliate, 2 mm long; corolla greenish white, glabrous, tube 3 mm long, globose, lobes 3 x 2 mm, oblong. Corolline corona 5 pairs of densely pubescent ridges. Gynostegium 4 x 2 mm, ridged.

Chavachi, KJD 26120; KVB 31515

Fl. & Fr.: April-May

Distribution: Common in Evergreen forests of Chavachi and Chelachode; Plantations of Kariyenkappu.

Gymnema sylvestre (Retz.) R. Br. ex Schult. in Roem. & Schult., Syst. Veg. 6: 57. 1820; Hook. f., Fl. Brit. India 4: 29. 1883; Gamble, Fl. Pres. Madras 839(590). 1923; Manilal & Sivar., Fl. Calicut 169. 1982; Ramach. & V.J. Nair, Fl. Cannanore

Dist. 283. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 530. 2009. *Periploca sylvestris* Retz., Obs. Bot. 2: 15. 1781.

Twining subshrubs, branchlets fulvous-tomentose. Leaves simple, opposite, 4-7 x 3-5 cm, elliptic to ovate or obovate, apex obtusely acute, base truncate or obtuse, subcoriaceous, densely tomentose below, nerves 3 pairs; petiole 1-3 cm long. Flowers 4 mm across in umbellate cymes, many together; peduncle to 1 cm long, hispid; pedicels 6 mm long, slender. Sepals 2 mm long, ovate. Corolla campanulate, yellow, 2.5 mm long, tube globose, lobes triangular. Corolline corona 5 vertical pairs of pubescent ridges. Gynostegium 1.5 x 1 mm, cylindrical. Follicles 7.5 x 0.8 cm, lanceolate, seeds 10 x 5 mm, much compressed.

Chavachi, *KJD 26173*; Pothurumi, *NS & KVB 31427*

Fl. & Fr.: July-March

Distribution: Fairly common in Evergreen forests of Chavachi and Pothurumi.

HOYA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 26. 1811.

Hoya wightii Hook. f., Fl. Brit. India 459. 1883; Gamble, Fl. Pres. Madras 849(597). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 285. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 533. 2009.

Stout pendulous epiphytes, stem terete, glabrous. Leaves simple, opposite, to 7 x 4 cm, elliptic, acuminate, base acute, thick and coriaceous; nerves 6-8 pairs, horizontal; petiole to 2 cm long. Flowers yellowish white, 1.5 cm across, in lateral pedunculate umbels; peduncles to 1 cm long, stout; pedicels 2.5 cm long. Calyx deeply lobed to the base, lobes 2.5 mm long, ovate, ciliolate. Corolla ca. 2 cm across, lobes ovate, margins revolute. Corona of 5 fleshy lobes, deep purple, 6 x 6 mm, lobes 3 mm high, subglobose, stellately radiating from the column. Follicles 6-9 x 0.6 cm, slender, oblong, slightly tapering towards the ends; seeds 4 mm long, coma to 5 cm long.

Ambalappara, *KVB 31759*

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

MARSDENIA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 28. 1811, *nom cons.*

Marsdenia raziana Yoga. & Subram., Proc. Indian Acad. Sci. (Pl. Sci.) 83B: 147. 1976; Sasidh. & Anto, Journ. Econ. Tax. Bot. 21: 247. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 533. 2009.

Climbing glabrous shrubs, stem striate, latex watery. Leaves simple, opposite, 10-19 x 7-10 cm, oblong, acuminate, base rounded or acute, membranous, glabrous and glossy; lateral nerves 7-9 pairs, reticulations prominent beneath; petiole 1-3 cm long. Flowers brownish-pink, 1 x 1.2 cm, in 10-15 flowered umbellate racemes. Calyx ovate, acute, ciliate along the margins. Corolla tube urceolate, lobes ovate, acute, reflexed.

Kattikari, *KVB 31548*

Fl. & Fr.: January-March

Distribution: Fairly common in Evergreen forests of Kattikari, Pothurumi, Chavachi and Mullenpara. Endemic to South India; Conservation status: Vulnerable.

Toxocarpus Wight & Arn. Wight, Contr. Bot. India 61.1834.

Toxocarpus palghatensis Gamble, Bull. Misc. Inform. Kew 1922: 119. 1922 & Gamble, Fl. Pres. Madras 830(583). 1923.

Climbing shrubs; stem pubescent. Leaves simple, opposite, to 8 x 5 cm, smooth, elliptic-obovate, nearly glabrous, abruptly acuminate; main nerves 6-7 pairs. Flowers pale yellow, in axillary, villous racemose cymes. Calyx very small, 5-lobed. Corolla 1 cm long, white, 5-lobed. Corona scales shorter than the stamens, acute. Stamens inserted at the base of the corolla; filaments connate; anthers small, minutely fimbriate at tip. Ovary of 2 carpels. Follicles 2, divaricate; seeds oblong, flattened, tipped with a silky coma.

Way to Meenmutty, *KJD 31491*

Fl. & Fr.: Throughout the year

Distribution: Fairly common at Evergreen forests of Meenmutty. Endemic to southern Western Ghats; Conservation status: Vulnerable.

TYLOPHORA R. Br., Mem. Wern. Nat. Hist. Soc. 1: 28. 1811.

1a. Glabrous twiners *T. capparidifolia*

1b. Pubescent twiners *T. indica* var. *indica*

Tylophora capparidifolia Wight & Arn. in Wight, Contrib. 51.1834; Hook. f., Fl. Brit. India 4:41.1883; Gamble, Fl. Pres. Madras 843(592). 1923; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 535. 2009.

Glabrous twiners; stem twining to the right, slender. Leaves simple, opposite, 6 x 2 cm, elliptic or oblanceolate to obovate, apiculate, round to subcordate at base, coriaceous, with 4-6 pairs of prominent nerve, coarsely reticulate beneath; petiole to 1 cm long. Raceme axillary, solitary, umbellate, congested, to 4 cm long. Flowers few; pedicels 8-12 mm long, slender. Sepals 1.5 mm long, lanceolate. Corolla 4 mm across, lobes obovate, revolute above, glabrous. Corona brown, 1 mm across, lobes 5, uneven. Follicle 3-4 cm long, 8-10 mm thick, ovoid, narrowed at apex into a beak.

Ambalappara, *KVB 31708*

Fl. & Fr.: March-June

Distribution: Rare in Evergreen forests of Ambalappara and Chavachi. Endemic to southern Western Ghats.

Tylophora indica (Burm. f.) Merr., Philipp. J. Sci. 19: 373. 1921, **var. indica**; Manilal & Sivar., Fl. Calicut 169. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 535. 2009. *Cynanchum indicum* Burm. f., Fl. Ind. 70. 1768. *Tylophora asthmatica* (L. f.) Wight & Arn. in Wight, Contrib. 51. 1834; Hook. f., Fl. Brit. India 4: 44. 1883; Gamble, Fl. Pres. Madras 843(593). 1923. *Asclepias asthmatica* L. f., Suppl. Pl. 171. 1781. *Asclepias prolifera* Rottl. ex Ainslie, Mat. Ind. 2: 225. 1826.

Slender, pubescent climbers. Leaves simple, opposite, 4-10 x 2-5.5 cm, ovate to oblong, acute or acuminate apex, base subcordate, entire, slightly pubescent on both sides, petiole to 0.8 cm. Flowers greenish-purple or greenish-yellow, in umbellate cymes; pedicel to 1.3 cm; bracts filiform, hairy. Calyx hairy outside, divided nearly to the base, lobes linear-lanceolate, to 2 mm. Corolla 1 cm across, lobes to 4 mm long. Corona single, lobes acuminate at tip. Ovary ob-conical; style to 1 mm; follicle cylindrical, acute at both ends small, flat. Follicles 7-10 cm long, oblong, tapering towards the apex, glabrous; seeds 7 mm long, broadly ovate, coma 2-2.5 cm long.

Paripode, *KVB 22594*

Fl. & Fr.: February-July

Distribution: Rare in Semi-evergreen forests of Paripode.

PERIPLOCACEAE

- 1a. Stamens inserted on the throat of the corolla; corona
connate with stamensDecalepis
1b. Stamens inserted on the base of the corolla; corona
connate with corolla..... Hemidesmus

DECALEPIS Wight & Arn. in Wight, Contr. Bot. India. 64. 1834.

Decalepis nervosa (Wight & Arn.) Venter, Taxon. 46: 712. 1997. *Brachylepis nervosa* Wight & Arn. in Wight, Contrib. 64. 1834; Hook. f., Fl. Brit. India 4: 7. 1883; Gamble, Fl. Pres. Madras 827(581). 1923. *Bacolepis nervosa* (Wight & Arn.) Decne. ex Moq. in DC., Prodr. 13: 216. 1849.

Climbing shrubs, stem purplish, pubescent; latex milky. Leaves simple opposite, 5-10 x 3-7 cm, elliptic or elliptic-oblong, acute to acuminate, base obtuse, upper surface glabrous and shining; lateral nerves 8-10 pairs, prominent below, purplish in young leaves; petiole to 1 cm long. Flowers in axillary and terminal condensed cymes; peduncle pubescent to glabrescent. Calyx deeply lobed, lobes ovate, acute. Corolla rotate, lobes ovate greenish-purple; corona of 5 broad membranous scales. Stamens 5, attached to the throat of corolla; filaments short. Ovary glabrous; style apex capitate. Follicles narrowly lanceolate, 6-7 cm long.

Ambalappara, KVB 31703

Fl. & Fr.: December-April

Distribution: Rare in Evergreen forests of Ambalappara.

Endemic to Western Ghats.

HEMIDESMUS R. Br., Mem. Wern. Nat. Hist. Soc. 1: 56. 1811.

Hemidesmus indicus (L.) R. Br. in Ait.f., Hort. Kew (ed. 2) 2: 75. 1811, **var. indicus**; Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Pres. Madras 825(580). 1923; Manilal & Sivar., Fl. Calicut 171. 1982; Ansari, Fl. Kasaragod Div. 233. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 284. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 538. 2009. *Periploca indica* L., Sp. Pl. 211. 1753.

Slender twining undershrubs with woody rootstock; stem brownish. Leaves very variable, opposite or in whorls, often variegated, 3-7 x 0.7-3 cm, elliptic-oblong to linear-lanceolate, apex gradually acute-apiculate, base rounded, thin coriaceous, glabrous on both sides; petiole to 4 mm long. Flowers few, subsessile, in short, axillary cymes. Calyx 1-2 mm long, lobes 5, ovate, ciliolate along the margins. Corolla yellow, c. 8 mm across, 3-4 mm long, rotate, lobes 5, fleshy, triangular. Corona of 5 scales. Stamens 5, anthers jointed at apex, appendaged. Carpels 2, apocarpous; ovules many; styles 2; stylar apex flat, 5-angled. Follicles to 10 cm long, cylindric; coma white.

Narikkadavu, KJD 26392

Fl. & Fr.: February-June

Distribution: Rare in Semi-Evergreen Forests of Narikkadavu and Paripode.

Endemic to Peninsular India.

LOGANIACEAE

- 1a. Leaves 3-5 ribbed from the base Strychnos
1b. Leaves penni-nerved..... Fagraea

FAGRAEA Thunb., Vetensk. Acad. Nya. Handb. 3:132. 1782.

Fagraea ceilanica Thunb., Vetensk. Acad. Handl. 3: 132. 1782; Hook. f., Fl. Brit. India 4: 83. 1883 "zeylanica"; Gamble, Fl. Pres. Madras 865(608). 1923; Manilal & Sivar., Fl. Calicut 172. 1982; Ansari, Fl. Kasaragod Div. 234. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 287. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 539. 2009. *Fagraea obovata* Wall. in Roxb., Fl. Ind. 2: 33. 1824; Hook. f., Fl. Brit. India 4: 83. 1883; Gamble, Fl. Pres. Madras 865(608). 1923. *Fagraea coromandelina* Wight, Ic. t. 1316. 1848. *Fagraea malabarica* Wight, Ic. t.1317. 1848.

Small trees, usually epiphytic on tree trunks; branchlets stout with prominent leaf-scars. Leaves simple, opposite, 10-18 x 5-8 cm, obovate or oblanceolate, base cuneate, margin entire, apex obtuse, fleshy, shiny, glabrous; petiole to 2.5 cm long. Inflorescence terminal or axillary, few-flowered corymbose cymes. Flowers large, 6-8 cm across, creamy white. Calyx deeply 5-lobed; lobes ca 8 mm long, obovate, acute or obtuse. Corolla funnel-form; tube 4-5 cm long; lobes 5, broad, twisted to right. Stamens 5, adnate at base of corolla-tube. Ovary 2-celled; ovules many in each cell; stigma capitate. Berry 2-4 x 1.5-3 cm, ellipsoid, shiny; seeds many.

Mullenpara, NS & KJD 31986

Fl. & Fr.: March-December

Distribution: Fairly common in Evergreen forests of Mullenpara and Semi-evergreen forests of Paripode.

STRYCHNOS L., Sp. Pl. 189. 1753.

- 1a. Trees *S. nux-vomica*
- 1b. Climbers..... 2
- 2a. Berries large, more than 8 cm across; flowers more than 1cm*S. colubrina*
- 2b. Berries rather small, less than 5 cm; flowers less than 1 cm 3
- 3a. Climbers with woody tendrils *S. minor*
- 3b. Climbers with out tendrils..... *S. dalzellii*

Strychnos colubrina L., Sp. Pl. 189. 1753; Hook. f., Fl. Brit. India 4: 87. 1883; Gamble, Fl. Pres. Madras 868(610).1923; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 541. 2009. *Strychnos wallichiana* Steud. ex A. DC. in DC., Prodr. 9: 13. 1845; Ramach. & V.J. Nair, Fl. Cannanore Dist. 289. 1988. *Strychnos rheedei* Clarke in Hook. f., Fl. Brit. India 4: 87. 1883. *Strychnos cinnamomifolia* Thw., Enum. Pl. Zeyl. 201. 1860, *var. wightii* Hill, Bull. Misc. Inform. Kew 1917: 194. 1917; Gamble, Fl. Pres. Madras 869(610). 1923; Manilal & Sivar., Fl. Calicut 172. 1982.

Tendrillate climbers. Leaves simple, opposite, 5-8 x 3-5 cm, broadly elliptic, abruptly acuminate, shining, green or black when dry; 3-ribbed, nervules prominent, irregular. Cymes axillary and terminal, peduncled, 5-6 cm across. Flowers many; pedicels 2 mm long. Calyx 1.5 mm long, lobes ovate, obtuse, ciliate. Corolla greenish yellow, tube 10 mm long, hairy inside, lobes 4 x 2 mm, oblong, obtuse. Anthers sessile. Ovary hirsute; ovules manu; style 12 mm long, hirsute, stigmas bilobed, globose. Berry globose, 6-8 cm across, glabrous, greenish; seeds 2.5 cm long, ovoid, flattened.

Chelachode, KJD 22523

Fl. & Fr.: February-July

Distribution: Common in Evergreen forests of Chelachode, Chavachi and Moonamthode and Plantations of Kariyenkappu.

Strychnos dalzellii Clarke in Hook.f., Fl. Brit. India 4: 87. 1883; Gamble, Fl. Pres. Madras 868(610). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 288. 1988.

Climbers with ferruginous, pubescent tendrils. Leaves simple, opposite, up to 10 x 4.5 cm, ovate, acute, rounded at base, 3-nerved. Flowers pale green, sparsely ciliate, in short and dense axillary cymes. Calyx 5 or 4-lobed. Corolla-tube and lobes about equal in length, the lobes with a line of erect hairs within; Stamens 5 or 4 adnate to the corolla-tube; filaments short; anthers bearded at the base. Ovary and style glabrous. Berries ca. 4 cm across, crustaceous, glabrous; seeds several, discoid.

Mullenpara, NS & KJD 31929

Fl. & Fr.: November-December

Distribution: Rare in Evergreen forests of Mullenpara. Endemic to Western Ghats.

Strychnos minor Dennst., Schluss. Hort. Malab. 15, 25, 33. 1818. *Strychnos colubrina* sensu Clarke in Hook. f., Fl. Brit. India 4: 87. 1883, p.p., non L. 1753.

Climbing shrubs; bark pale brown; tendrils 2-branched. Leaves simple, opposite, 5.5-14 x 2.8-5.4 cm, ovate or elliptic-ovate, apex acute or acuminate, base obtuse or rounded, coriaceous, 3-ribbed from a little above the base; petiole to 1.2 cm long. Flowers white in cymes up to 3 cm long. Calyx lobes ca 1 mm long. Corolla tube 2 mm long, throat woolly; lobes ovate-acute, as long as the tube. Ovary and style hirsute. Berry woody, 2-2.5 cm across; seeds 1-3, orbicular.

Kariyenkappu, KJD 31490

Fl. & Fr.: June-October

Distribution: Rare in Plantations of Kariyenkappu.

Strychnos nux-vomica L., Sp. Pl. 189. 1753; Hook. f., Fl. Brit. India 4: 90. 1883; Gamble, Fl. Pres. Madras 868(610). 1923; Manilal & Sivar., Fl. Calicut 171. 1982; Ansari, Fl. Kasaragod Div. 234. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 289. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 542. 2009.

Trees, to 20 m high, bark thin, yellowish or blackish-grey, smooth or scurfy with lenticels. Leaves simple, opposite, 14 x 2-9 cm, elliptic, broadly elliptic or elliptic-ovate, apex acute or obtuse, base acute to attenuate, margin entire, glabrous, shiny, coriaceous; petiole 5-13 mm, slender, glabrous; 3-5 nerved from base, prominent, glabrous; intercostae reticulate. Flowers bisexual, greenish-white, in terminal sessile cymes, sessile, tomentose, bract 5 mm; bracteole 1.5 mm long. Calyx lobes 4, 1 mm long, triangular, acute, pubescent. Corolla greenish-yellow, tube 10 mm long, longer than lobes, slightly hairy near the base within, lobes 4, 4 x 1.5 mm, oblong, acute. Stamens 4, anthers sessile inserted at the throat of corolla tube. Ovary 2-celled, ovules many in each cell. Fruit a berry, 3-5 cm across, globose, yellowish-red or orange, glabrous; seeds 3 or 4, orbicular, flat, shiny, greenish-white, 2-2.5 cm diameter.

Chavachi, KJD 22539

Fl. & Fr.: March-December

Distribution: Rare in Semi-Evergreen forests of Bhoothamkallu.

GENTIANACEAE

- 1a. Flowers irregular Canscora
1b. Flowers regular 2

- 2a. Ovary one celled; calyx free; petals with nectary chambers at Base inside Swertia
 2b. Ovary 2-celled; calyx united; petals with out nectery chambers..... Exacum

CANSCORA Lam., Encycl. Meth. Bot. 1: 601. 1785.

- 1a. Pedicels terete..... *C. diffusa*
 1b. Pedicels 4-angled *C. pauciflora*

Canscora diffusa (Vahl) R. Br. ex Roem. & Schult., Syst. Veg. 3: 301. 1820; Hook. f., Fl. Brit. India 4: 103. 1883; Gamble, Fl. Pres. Madras 878(617). 1923; Manilal & Sivar., Fl. Calicut 173. 1982; Ansari, Fl. Kasaragod Div. 235. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 290. 1988; Mike Thiv, Blumea 48: 11. 2003; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 544. 2009. *Gentiana diffusa* Vahl, Symb. Bot. 3: 47. 1794. *Canscora decurrens* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2:136.1850; Gamble, Fl. Pres. Madras 878(617). 1923; Ansari, Fl. Kasaragod Div. 235. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 290. 1988; Mohanan & Sivad., Fl. Agasthyamala 458. 2002. *Canscora lawii* Wight, Ic. t. 1327. 1848.

Small herbs, stem 4-angular. Leaves simple, opposite, lower leaves 2 x 1.5 cm, elliptic, petiolate, upper ones ovate, sessile, 3-ribbed, glabrous. Cymes terminal; bracts ovate. Flowers many; pedicel 1 cm long, filiform. Calyx 6 mm long, wingless, 5-toothed, glabrous. Corolla white, 9 mm long, tube cylindrical, lobes lanceolate, acute. Two stamens fertile, two sterile. Ovary 1-celled, ovules many. Capsule 5 mm long, linear-oblong.

Paripode, KVB 31683; Ambalappara, KVB 31698

Fl. & Fr.: October-January

Distribution: Common in Evergreen forests of Ambalappara and Chavachi; Semi-Evergreen forests of Narikkadavu and Paripoode and Plantations of Kariyenkappu.

Canscora pauciflora Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 136. 1850; Hook. f., Fl. Brit. India 4: 103. 1883; Gamble, Fl. Pres. Madras 878(617). 1923; Manilal & Sivar., Fl. Calicut 173. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 291. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 544. 2009.

Erect herbs; stem 4-angles, branches winged. Leaves simple, opposite, sessile, to 4.5 x 1.5 cm, ovate-acute, base cuneate, 3-ribbed, membranous, glabrous. Flowers in terminal and axillary, dichotomously branched, lax cymes; bracts leafy; bracteoles lanceolate. Calyx tubular, ca 4 mm long, lobes lanceolate. Corolla rose, tube 5 mm long, limb zygomorphic. Stamens 4, one longer. Ovary 1-celled; ovules many, stigma bilobed. Capsule linear.

Ambalappara KVB 31782; NS & KJD 31988, 31962

Fl. & Fr.: October January

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Western Ghats.

EXACUM L., Sp. Pl. 112. 1753.

Exacum tetragonum Roxb., Fl. Ind. 1: 413. 1820; Hook. f., Fl. Brit. India 4: 95. 1883; Gamble, Fl. Pres. Madras 873(613). 1923; Agrawal, Journ. Econ. Tax. Bot. 3: 984. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 292. 1988; Klackenberg, Opera Bot. 84:37.1985; Babu, Fl. Malappuram Dist. 449. 1990;

Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 546. 2009. *Exacum bicolor* Roxb., Fl. Ind. 1: 413.1820; Hook. f., Fl. Brit. India 4: 96. 1883; Gamble, Fl. Pres. Madras 873(613). 1923; Agrawal, Journ. Econ. Tax. Bot. 3: 983. 1982; Manilal & Sivar., Fl. Calicut 174. 1982; Ansari, Fl. Kasaragod Div. 236. 1985; Vajr., Fl. Palghat Dist. 299. 1990. *Exacum perrottetii* Griseb. in DC., Prodr. 9: 45. 1845.

Tall herbs, 50-120 cm high; stems quadrangular, not or narrowly winged. Leaves simple, opposite, 7 x 1.5 cm, elliptic, narrowed to a broad petiole, acute at apex, 3-ribbed. Cymes terminal, in many flowered corymbs; bracts 7 mm long, linear. Calyx 9 mm long, 4-lobed, lobes ovate, abruptly cuspidate with a cuspidate 2 mm broad wings. Corolla blue or white with blue shades, tube short, lobes 4, to 20 x 8 mm, elliptic, acute. Stamens 4, anthers 8 mm long, slightly curved, eglandular, filaments broaden at base. Ovary 2-celled, ovules many; stigma subcapitate. Capsule globose; seeds small, many.

Ambalappara, NS & KJD 25501

Fl. & Fr.: November-January

Distribution: Common in the Grasslands of Ambalappara. Endemic to Peninsular India.

SWERTIA L., Sp. Pl. 226. 1753.

- 1a. Inflorescence corymbose *S. beddomei*
1b. Inflorescence lax panicles *S. lawii*

Swertia beddomei Clarke in Hook. f., Fl. Brit. India 4: 127. 1883; Gamble, Fl. Pres. Madras 881(619). 1923; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 547. 2009.

Erect herbs, to 60 cm high; branchlets 4-angled and obscurely 4 winged. Leaves simple, opposite-decussate, sessile, 1-3 x 0.8-2 cm, ovate-orbicular, obtuse at apex, subamplexicaule at base, margins entire, 3-5 ribbed, coriaceous. Flowers blue lurid or white, 4-5 mm across, in flat topped terminal and axillary corymbs; peduncle to 15 cm long; pedicel 2.5 cm long. Calyx 4-partite, ovate-oblong or rarely lanceolate, 4-5 x 1-1.5 mm, prominently 3-5 nerved, obtuse or acute at apex, revolute at margins. Corolla lobes 4, elliptic-obovate, 6-7 x 1-3.5 mm, obtuse at apex, often inflexed along margins, lobes with a nectary at base; nectaries with fringed margins. Stamens 4, inserted at base of corolla; filaments linear, ribbon-like, 2.8-3.5 mm long, dilated downwards. Ovary 1-celled, ellipsoid, 3.5-4.5 x 1-2 mm; ovules numerous; style short, 0.5-0.8 mm long; stigma bifid, capitate. Fruit an oblong, sessile, 2-valved capsule; seeds many, small.

Ambalappara, KVB 31652; NS & KJD 31942

Fl. & Fr.: November-April

Distribution: Common in Grasslands and Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Swertia lawii (Wight ex Clarke) Burkill, J. Asiat. Soc. Bengal 2: 379. 1906; Gamble, Fl. Pres. Madras 881(619). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 292. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 548. 2009. *Swertia corymbosa* Wight var. *lawii* Wight ex Clarke in Hook. f., Fl. Brit. India 4:126.1883.

Erect herbs, to 60 cm tall. Leaves simple, opposite, deltoid-ovate, up to 3.5 x 1.3 cm, lanceolate, acuminate, rounded-truncate at base, 3-nerved. Flowers in terminal lax cymes, ca. 3.5 cm long, cymules at the ends of the

inflorescence branches lax. Calyx deeply 4 or 5 partite, tube 0 or very short; lobes narrowly lanceolate. Corolla white with blue nerves, rotate; lobes 4 or 5, obovate, mucronate; nectary 1 near the base of each corolla-lobe, large, ciliate, covered with a fimbriate scale. Stamens 4 or 5, inserted at the base of the corolla, free or slightly jointed in a ring; filaments linear, often dilated downwards; anthers oblong, versatile. Ovary 1-celled; ovules many; style short or 0; stigma bilobed. Fruit a sessile, ovate or oblong, 2-valved capsule; seeds usually many, small, testa reticulate.

Ambalappara, *KVB 31761*

Fl. & Fr.: November-January

Distribution: Rare in Grasslands of Ambalappara. Endemic to southern Western Ghats.

BORAGINACEAE

- 1a. Flowers in paniced cymes; trees Ehertia
- 1b. Flower solitary solitary or in racemes or scorpioid cymes..... 2
- 2a. Flowers solitary or 2-3 together 3
- 2b. Flowers racemes or scorpioid cymes 4
- 3a. Style 2; prostrate herbs Coldenia
- 3b. Style 1; stout subshrubs Rotula
- 4a. Inflorescence racemose; nutlets glochidiate Cynoglossum
- 4b. Inflorescence scorpioid; nutlets smooth..... Heliotropium

COLDENIA L., Sp. Pl. 1: 125. 1753.

Coldenia procumbens L., Sp. Pl. 125. 1753; Hook. f., Fl. Brit. India 4: 144. 1883; Gamble, Fl. Pres. Madras 892(627). 1923; Manilal & Sivar., Fl. Calicut 178. 1982; Ansari, Fl. Kasaragod Div. 238. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 294. 1988.

Trailing herbs, stem and leaves softly white villous. Leaves alternate, 1.5-3 x 0.5-1.5 cm, obliquely obovate or subpinnatifid, apex emarginate, base cuneate, margin irregularly dentate; lateral veins impressed above. Inflorescence axillary few-flowered sessile cymes or some times solitary. Calyx 4-lobed; lobes ovate-acute, ciliate. Corolla white, 2 mm long, tube 1 mm long; lobes 4, imbricate in buds. Stamens 4, included. Ovary 4-lobed, 4-locular; ovule 1-per locule. Drupe of 4 subconnate pyrenes, 1.5-2 mm across, subglobose.

Narikkadavu, *KJD 18779*

Fl. & Fr.: March-May

Distribution: Rare along the boundaries of Farm.

CYNOGLOSSUM L., Sp. Pl. 134. 1753.

Cynoglossum zeylanicum (Vahl ex Hornem.) Thunb. ex Lehm., Neue Schriften Naturf. Gen. Halle 3:20. 1817; Ramach. & V.J. Nair, Fl. Cannanore Dist. 295. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 550. 2009. *Anchusa zeylanica* Vahl ex Hornem., Hort. Hafn. 3. 1807. *Cynoglossum denticulatum* A.DC. var. *zeylanicum* (Vahl ex Hornem.) Clarke in Hook.f., Fl. Brit. India 4: 157. 1883; Gamble, Fl. Pres. Madras 900(632). 1923. *Cynoglossum furcatum* Wall. in Roxb., Fl. Ind. 2: 6. 1824; Hook. f., Fl. Brit. India 4: 155. 1883; Gamble, Fl. Pres. Madras 900(632). 1923.

Erect herbs, to 1 m tall, whole plant softly adpressed pubescent. Leaves simple, alternate, 10-25 x 3-7 cm, oblong-lanceolate, acute at apex, cuneate at

base; nerves to 5 pairs, prominent, arching, upper leaves smaller; petiole to 1 cm long, flat. Racemes 10-35 cm long, straight or arching; flowers many, sessile. Sepals 5, 2 mm long, spreading. Corolla 3-5 mm across, blue, campanulate. Stamens 5, inserted at the throat of the corolla tube. Ovary 4-celled, style gynobasic. Fruit of 4 nutlets, 3-5 mm across, glochidiate.

Ambalappara, *KJD 26152*

Fl. & Fr.: August-October

Distribution: Evergreen forests of lower parts of Ambalappara.

EHRETIA P. Browne, Civ. Nat. Hist. Jamaica 168. 1756.

Ehretia canarensis (Clarke) Gamble, Fl. Pres. Madras 891(626). 1923; Sunil & Sivadasan, Fl. Alappuzha Dist. 460. 2009. *Ehretia laevis* Roxb. var. *canarensis* Clarke in Hook. f., Fl. Brit. India 4: 142. 1883. *Ehretia indica* (Dennst. ex Kostel.) M.R. & S.M. Almeida, J. Bombay Nat. Hist. Soc. 90. 424. 1993.

Small trees. Leaves simple, alternate, 6-10 x 3-4 cm, elliptic, apex acuminate, base cuneate, thin coriaceous, glabrous; lateral nerves 5-7 pairs; petiole c. 2 cm long. Flowers 2.5-3 mm across, in axillary and terminal unilateral corymbose cymes. Calyx minute, 5-toothed. Corolla white, c. 2.5 mm long, lobes 5, oblong, obtuse. Stamens 5, exserted. Ovary minute, 2-celled; ovules 2 in each cell; style 2-fid above middle. Drupe 4-5 mm across, subglobose, red; seeds 4.

Near Farm, *KVB 31204*

Fl. & Fr.: September-January

Distribution: Fairly common in Semi-evergreen forests of Valayamchal and Evergreen forests of Chavachi. Endemic to Peninsular India.

HELIOTROPIUM L., Sp. Pl. 130. 1753.

Heliotropium indicum L., Sp. Pl. 130. 1753; Hook. f., Fl. Brit. India 4: 152. 1883; Gamble, Fl. Pres. Madras 896(630). 1923; Manilal & Sivar., Fl. Calicut 176. 1982; Ansari, Fl. Kasaragod Div. 239. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 295. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 550. 2009.

Erect, branched, pubescent herbs. Leaves simple, opposite, 11 x 6 cm, sub-deltoid or broadly ovate, apex acute, base truncate, margin undulate, chartaceous; petiole 3-6 cm long. Flowers sessile, in terminal or leaf-opposed curved, to 20 cm long spikes. Calyx-lobes 5, 1.5-2 mm long, linear, acute. Corolla pale violet or pink, salver-form; tube 3-4 mm long, slightly constricted distally, 5-lobed; lobes c. 1 mm long, ovate. Stamens 5, subsessile, free. Ovary weakly 4-lobed; stigma conical. Nutlets connate in pairs, separating later, ribbed, each nutlet 2-3 mm long.

Narikkadavu, *NS & KVB 31455*

Fl. & Fr.: September-May

Distribution: Fairly common along river banks at Narikkadavu.

ROTULA Lour., Fl. Cochinch. 121. 1790.

Rotula aquatica Lour., Fl. Cochinch. 121. 1790; Gamble, Fl. Pres. Madras 893(627). 1923; Ansari, Fl. Kasaragod Div. 240. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 295. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 551. 2009. *Rhabdia lycioides* Mart. & Zucc., Nov. Gen. Sp. 2:136.1827; Hook. f., Fl. Brit. India 4:145. 1883. *Ehretia cuneata* Wight, Ic. t. 1385. 1848.

Stout branching shrubs; branches virgate, usually pinkish, glabrous. Leaves simple, alternate or fascicled, 1-2 x 0.5 cm, oblong-oblongate, obtuse, sessile. Flowers solitary or in few flowered cymes axillary. Calyx 3.5 mm long 5-partite, lobes lanceolate. Corolla pink, 5 mm long, 7 mm across, campanulate, 5-lobed. Stamens 5, anthers sagitate at base. Ovary 4-celled, style filiform, stigma capitate. Drupe with 4, 1-seeded pyrenes, free, yellowish, smooth.

Narikkadavu, NS & KVB 31447

Fl. & Fr.: November-May

Distribution: Common in streams.

CONVOLVULACEAE

- 1a. Leafless parasitic climbers, petals with scales *Cuscuta*
- 1b. Leafy nonparasitic climbers or creepers, petals without scales 2
- 2a. Styles 2; flowers 0.8 cm across *Evolvulus*
- 2b. Style 1; flowers more than 1 cm across 3
- 3a. Fruit indehiscent *Argyrea*
- 3b. Fruit dehiscent 4
- 4a. Pollen grains spinulose *Ipomoea*
- 4b. Pollen grains smooth 5
- 5a. Ovary 1-celled, densely hairy *Hewittia*
- 5b. Ovary 4-celled, glabrous 6
- 6a. Stem hairy, corolla 4-6 cm long *Merremia*
- 6b. Stem glabrous, corolla less than 2 cm long *Xenostegia*

ARGYREIA Lour., Fl. Cochinch. 95, 134. 1790.

- 1a. Leaves acute at base *A. elliptica*
- 1b. Leaves cordate at base *A. hirsuta*

Argyrea elliptica (Roth) Choisy, Convolv. Orient. 35. 1834; Ramach. & V.J. Nair, Fl. Cannanore Dist. 297. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 554. 2009. *Ipomoea elliptica* Roth, Nov. Pl. Sp. 113. 1821. *Lettsomia elliptica* (Roth) Wight, Ic. t. 1356. 1848; Hook. f., Fl. Brit. India 4: 192. 1883; Gamble, Fl. Pres. Madras 911(640). 1923.

Twiners, branchlets sparsely pubescent. Leaves simple, alternate, 5-9 x 3-5 cm, elliptic-ovate to obovate, apex acute, base rounded to truncate. Cymes lax, corymbose, to 8 cm; bracts deciduous. Sepals 5, subequal, 4 x 3 mm, ovate, obtuse. Corolla pink to rose, 3-4 cm across. Stamens 5, anthers 3mm. Ovary 1.5 mm, 2-loculare, cell 2-ovuled, style 1.5 cm. Berry 0.7 cm across, orange.

Ambalappara, KJD 25480

Fl. & Fr.: November-March

Distribution: Rare in Evergreen forests of Ambalappara.

Argyrea hirsuta Wight & Arn., Nov. Acta Phys. Med. Acad. Caes. Leop. Carol. Nat. Cur. 18: 356. 1836; Hook. f., Fl. Brit. India 4: 189. 1883; Gamble, Fl. Pres. Madras 909(638). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 297. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 554. 2009. *Rivea hirsuta* (Wight & Arn.) Wight, Ic. t. 891. 1845. *Argyrea hirsuta* Wight & Arn. var. *coacta* Clarke in Hook.f., Fl. Brit. India 4: 189. 1883.

Climbing undershrubs; stem hirsute. Leaves simple, alternate, 13-20 x 7-14 cm, broadly ovate, apex abruptly acuminate, base cordate, densely strigose

above, tomentose beneath; nerves 7-13 pairs, prominent below; petiole 5-11 cm long, densely pubescent. Flowers in axillary few to many flowered cymes; bracts leafy, to 3 cm long, lanceolate, shortly petioled, persistent. Sepals 6-8 x 2-3 mm, oblong, obtuse, sparsely hairy, equal. Corolla 5-7 cm long, funnel-shaped, pale purple, hispid without. Stamens 5. Style filiform; stigma 2-globose. Berry 8-12 mm across, depressed-globose, yellow; seeds embedded in mealy pulp.

Chavachi, *KJD 22595*

Fl. & Fr.: August-December

Distribution: Fairly common in Evergreen forests of Chelachode and Chavachi.

CUSCUTA L., Sp. Pl. 124. 1753.

Cuscuta chinensis Lam., Encycl. 2: 229. 1786; Hook. f., Fl. Brit. India 4: 227. 1883; Gamble, Fl. Pres. Madras 931(654). 1923.

Slender yellow twiners. Leaves absent. Flowers sessile, 5-7, in lateral fascicles. Calyx-lobes 5, c. 2 x 1.5 mm, broadly ovate, scarious. Corolla pale yellow, c. 5 mm across, 3-3.5 mm long, widely funnel-form; lobes triangular-ovate, acute or obtuse, spreading. Stamens 5; filaments longer than the ovoid anthers. Corolla scales oblong, fimbriate above. Ovary c. 1.5 mm long, globose; styles 2, filiform; stigma rounded. Capsule c. 3 mm across, depressed-globose, irregularly dehiscent; seeds c. 1 mm long.

Valayamchal, *KJD 18789*

Fl. & Fr.: November-March

Distribution: Fairly common in Semi-evergreen forests of Valayamchal.

EVOLVULUS L., Sp. Pl. ed. 2, 391. 1762.

Evolvulus nummularius (L.) L., Sp. Pl. (ed.2) 391. 1762; Sivar. et al., Bull. Bot. Surv. India 12: 279. 1970; Manilal & Sivar., Fl. Calicut 188. 1982; Ansari, Fl. Kasaragod Div. 242. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 299. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 557. 2009. *Convolvulus nummularius* L., Sp. Pl. 175. 1753. *Volvulopsis nummularia* (L.) Roberty, Candollea 14: 28. 1952.

Slender prostrate perennial herbs. Leaves simple, subopposite to alternate, 5-15 x 4-10 mm, broadly ovate to orbicular, apex obtuse to emarginate, base subcordate, glabrous or sparsely hairy below; petiole to 5 mm long. Flowers 1-2, in leaf-axils; pedicels slender 2-5 mm long. Calyx lobes 5, free, 2-3.5 mm long, ovate-lanceolate, acute, ciliate on margins. Corolla white, 6-8 mm across, rotate. Stamens subexserted. Capsule 3-4 mm across, globose; seeds brown to black.

Near Farm, *KJD 22509*

Fl. & Fr.: Throughout the year

Distribution: Along the boundaries of Farm.

HEWITTIA Wight & Arn., Madras J. Lit. Sci. 5: 17, 22. 1837.

Hewittia malabarica (L.) Suresh in Nicolson et al., Interp. Hort. Malab. 88. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 557. 2009. *Convolvulus malabaricus* L., Sp. Pl. 155. 1753. *Hewittia scandens* (Milne) Mabb. in Manilal, Bot. Hist. Hort. Malab. 84. 1980; Manilal & Sivar., Fl. Calicut 179. 1982; Ansari, Fl. Kasaragod Div. 243. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 300. 1988. *Convolvulus bicolor* Vahl, Symb. Bot. 3: 25. 1794, non Desr. 1792. *Hewittia bicolor* (Vahl) Wight & Arn., Madras J. Lit. Sci. 5: 22. 1837; Hook. f., Fl. Brit. India 4: 216. 1883; Gamble, Fl. Pres. Madras 924(649). 1923. *Hewittia sublobata* (L. f.) O. Ktze., Rev. Gen. Pl. 2: 441. 1891.

Stem twining or prostrate, pubescent. Leaves simple, alternate, 4-7 x 3-4 cm, ovate, apex acute, base cordate, margin entire or angled, puberulent, basally 3-nerved; petiole to 6 cm long. Flowers in axillary 1 to few-flowered peduncled cymes; bract linear-lanceolate, attached to little below the calyx. Sepals 5, outer 3 larger, accrescent, inner 2 smaller. Corolla yellowish or cream coloured with a purple centre, c. 3 cm across, campanulate, limb shallowly 5-lobed. Stamens included; filaments dilated at base. Ovary imperfectly 2-locular; ovules 2-per ovule; stigma 2. Capsule 4-valved, 8-10 mm across, subglobose; seeds 4 or less, 5-6 mm long, subtrigonus, black.

Near Farm, KJD 26393

Fl. & Fr.: October-January

Distribution: Along the boundaries of Farm.

IPOMOEA L., Sp. Pl. 159. 1753.

- 1a. Leaves entire or slightly lobed..... 2
- 1b. Leaves palmately lobed or pinnately dissected..... 5
- 2a. Leaves and sepals hairy..... *I. barlerioides*
- 2b. Leaves and sepals not hairy..... 3
- 3a. Corolla deep red..... *I. hederifolia*
- 3b. Corolla not red..... 4
- 4a. Corolla salvar formed..... *I. marginata*
- 4b. Corolla campanulate..... *I. obscura*
- 5a. Leaves pinnately dissected, corolla red..... *I. quamoclit*
- 5b. Leaves palmately lobed..... 6
- 6a. Corolla funnal shaped, 4 cm across, white..... *I. pes-tigridis*
- 6b. Corolla campanulate, 1.5 cm across, purple..... *I. deccana*

Ipomoea barlerioides (Choisy) Benth. ex Clarke in Hook. f., Fl. Brit. India 4: 201. 1883; Gamble, Fl. Pres. Madras 915(642). 1923; Sasidh., Fl. Periyar Tiger Reserve 267. 1998. *Aniseia barlerioides* Choisy, Convolv. Orient. 102. 1834.

Hispid creepers or twiners. Leaves simple, alternate, to 5 x 2 cm, ovate-oblong, obtuse, mucronate, cordate at base, densely strigose hairy, nerves 5-7 pairs; petiole 1 cm long. Flowers solitary; axillary; peduncle 10 mm long, pedicels short. Sepals 1.7 x 1 cm, outer ovate, inner lanceolate, acute to acuminate, densely pilose hairy, broaden in fruit. Corolla 6 cm long; 4-5 cm across, purple, hairy outside. Staminal filaments 2 cm long, hairy at base. Ovary glabrous, stigma biglobose. Capsule 12 x 10 mm, glabrous; seeds 6 x 5 mm, trigonus, densely hairy along the angles and faces.

Ambalappara, KVB 31689; KJD 26308

Fl. & Fr.: June-January

Distribution: Rare in Grasslands of Ambalappara.

Ipomoea deccana Austin, Rev. Handb. Fl. Ceylon 1: 324. 1980; Ramach. & V.J. Nair, Fl. Cannanore Dist. 302. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 560.2009. *Ipomoea bracteata* Wight, Ic. t. 1374. 1848, non Cav. 1799; Hook. f., Fl. Brit. India 4: 203. 1883; Gamble, Fl. Pres. Madras 918(644). 1923. *Ipomoea deccana* var. *lobata* (Clarke) Johri, Journ. Econ. Tax. Bot. 5: 432. 1984.

Hispid creepers. Leaves 3-5-lobed, alternate, ca. 4 x 4 cm, cordate at base; lobes rhomboid, acute; petiole 4-5 cm long. Peduncle 2.5-5 cm long; bracts 1.5 x 1 cm, ovate, obtuse, 2-5 together, forming a capitate head; flowers 3 together; sessile. Sepals unequal, to 9 x 3 mm, acute, hairy; inner smaller. Corolla purple, 15 mm long, campanulate, glabrous. Staminal filaments

unequal, inserted near the base of corolla tube. Capsule 6 x 6 mm, globose, puberulus in vertical lines; seeds pubescent, black.

Mullenpara, NS & KJD 31926

Fl. & Fr.: November-January

Distribution: Rare in open areas in Evergreen forests of Mullenpara.

Ipomoea hederifolia L., Syst. Nat. (ed. 10) 925. 1759; Manilal & Sivar., Fl. Calicut 184. 1982; Ansari, Fl. Kasaragod Div. 245. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 303. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 561. 2009. *Quamoclit phoenicea* (Roxb.) Choisy, Mem. Soc. Phys. Geneve 6: 433. 1834; Gamble, Fl. Pres. Madras 919(645). 1923. *Ipomoea phoenicea* Roxb., Fl. Ind. 2: 92. 1824. *Ipomoea coccinea* sensu Clarke in Hook. f., Fl. Brit. India 4: 199. 1883, non Rottl. 1803.

Slender twining herbs. Leaves simple or 3-5-angled, alternate, 4-8 x 3.5-7 cm, ovate to suborbicular, cordate at base, acute to shortly acuminate at apex, glabrous; petiole to 6 cm long. Cymes few-flowered, axillary; peduncles 5-8 cm long; pedicels 0.7-1 cm long. Sepals 5, 2-4 mm long, oblong or elliptic. Corolla deep red, salver-form, tube to 3.5 cm long, limb 1.5-2.5 cm across, subentire. Ovary 2-3 mm long, conical, 4-celled; ovule 1 in each cell. Capsule 5-6 mm across, subglobose; seeds 4, c. 3 mm long, pyriform, black.

Paripode, KJD 25573

Fl. & Fr.: October-December

Distribution: Along the boundaries of Farm at Paripode.

Ipomoea marginata (Desr.) Manitz, Feddes Repert. 85: 638. 1974, **f. marginata**; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 561. 2009. *Convolvulus marginatus* Desr. in Lam., Encycl. 3: 558. 1792. *Ipomoea sepiaria* Roxb., Fl. Ind. 2: 90. 1824; Hook. f., Fl. Brit. India 4: 209. 1883; Manilal & Sivar., Fl. Calicut 181. 1982; Ansari, Fl. Kasaragod Div. 246. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 304. 1988.

Twining herbs. Leaves simple, alternate, triangular-cordiform, 5-8 by 3-5 cm, apex acute-apiculate, base cordate, thinly pubescent, petiole 1-2 cm long. Cymes sub-umbellate. Sepals sub-equal, obovate, glabrous. Corolla pinkish-white, c. 3 cm across, salver-form. Stamens included. Capsule globose; seeds pubescent.

Paripode, KJD 25574

Fl. & Fr.: December-March

Distribution: Along the boundaries of Farm.

Ipomoea obscura (L.) Ker-Gawl., Bot. Reg. 3. t. 239. 1817; Hook. f., Fl. Brit. India 4: 207. 1883; Gamble, Fl. Pres. Madras 916(643). 1923; Manilal & Sivar., Fl. Calicut 183. 1982; Ansari, Fl. Kasaragod Div. 245. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 303. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 563. 2009. *Convolvulus obscurus* L., Sp. Pl. (ed. 2) 220. 1762.

Slender twining herbs. Leaves simple, alternate, 2.5-6 x 2-4 cm, ovate to cordate, apex acuminate, base cordate, pubescent or glabrescent on both surfaces; petiole to 3 cm long. Flowers solitary or in subumbellate cymes; pedicel to 1-1.5 cm long. Sepals 4-8 mm long, ovate-lanceolate, apex acute-apiculate. Corolla yellowish, throat purplish, 1.5-2.5 cm long, c. 2.5 cm across, campanulate. Stamens 5, villous at base. Ovary c. 1.5 mm long,

conical; stigma capitate. Capsule 6-8 mm across, subglobose, apically beaked; seeds c. 5 mm long, ovoid, black, thinly pubescent.

Near Farm, *KJD 18780*

Fl. & Fr.: October-March

Distribution: Along the boundaries of Farm.

Ipomoea pes-tigridis L., Sp. Pl. 162.1753; Hook. f., Fl. Brit. India 4: 204. 1883; Gamble, Fl. Pres. Madras 918(644). 1923; Manilal & Sivar., Fl. Calicut 184. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 304. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 563. 2009. *Ipomoea pes-tigridis* L. var. *hepaticifolia* (L.) Clarke in Hook. f., Fl. Brit. India 4: 204. 1883. *Ipomoea hepaticifolia* L., Sp. Pl. 161. 1753.

Densely hispid twiners. Leaves alternate, broadly orbicular, deeply 5-9-lobed; lobes obovate, apex acute to acuminate; petiole 3-7 cm long. Flowers subsessile in axillary, capitate clusters; peduncle to 7 cm long; bracts oblong, acute, villous. Calyx-lobes unequal, 8-12 mm long, ovate-acuminate, pubescent. Corolla white, 3-4 cm long, c. 4 cm across, funnel-form. Ovary ca 1 mm long, conical. Capsule 8-10 mm long, ovoid, brown; seeds 4 mm long, pubescent, black.

55 Block, *KJD 26380*

Fl. & Fr.: September-December

Distribution: Near Farm side of 55 block Plantation.

Ipomoea quamoclit L., Sp. Pl. 159. 1753; Hook. f., Fl. Brit. India 4: 199. 1883; Manilal & Sivar., Fl. Calicut 184. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 564. 2009. *Quamoclit pinnata* (Desr.) Bojer, Hort. Maurit. 224. 1837; Gamble, Fl. Pres. Madras 919(645). 1923. *Convolvulus pinnatus* Desr. in Lam., Encycl. 3: 567. 1792.

Slender twining herbs. Leaves alternate, pinnately dissected, 1.5-4.5 cm long, lobes many, 1-1.5 cm long, very narrowly linear, glabrous. Flowers solitary, axillary or in few flowered axillary cymes; peduncles 4-5 cm long; pedicels 1-2 cm long. Calyx lobes 0.4-0.5 cm long, lanceolate. Corolla red; lobes 0.4-0.6 x 0.25-0.3 cm, ovate. Filaments unequal, exerted. Ovary 0.2-0.3 cm long, 4-celled; ovule 1 in each cell; stigmas capitate. Capsule 0.8-1 x 0.5-0.6 cm, ovoid; seeds 4, 0.4-0.5 x 0.1-0.15 cm, compressed, conical, black on drying.

Kariyenkappu, *KJD 25577*

Fl. & Fr.: October-December

Distribution: Earlier settlements.

MERREMIA Dennstedt ex Endlicher, Gen. 1403. 1841, *nom. cons.*

- 1a. Leaves entire; flowers white *M. umbellata*
1b. Leaves lobed; flowers yellow *M. vitifolia*

Merremia umbellata (L.) Hall. f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 928(651). 1923; Manilal & Sivar., Fl. Calicut 186. 1982; Ansari, Fl. Kasaragod Div. 248. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 306. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 565. 2009. *Convolvulus umbellatus* L., Sp. Pl. 155. 1753. *Ipomoea cymosa* Roem. & Schult., Syst. Veg. 4: 241. 1819; Hook. f., Fl. Brit. India 4: 211. 1883.

Twining; young shoots puberulous. Leaves alternate, 4-7 x 1.5-3.5 cm, ovate-lanceolate, base cordate or rounded, apex acuminate, pubescent below; petiole 1.5-2.5 cm long. Inflorescence axillary umbelliform cymes; peduncle 1-3 cm long; pedicels 7-10 mm long. Sepals 6-8 mm long, ovate-lanceolate, apiculate, scarious on margins. Corolla white, campanulate; tube 2-3 cm long, pubescent without; limb 2.5-3 cm across. Stamens 5, unequal; anthers twisted. Ovary 2-celled, ovules 2 in each cell; stigma capitate. Capsule 8-10 x 5-6 mm, ovoid; seeds long hairy, black.

Kariyenkappu, *KJD 25596*

Fl. & Fr.: January-April

Distribution: Weed in Plantations of Kariyenkappu and margins of Evergreen forests at Chavachi.

Merremia vitifolia (Burm. f.) Hall. f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 928(651). 1923; Manilal & Sivar., Fl. Calicut 185. 1982; Ansari, Fl. Kasaragod Div. 249. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 307. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 565. 2009. *Convolvulus vitifolius* Burm.f., Fl. Ind. 45.t.18. 1768. *Ipomoea vitifolia* (Burm. f.) Blume, Bijdr. 709. 1826; Hook. f., Fl. Brit. India 4: 213. 1883.

Twining shrubs; stem brownish-black, young shoots patently hairy. Leaves alternate, lobed, 6-12 cm long, equally wide, base cordate, margin dentate-serrate, acute to acuminate at apex of lobation, sparsely fulvous hairy on both sides, basally 7-ribbed; petiole 3-8 cm long. Inflorescence axillary, 1-3-flowered cymes; peduncles 4-5 cm long. Sepals 10-15 x 6-8 mm, ovate-lanceolate, mucronate, outer hirsute, inner glabrescent. Corolla yellow, campanulate, 3.5-5 cm long, 4-6 cm across. Ovary 2-celled, ovules 2 in each cell. Capsule 1-1.2 cm across, globose, fruiting sepals much larger; seeds 4, 6-8 mm long ovoid.

Kariyenkappu, KVB 31520

Fl. & Fr.: November-February

Distribution: Weed in Plantations at Kariyenkappu.

XENOSTEGIA D.F.Austin & Staples, Brittonia 32(4): 533. 1981.

Xenostegia tridentata (L.) Austin & Staples, Brittonia 32: 533. 1980, **ssp. tridentata**; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 567. 2009. *Convolvulus tridentatus* L., Sp. Pl. 157. 1753. *Ipomoea tridentata* (L.) Roth in Roem., Arab. Bot. 1: 38. 1797; Hook. f., Fl. Brit. India 4: 205. 1883. *Merremia tridentata* (L.) Hall. f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Pres. Madras 928(652). 1923; Manilal & Sivar., Fl. Calicut 186. 1982; Ansari, Fl. Kasaragod Div. 247. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 306. 1988.

Trailing herbs with long slender branches and thick root-stock. Leaves alternate, simple, 2-4 x 0.5-1.2 cm, linear-lanceolate, base auricled and toothed, apex acute, mucronate, sessile to subsessile. Flowers axillary few-flowered cymes, sometimes solitary; peduncle 1-2 cm long. Sepals 5-6 x 2-3 mm, lanceolate, acuminate. Corolla campanulate, cream coloured or yellow with a purplish eye at centre; tube 1-1.5 cm long; limb spreading 1-1.5 cm across, subentire. Stamens 5. Ovary 2-celled; stigma 2-lobed. Capsules 5-8 mm across, subglobose; seeds 4, glabrous, brown.

Chavachi, *KJD 22553*

Fl. & Fr.: November-January

Distribution: Forests margins at Chavachi.

SOLANACEAE

- 1a. Fruit capsular, echinate; corolla trumpet shaped *Datura*
- 1b. Fruit berry; corolla rotate or campanulate 2
- 2a. Calyx in fruit completely enclosing the berry..... *Physalis*
- 2b. Calyx not completely enclosing the berry 3
- 3a. Anthers longer than filaments; berries globose..... 4
- 3b. Anthers smaller than filaments; berries elongate *Capsicum*
- 4a. Calyx saucer-shaped in fruit, flowers fascicles *Lycianthes*
- 4b. Calyx distinctly lobed in fruit, flowers cymes or racemes *Solanum*

CAPSICUM L., Sp. Pl. 188. 1753.

Capsicum annum L., Sp. Pl. 188. 1753, **var. annum**; Gamble, Fl. Pres. Madras 941(661). 1923; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 575. 2009. *Capsicum annum* L. var. *acuminata* Fingerh., Mon. Gen. Caps. 13, t.2, f.c. 1832; Manilal & Sivar., Fl. Calicut 190. 1982; Ansari, Fl. Kasaragod Div. 249. 1985. *Capsicum purpureum* Roxb., Fl. Ind. 1: 573. 1832. *Capsicum frutescens* Clarke in Hook. f., Fl. Brit. India 4: 239. 1883, non L. *Capsicum annum* L. var. *longum* Sendt., Flora 28: 172. 1845. *Capsicum bicolor* Jacq., Fragm. 66. t. 99. f. 1. 1805.

Subshrubs, 60-150 cm high, usually laxly branched; stem angular, ± pubescent, especially on the younger parts. Leaves solitary or paired, 2-10 x 1-4 cm, ovate to lanceolate, acuminate; petioles 0.5-3 cm long. Flowers usually solitary, pendent at least in fruit. Calyx ± truncate, undulate. Corolla lobes lanceolate, 4 mm long, widely spreading. Fruit pendent, oblong-ovoid, ± acute, ca 5 cm long (see note below), yellow turning reddish, shining; seeds smooth, 3-5 mm diameter, yellow.

Kariyenkappu, *KJD* 18782

Fl. & Fr.: Through out the Year

Distribution: Earlier settlements, also growing wild.

DATURA L., Sp. Pl. 179. 1753.

Datura stramonium L., Sp. Pl. 179. 1753; Hook. f., Fl. Brit. India 4: 242. 1883; Gamble, Fl. Pres. Madras 941(660). 1923; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 569. 2009. *Datura stramonium* L. var. *tatula* Clarke in Hook. f., Fl. Brit. India 4: 242. 1883. *Datura tatula* L., Sp. Pl. (ed. 2) 256. 1762. *Datura inermis* Jacq., Hort. Vindob. 3: 44. t. 82. 1776. *Datura laevis* L.f., Suppl. Pl. 146. 1781. *Datura bertolonii* Paxt. ex Guss, Fl. Sic. Sy. 1: 267. 1842. *Datura ferox* Nees, Trans. Linn. Soc. London 17: 75. 1837, non L. *Datura wallichii* Dunal in DC., Prodr. 13: 539. 1852. *Stramonium vulgatum* Gaertn., Fruct. 2: 243. t. 132. f. 4. 1791.

Subshrubs, 60-120 cm tall, branched, pubescent; the branches often purplish. Leaves alternate, simple, 8-17 x 4-13 cm, ovate or broadly so, sinuately dentate, minutely puberulous, cuneate; petiole 2-5 cm long. Flowers single or paired, axillary, white; Calyx 3.5-5.5 cm long, tubular, 5-dentate, puberulous, persistent; lobes 6-9 mm long, strongly reflexed in fruit, apiculate. Corolla 7-10 cm long, white or purplish suffused; limb up to 8 cm broad, shallowly 5-lobed, with the lobes, ± triangular-acuminate. Stamens 5; anthers ± 5 mm long, with the lobes narrow oblong, usually white. Capsule erect, 3-4 cm long, ovoid, spiny and densely pubescent, splitting by 4 valves; spines up to 5 mm long; seeds many, 3 mm long, reniform, reticulate-foveolate, and black.

Fl. & Fr.: July-September

Distribution: Margins of forest boundaries with Farm.

LYCIANTHES Hassler, *Annuaire Conserv. Jard. Bot. Geneve* 20: 180. 1917.

Lycianthes laevis (Dunal) Bitter, *Abh. Nat. Ver. Bremen* 24: 484. 1920, **ssp. laevis**; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 569. 2009. *Solanum laeve* Dunal, *Solan. Synop.* 22. 1816; Hook. f., *Fl. Brit. India* 4: 231.1883; Gamble, *Fl. Pres. Madras* 936(657). 1923.

Subshrubs, often scandent; branches zig-zag, angular. Upper leaves often paired and unequal, elliptic-lanceolate, acuminate, to 18 x 6 cm, membranous. Flowers 2-5 in axils; pedicels ca. 8 mm long, enlarges in fruit to 1.5 cm. Calyx truncate or with subulate lobes. Corolla white with pale purple shades, 1 cm across. Berry globose, red, to 1 cm across; seeds angular.

Kattikari, *KJD* 25590

Fl. & Fr.: December-June

Distribution: Fairly common in Evergreen forests of Mullenpara and Kattikari.

PHYSALIS L., *Sp. Pl.* 183. 1753.

Physalis angulata L., *Sp. Pl.* 183. 1753; Hook. f., *Fl. Brit. India* 4: 238. 1883; Gamble, *Fl. Pres. Madras* 939(659). 1923; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 570. 2009. *Physalis minima* L., *Sp. Pl.* 183. 1753; Hook. f., *Fl. Brit. India* 4: 238. 1883; Gamble, *Fl. Pres. Madras* 939(659). 1923; Ansari, *Fl. Kasaragod Div.* 251. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 309. 1988.

Annual herbs; branches angular. Leaves simple, alternate, 3-7 x 1.5-3 cm, ovate or elliptic-lanceolate, apex acute base cuneate, unequal sided, margins dentate or sinuate, sometimes entire, glabrous or sparsely pubescent; petiole to 4 cm long. Flowers axillary, solitary; pedicels ca 8 mm long. Calyx campanulate, 5-toothed, inflated and to 2.5 cm across in fruit. Corolla pale-yellow with a purple base, campanulate, c. 8 mm across; limb plicate, shortly lobed. Stamens 5, unequal; anthers oblong. Ovary globose, glabrous; ovules many; style linear; stigma obscurely 2-lobed. Berry 6-8 mm across, globose, enclosed by the inflated calyx; seeds many, discoid, minutely rugose.

Kariyenkappu, *KJD* 26281

Fl. & Fr.: July-December

Distribution: Rare along the boundaries of Farm.

SOLANUM L., *Sp. Pl.* 184. 1753.

- 1a. Corolla white.. *S. torvum*
- 1b. Corolla blue or violet. 2
- 2a. Lower surface of leaves fulvous tomentose; berry red *S. giganteum*
- 2b. Lower surface of leaves not fulvousyellow; berry orange-Yellow *S. violaceum*

Solanum giganteum Jacq., *Coll. Bot.* 4: 125. 1791; Hook. f., *Fl. Brit. India* 4: 233. 1883; Gamble, *Fl. Pres. Madras* 937(657). 1923; Ansari, *Fl. Kasaragod Div.* 251. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 311. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 572. 2009. *Solanum niveum* Vahl, *Symb. Bot.* 2: 41. 1791.

Large shrubs, 1-3.5 m high; stems and leaves covered with very minute stellate hairs of equal arms; prickles on stems only, small, stout, grouped. Leaves simple, 20-25 x 5-7 cm, elliptic, acute at either ends, entire,

membranous; petiole to 5 cm long. Cymes terminal or subterminal; peduncle 4-5 cm long. Flowers densely packed; pedicel 1 cm long, densely white-stellate hairy. Corolla blue, hairy outside. Berry 7 x 7 mm, red, glabrous; seeds smooth.

Ambalappara, NS & KVB 31422

Fl. & Fr.: June-March

Distribution: Rare in Evergreen forests of Ambalappara.

Solanum torvum Sw., Prodr. 47. 1788; Hook. f., Fl. Brit. India 4: 234. 1883; Gamble, Fl. Pres. Madras 937(658). 1923; Manilal & Sivar., Fl. Calicut 189. 1982; Ansari, Fl. Kasaragod Div. 253. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 312. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 573. 2009.

Shrubs to 2 m tall; stem densely stellate-hairy when young; prickles few, scattered. Leaves 7-14 x 5-10 cm, ovate, usually coarsely 2-3-sinuate, apex acute, base obliquely subcordate, stellately pubescent on both sides, dense on lower sides, chartaceous, scattered with a few prickles on midrib and on petiole; lateral nerves 4 or 5 pairs; petioles 1.5-3.5 cm long. Inflorescence supra-axillary, many-flowered corymbose cymes; peduncle to 5 cm long. Calyx tube 2-2.5 mm long, campanulate, lobes oblong. Corolla white, c. 2.5 cm across; lobes 5-6 mm long, ovate, pubescent outside. Berry 1-1.5 cm across, globose, pale green turning dull orange; seeds discoid, smooth.

Chavachi, KJD 22596

Fl. & Fr.: July-March

Distribution: Fairly common in disturbed forests areas at Chavachi.

Solanum violaceum Ortega, Nov. Pl. Descr. Dec. 56. 1798, **ssp. violaceum**; Hepper in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 6: 378. 1987; Manilal & Sivar., Fl. Calicut 190. 1982; Matthew, Kew Bull. 46: 545. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 574. 2009. *Solanum anguivi* auct. non Lam.: Ramach. & V.J. Nair, Fl. Cannanore Dist. 310. 1988; Sasidh., Fl. Parambikulam WLS 212. 2002. *Solanum indicum* Hook. f., Fl. Brit. India 4: 234. 1883, non L. 1753; Gamble, Fl. Pres. Madras 938(658). 1923.

Armed undershrubs, up to 1.5 m tall; branches minutely stellate-hairy on young parts, glabrate when mature. Leaves 5-12 x 4-7 cm, ovate or ovate-oblong, sinuately to deeply lobed, apex subacute, base rounded or unequal, sparsely stellate-hairy above, stellate-woolly beneath, prickly on the nerves; petiole to 2.5 cm long. Flowers bluish-violet in extra-axillary racemes; peduncle c. 4 cm long; pedicel to 8 mm long. Calyx cupular; lobes 5, c. 5 mm long, triangular, prickly. Corolla to 2 cm across, campanulate. Stamens 5; anthers c. 5 mm long. Ovary 2 mm across, globose; stigma acute. Berry 0.8-1.3 cm across, globose; orange yellow when ripe.

Ambalappara, KVB 31706

Fl. & Fr.: August-December

Distribution: Fairly common in Evergreen forests of Ambalappara.

SCROPHULARIACEAE

- 1a. Leaves pinnatisect 2
- 1b. Leaves simple 3
- 2a. Calyx teeth linear, glabrous..... Parasopubia
- 2b. Calyx teeth ovate, woolly Spopubia

- 3a. Corolla regular Scoparia
- 3b. Corolla irregular(in Bacopa corolla faintly bilipped) 4
- 4a. Calyx winged in fruit Torenia
- 4b. Calyx not winged 5
- 5a. Calyx foliaceous 6
- 5b. Calyx not floiaceous 7
- 6a. Leaves entire; flowers bluish-white Bacopa
- 6b. Leaves serrate; flowers yellow Mecardonia
- 7a. Corolla mouth widely open, perfectly bilipped Lindernia
- 7b. Corolla mouth rounded opening, not perfectly bilipped Striga

BACOPA Aubl., Hist. Pl. Guiane 128, t. 48. 1775, *nom. cons.*

Bacopa monnieri (L.) Pennell, Proc. Acad. Nat. Sci. Philad. 98: 94. 1946; Manilal & Sivar., Fl. Calicut 193. 1982; Ansari, Fl. Kasaragod Div. 255. 1985; Joseph, Aquatic Angiosp. Malabar 211. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 577. 2009. *Lysimachia monnieri* L., Cent. Pl. 2: 9. 1756. *Gratiola monnieri* (L.) L., Syst. Nat. (ed. 10) 851.1759. *Moniera cuneifolia* Michx., Fl. Bor. Amer. 2: 22. 1803, "Monniera"; Gamble, Fl. Pres. Madras 953(669). 1923. *Herpestis monniera* (L.) Kunth, Nov. Gen. Sp. 2: 366. 1818; Hook. f., Fl. Brit. India 4: 272. 1884.

Aquatic or amphibious, prostrate, semi-succulent herbs; stem creeping, branches ascending. Leaves 1-1.5 x 0.4-0.6 cm, ovate-oblong or spatulate, rounded at apex, base narrowed, punctate above, thick, sessile. Flowers solitary, axillary; pedicels to 2.5 cm long; bracteoles 2, up to 3 mm long. Calyx-lobes 5, unequal; outer calyx lobe c. 5 x 4 mm, ovate, others slightly smaller. Corolla bluish-white, c. 8 mm long, broadly campanulate, faintly 2-lipped; lobes 5, subequal. Stamens 4, didynamous. Ovary oblong-globose; style slightly deflexed. Capsule 3-4 x 1.5-2 mm, ovoid or oblong, enclosed in calyx; seeds c. 0.5 mm long, oblong, reticulate.

Kariyenkappu, *KJD 18739*

Fl. & Fr.: Through out the year.

Distribution: Cultivated.

LINDERNIA All., Melanges Philos. Math. Soc. Roy. Turin. 3(1): 178. 1766.

- 1a. Perfect stamens 4, staminoides absent 2
- 1b. Perfect stamens 2, staminoides 2..... 3
- 2a. Calyx shortly toothed, glabrous *L. crustacea*
- 2b. Calyx deeply divided, hairy *L. caespitosa*
- 3a. Leaves penninerved 4
- 3b. Leaves 3-ribbed from base *L. parviflora*
- 4a. Leaves base truncate, margin aristate-entate *L. ciliata*
- 4b. Leaves base attenuate, sub entire to distantly serrate 5
- 5a. Prostrate herbs, bracts linear-lanceolate *L. antipoda*
- 5b. Erect herbs, bracts setaceous *L. oppositifolia*

Lindernia antipoda (L.) Alston in Trimen, Fl. Ceylon 6: 214. 1931; Manilal & Sivar., Fl. Calicut 200. 1982; Ansari, Fl. Kasaragod Div. 258. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 316. 1988; Joseph, Aquatic Angiosp. Malabar 224. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 581. 2009. *Ruellia antipoda* L., Sp. Pl. 635. 1753. *Gratiola grandiflora* Roxb., Pl. Corom. t. 179. 1805. *Gratiola veronicifolia* Retz., Obs. Bot. 4: 8. 1786. *Bonnaya grandiflora* (Roxb.) Spreng., Syst. Veg. 1: 41. 1824. *Bonnaya veronicifolia* (Retz.) Urban, Berl. Deutsch. Bot. Ges. 2: 436. 1884; Hook. f., Fl. Brit. India 4: 285. 1884.

Ilysanthes veronicifolia (Retz.) Urban, Berl. Deutsch. Bot. Ges. 2: 436. 1884; Gamble, Fl. Pres. Madras 962(675). 1923. *Lindernia anagallis* (Burm.f.) Pennell var. *grandiflora* (Retz.) Mukerjee, J. Indian Bot. Soc. 24: 133. 1945.

Prostrate or diffuse herbs, rooting at the nodes. Leaves simple, opposite, variable 1.5-2.5 x 0.5-1 cm, elliptic-obovate, apex obtuse, base cuneate, margin subentire to serrate; penninerved, subsessile. Flowers solitary, axillary or in terminal racemes; bracts leafy; pedicle to 1 cm long. Calyx divided to the base; lobes c. 4 mm long, lanceolate, margin scarious. Corolla bluish with an yellow mouth, 6-8 mm long, internally short pilose between the staminodes. Stamens 2, fertile; staminodes 2, hooked. Capsule 1-1.4 cm long, linear-lanceolate; seeds yellow, ridged.

Narikkadavu, KVB 31435

Fl. & Fr.: June-February

Distribution: Common along River banks.

Lindernia caespitosa (Blume) Panigrahi, Taxon 33: 320. 1984; Ansari, Fl. Kasaragod Div. 259. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 317. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 582. 2009. *Diceros caespitosus* Blume, Bijdr. 753. 1826. *Lindernia pusilla* (Willd.) Boldingh, Zakfl. Java 165. 1916; Manilal & Sivar., Fl. Calicut 199. 1982; . *Gratiola pusilla* Willd., Sp. Pl. 1: 105. 1797. *Vandellia scabra* Benth., Scroph. Ind. 36. 1835; Hook. f., Fl. Brit. India 4: 281. 1884; Gamble, Fl. Pres. Madras 959(673). 1923. *Lindernia hirta* (Cham. & Schltr.) Pennell, J. Arnold Arbor. 24: 250. 1943.

Prostrate or diffuse herbs, rooting at nodes, hirsute. Leaves simple, opposite, 1-1.5 x 0.7-1 cm, ovate-orbicular, apex acute, base rounded, margin crenate-serrate, sub-glabrous to pubescent above, hirsute beneath, pinnately nerved, subsessile. Flowers axillary 2 per node; pedicel 1-1.5 cm, long, glabrous to sparsely glandular-pubescent. Calyx-lobes 5, divided to the base, c. 3 mm long, oblong-lanceolate, margin scarious. Corolla 5-8 mm long, tube white, yellow at mouth, upper lip pale brown or completely violet. Stamens 4, lower pair appendaged. Capsule c. 3 mm, subglobose, equalling or shorter than fruiting calyx; seeds yellow, short cylindric.

Narikkadavu, KVB 31438

Fl. & Fr.: May-October

Distribution: Common along Riverbanks at Narikkadavu.

Lindernia ciliata (Colsm.) Pennell, Brittonia 2: 182. 1936; Manilal & Sivar., Fl. Calicut 199. 1982; Ansari, Fl. Kasaragod Div. 259. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 317. 1988. *Gratiola ciliata* Colsm., Prodr. Desc. Grat. 14. 1793. *Gratiola serrata* Roxb., Fl. Ind. 1: 140. 1820. *Ilysanthes serrata* (Roxb.) Urban, Berl. Deutsch. Bot. Ges. 2: 436. 1884; Gamble, Fl. Pres. Madras 962(675). 1923. *Bonnaya brachiata* Link & Otto, Ic. Pl. Select. 25, t.11. 1820; Hook. f., Fl. Brit. India 4: 284. 1884.

Small erect annual herbs. Leaves simple, opposite, 0.8-1.5 x 0.4-0.6 cm, elliptic-oblong, apex obtuse or acute, base rounded, margin aristate-dentate, penninerved, sessile. Flowers in lax terminal racemes; pedicels 1-2 mm long; bracts leafy, 2-3 mm long. Calyx-lobes 5, ca 5 mm long, linear. Corolla pink or bluish-pink, 8 mm long, tube curved, 2-lipped. Stamens 2; anthers unequal; staminodes with divergent hooks. Ovary 2-3 mm long, elongate. Capsule 1-1.5 cm long, linear, septum winged, exceeding the fruiting calyx; seeds black.

Kariyenkappu, *KJD 26398*

Fl. & Fr.: June-October

Distribution: Rare along Riversides at Kariyenkappu.

Lindernia crustacea (L.) F.v. Muell., Syst. Cens. Austral. Pl. 1: 97. 1882; Manilal & Sivar., Fl. Calicut 199. 1982; Ansari, Fl. Kasaragod Div. 260. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 317. 1988; Joseph, Aquatic Angiosp. Malabar 225. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 582. 2009. *Capraria crustacea* L., Mant. Pl. 1: 87. 1767. *Vandellia crustacea* (L.) Benth., Scroph. Ind. 35. 1835; Hook. f., Fl. Brit. India 4: 274. 1884; Gamble, Fl. Pres. Madras 959(673). 1923.

Prostrate, diffusely branched herbs, rooting at nodes; stem 4-angled, slightly winged on angles. Leaves simple, opposite, 0.8-1.5 x 0.7-1.2 cm, ovate, apex subacute, base truncate, margin serrate, penninerved; petiole c. 5 mm long. Flowers axillary, solitary or 2-per node on terminal racemes; pedicel 1-1.2 cm long. Calyx 4 mm long, divided to 1/3, 5-ribbed, lobes elliptic-lanceolate, ciliate on margins. Corolla rose to purple, tube 5 mm long. Stamens 4, didynamous; lower pair of stamens with a subulate appendage at the middle of filament. Ovary globose. Capsule c. 5 mm long, 2-3 mm across, ovoid; seeds minute, many.

Narikkadavu, *KVB 31463*

Fl. & Fr.: August-November

Distribution: Common at Riverbanks of Narikkadavu, Kariyenkappu and Chavachi.

Lindernia oppositifolia (Retz.) Mukerjee, J. Indian Bot. Soc. 24: 134. 1945; Manilal & Sivar., Fl. Calicut 200. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 318. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 584. 2009. *Gratiola oppositifolia* Retz., Obs. Bot. 4: 8. 1786. *Bonnaya oppositifolia* (Retz.) Spreng., Syst. Veg. 1: 41. 1824; Hook. f., Fl. Brit. India 4: 286. 1884. *Vandellia oppositifolia* (Retz.) Haines, Bot. Bihar and Orissa 634. 1922. *Ilysanthes oppositifolia* (Retz.) Urban, Berl. Deutsch. Bot. Ges. 2: 435. 1884; Gamble, Fl. Pres. Madras 962(676). 1923.

Procumbent herbs; stems glabrous. Leaves simple, opposite, 4 x 0.5 cm, linear-oblong, acute, distantly serrate, sessile. Racemes to 13 cm long, terminal; pedicels opposite, 2 cm long, slender, perpendicular to the axis; flowers paired. Sepals 7 mm long, linear lanceolate, free to the base. Corolla 12 mm long; upper lip entire or emarginate, lower lip equally 3-lobed. Anthers divaricate; staminodes linear, bulged at apex. Capsule 17 x 1.5 mm, terete; seeds 0.3 mm long, obovoid, minutely muriculate.

Narikkadavu, *KVB 31462*

Fl. & Fr.: July-October

Distribution: Rare along the riverbank at Narikkadavu. Endemic to Peninsular India.

Lindernia parviflora (Roxb.) Haines, Bot. Bihar and Orissa 645. 1922; Manilal & Sivar., Fl. Calicut 201. 1982; Ansari, Fl. Kasaragod Div. 260. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 318. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 584. 2009. *Gratiola parviflora* Roxb., Corom. Pl. 3: 3, t.204. 1811. *Ilysanthes parviflora* (Roxb.) Benth., Scroph. Ind. 34. 1835; Hook. f., Fl. Brit. India 4: 283. 1884; Gamble, Fl. Pres. Madras 961(675). 1923.

Decumbent herbs, 10-20 cm high; stems glabrous. Leaves simple, opposite, 1.5 x 0.7 cm, ovate, acute, entire, sessile; nerves 3 pairs. Flowers in terminal racemes or upper axillary; bracts 5 x 3 mm, ovate; pedicel deflexed in fruit, 1.5 cm long. Sepals 3 mm long, connate at base. Corolla 6 mm long; upper lip bifurcated at apex; lower lip obtusely 3-lobed. Staminodes with lateral vermiform appendages. Capsule 5 x 2.5 mm, ovoid, glabrous; seeds 0.3 mm long, obovoid, yellow, glabrous.

Ambalappara, *KJD 26124*

Fl. & Fr.: June-October

Distribution: Rare in Evergreen forests of Ambalappara.

MECARDONIA Ruiz & Pavon, Prodr. 95. 1794.

Mecardonia procumbens (Mill.) Small, Fl. Southeast. U.S. 1065 & 1338. 1903; Joseph et al., Indian J. Botany 5: 126. 1982; Ansari, Fl. Kasaragod Div. 261. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 320. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 585. 2009. *Erinus procumbens* Mill., Prodr. Veg. Ind. Occ. 92. 1788. *Bacopa procumbens* (Mill.) Greenm., Publ. Field Columbian Mus. Bot. ser. Chicago 2: 261. 1907.

Diffuse herbs; stem 4-angled. Leaves simple, opposite, 1-1.5 x 0.4-0.9 cm, ovate-lanceolate, apex acute, base acute, margin crenate-serrate, penninerved, subsessile. Flowers axillary, solitary; pedicels to 1 cm long, bractioles 2, c. 4 mm long, oblong. Calyx deeply 5-partite, lobes unequal; outer 3 c. 6 x 3 mm, ovate-lanceolate; inner 2 c. 4 x 1 mm, narrower. Corolla yellow, 5-7 mm long, obscurely 2-lipped, lobes unequal. Stamens 4, didynamous; anther cells stipitate. Stigma lamellate. Capsule to 6 x 2 mm, oblong-cylindric, 2-valved, included in the calyx; seeds with testa reticulate.

Kariyenkappu, *KVB 31436; NS & KJD 31987*

Fl. & Fr.: October-January

Distribution: Rare along the boundaries of plantations at Kariyenkappu.

PARASOPUBIA H.-P. Hofm. & Eb. Fisch., Bot. Jahrb. Syst. 125: 357. 2004.

*Parasopubia Sps.

Suberect annual herbs, 10-25 cm height, stem terete. Leaves opposite, all 3-5 segmented, 1-1.5 cm long, lobes narrow, filiform, glabrous; margins entire. Flowers axillary, solitary; bracts 2, subulate, 2 mm long. Calyx 3-4 mm, lobbed, lobes 5, acuminate. Corolla purple, campanulate, tube up to 2 cm long, sparsely hairy, lobes 5, subequal, spreading, rounded; Anthers 4, pendent from apex of the filament. Ovary 2-celled. Capsules obovoid, 3 x 2 mm, calyx persistent.

Ambalappara, *KJD 26346*

Fl. & Fr.: October-January

Distribution: Rare in Grasslands of Ambalappara.

This species is closely allied to *P. hofmannii* pradeep & Pramod (2013). But differed by Plant size, size and shape of leaf and lobes, flower size, colour, calyx etc

SCOPARIA L., Sp. Pl. 116. 1753.

Scoparia dulcis L., Sp. Pl. 116. 1753; Hook. f., Fl. Brit. India 4: 289. 1884; Gamble, Fl. Pres. Madras 964(678). 1924; Manilal & Sivar., Fl. Calicut 193. 1982; Ansari, Fl. Kasaragod Div. 262. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 320. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 586. 2009.

Erect annual or perennial herbs. Leaves simple, decussate to whorled, 1-3 x 0.5-1.5 cm, obovate-oblong, apex acute, base attenuate, margin crenate-serrate, penninerved, punctate, chartaceous; petiole to 0.7 cm long. Flowers axillary, solitary or 2; pedicels slender 4-7 mm long. Calyx lobes 2-3 mm, ovate-oblong, ciliate along margin. Corolla white 4-6 mm long, rotate, throat densely hairy, lobes

spathulate. Stamens 4, subequal, 3-4 mm long. Ovary globose, 2-celled; ovules many; stigma truncate. Capsules 1-2 mm across, globose; seeds 4-angled, reticulate.

Kariyenkappu, *KJD 31481*

Fl. & Fr.: Through out the year

Distribution: Fairly common along the forest boundaries.

SOPUBIA Ham. ex D. Don, Prodr. Pl. Nepal. 88. 1825.

Sopubia trifida Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 88. 1825; Hook. f., Fl. Brit. India 4: 302. 1884; Gamble, Fl. Pres. Madras 970(682). 1924; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 587. 2009.

Stout rigid herbs; stems hispid. Leaves 3-fid or upper ones entire; lobes 1-2 cm long, linear-oblong, coriaceous, covered with tubercle based hairs. Flowers axillary or in terminal racemes; pedicels 7 mm long. Calyx 3.5 mm long, campanulate, lobes triangular, glandular. Corolla 12 mm across, lobes rotate, subequal. Stamens 4, didynamous; anthers meeting in pairs, one anther cell fertile and the other small and imperfect, bearded at base. Capsule 3 x 2.5 mm, emarginate at apex; seeds brown.

Ambalappara, *KJD 25459*

Fl. & Fr.: May-August

Distribution: Rare in Evergreen forests of Ambalappara.

STRIGA Lour., Fl. Cochinch. 17. 1790.

Striga asiatica (L.) O. Ktze., Rev. Gen. Pl. 2: 466. 1981; Manilal & Sivar., Fl. Calicut 194. 1982; Ansari, Fl. Kasaragod Div. 263. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 321. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 588. 2009. *Buchnera asiatica* L., Sp. Pl. 1630. 1753. *Striga lutea* Lour., Fl. Cochinch. 22. 1790; Hook. f., Fl. Brit. India 4: 299. 1884; Gamble, Fl. Pres. Madras 968(680). 1924; Mohanan, Fl. Quilon Dist. 288. 1984.

Herbs to 35 cm high, tubercled hairy. Leaves simple, opposite, 4 x 0.5 cm, lanceolate to oblanceolate, thickly scabrid. Flowers sessile in terminal spike; bracts and bracteoles lanceolate. Calyx lobes 1 cm long, oblong, united to near the tip, tubercled hairy. Corolla to 14 mm long, tube slender; upper lip orbicular, entire. Capsule 4 x 3 mm, oblong, glabrous; seeds angular, pitted

Ambalappara, *KVB 31757; KJD 26347*

Fl. & Fr.: July-January

Distribution: Common in Grasslands of Ambalappara.

TORENIA L., Sp. Pl. 619. 1753.

Torenia courtallensis Gamble, Bull. Misc. Inform. Kew 1923: 116. 1923 & Gamble, Fl. Pres. Madras 956(671). 1923. *Torenia cordifolia* sensu Hook. f., Fl. Brit. India 4: 276. 1884 p.p., non Roxb. 1802.

Creeping herbs; stems slender, glabrous. Leaves simple, opposite, 2.5 x 1.5 cm, ovate-deltoid, acute, rounded at base, sparsely hairy; petiole 0.5 cm long. Flowers axillary, solitary; pedicels to 7 cm long; hirtus. Calyx 0.8 cm long, broadly winged; wing ciliate. Corolla tube white; lobes obtuse, hairy, bluish violet. Appendage on staminal filaments 3 mm long, clavate. Capsule 8 mm long, ellipsoid, glabrous.

Kariyenkappu, *KVB 31254; NS & KVB 31324; Ambalappara, KJD 31465*

Fl. & Fr.: June-February

Distribution: Common in Evergreen forests of Chavachi to Ambalappara, and Asthippara.

OROBANCHACEAE

- 1a. Calyx spathaceous, split on one side *Aeginetia*
1b. Calyx tubular, 5-lobbed 2
2a. Anthers spurred; stigma peltate *Christisonia*
2b. Anthers not spurred; stigma not peltate *Campbellia*

AEGINETIA L., Sp. Pl. 632. 1753.

Aeginetia indica L., Sp. Pl. 632. 1753; Hook. f., Fl. Brit. India 4: 320. 1884; Gamble, Fl. Pres. Madras 974(685). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 323. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 590. 2009.

Parasitic leafless herbs, root stock short, horizontal; scapes many, erect, unbranched, naked, glabrous, deep pink or brown, 15-30 cm long. Flowers solitary; bracts and bracteoles absent. Calyx 2 cm long, glabrous, reddish. Corolla 3 cm long, dark purple, tube broad, lobes equal, rounded, glabrous. Upper stamens with one anther lobe; lower stamen with one sterile and one fertile lobes. Capsule 2 cm long, dehisce apically; seeds many, white, rugose.

Paripode, *KJD 25418*

Fl. & Fr.: August-September

Distribution: Rare in Semi-evergreen forests of Paripode.

CAMPBELLIA Wight Ic. t. 1424. 1849.

Campbellia neilgherrica (Gardner) Panigrahi et Das, Indian journal of Forestry, 5 (4): 323. 1982. *Christisonia neilgherrica* Gard., Calcutta J. Nat. Hist. 8: 157. 1847; Hook. f., Fl. Brit. India 4: 322. 1884; Sasidh., Fl. Periyar Tiger Reserve 284. 1998. *Campbellia cytinooides* Wight, Ic. t. 1425. 1849; Gamble, Fl. Pres. Madras 976(686). 1924. *Campbellia aurantiaca* Wight, Ic. t. 1424. 1849 *Phelipaea cytinooides* Reuter in DC., Prodr. 11: 14. 1847.

Stout parasitic herbs; stems ca. 6 cm long, densely covered with thick scales; scales 10 x 8 mm, ovate, obtuse; whole plant yellow; leaves absent. Flowers in terminal clusters, sessile or shortly pedicelled; bracts 10 mm long, ovate, obtuse; bracteoles 2, each 8 mm long, ovate, boat shaped, acute, glandular hairy. Calyx 2 cm long, campanulate, lobes rounded, pubescent. Corolla 3 cm long, tube cylindric, broad, lobes obovate, obtuse, glandular hairy. Anthers not spurred, filaments equal, to 17 mm long, glandular hairy at base. Ovary hemispherical, glabrous, style 20 mm long, hairy; stigma globose, papillose.

Ambalappa, *KJD 26123*

Fl. & Fr.: April-August

Distribution: Rare in Evergreen forests of Ambalappa.

CHRISTISONIA Gard., Calcutta J. Nat. Hist. 8: 153. 1897.

- 1a. Bracteoles present; whole plant glandular hairy, less than 15 cm tall..... *C. bicolor*
1b. Bracteoles absent; plants not glandular hairy, more than 25 cm tall ... *C. tubulosa*

Christisonia bicolor Gard., Calcutta J. Nat. Hist. 8: 159. 1847; Hook. f., Fl. Brit. India 4: 322. 1884; Gamble, Fl. Pres. Madras 976(686). 1924. *Christisonia aurantiaca* Wight, Ic. t. 1486. 1849.

Parasitic leafless herbs, stem 8-12 cm long, pubescent; scales few, distant. Flowers peduncled and pedicellate; bracteoles 2, 8 x 3 mm, lanceolate, acute, pubescent. Calyx 18 mm long, brick-red, lobes short, triangular, acuminate, glandular pubescent. Corolla 6 cm long, tube narrow below, widening above,

lobes yellow, orbicular, glandular hairy. Staminal filaments 25 mm long, sterile, anther lobes 3 mm long, spur-like, acuminate. Ovary 1-celled, placenta lobed, ovules many; style to 4.5 cm long, stigma peltate with a large pit at centre.

Kattikari, KVB 31670

Fl. & Fr.: August-February

Distribution: Rare in Evergreen forests of Kattikari.

Christisonia tubulosa (Wight) Benth. ex Hook. f., Fl. Brit. India 4: 321. 1884; Gamble, Fl. Pres. Madras 975(685). 1924; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 591. 2009. *Oligopholis tubulosa* Wight, Ic. t. 1422. 1849.

Fleshy leafless parasitic herbs, 15-26 cm high; stem scaly, simple or branched from the rootstock; scales 2-3 mm long, ovate-lanceolate. Inflorescence terminal, lax racemes; pedicels 1-2.5 cm long. Calyx tubular; tube 0.8-1.2 cm long; lobes obtuse. Corolla funnel-shaped, purplish white; tube 2.5-4 cm long, 2-lipped, 5-lobbed; lobes orbicular, subequal, lower lip yellowish at throat. Stamens 4, didynamous, connivent in pairs; anthers 2-celled, 1 cell perfect, other sterile, spurred. Ovary 1-celled, ovules many; style slender; stigma peltate. Capsule 0.8-1.2 cm long, ovoid, calyx tube persistent in fruits; seeds many, minute.

Ambalappara, KVB 31413; Vellachatam KJD 31471

Fl. & Fr.: July-August

Distribution: Rare in Evergreen forests of Chavachi and Ambalappara. Endemic to southern Western Ghats.

LENTIBULARIACEAE

UTRICULARIA L., Sp. Pl. 18. 1753.

- 1a. Foliar organs orbicular, Lower lip of corolla 5 lobbed.....U. striatula
1b. Foliar organs linear, Lower lip 2-3 lobed 2
2a. Racemes twining, flowers more than 15 mm U. reticulata
2b. Racemes erect, flowers less than 12 mm.....U.graminifolia

Utricularia graminifolia Vahl, Enum. Pl. 1: 195. 1804; Gamble, Fl. Pres. Madras 981(690). 1924; Manilal & Sivar., Fl. Calicut 208. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 323. 1988; M.K. Janarth. & Henry, Bladderworts India 57. 1992; Joseph, Aquatic Angiosp. Malabar 87. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 593. 2009. *Utricularia smithiana* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849; Gamble, Fl. Pres. Madras 982(690). 1924; M.K. Janarth. & Henry, Bladderworts India 101. 1992. *Utricularia conferta* Wight, Ic. t. 1575. 1850. *Utricularia caerulea* sensu Clarke in Hook.f., Fl. Brit. India 4: 331. 1884, non L. 1753.

Herbs; rhizoids up to 2.5 mm long, c. 0.3 mm thick, numerous, glandular, tapering towards apex, branches up to 2.5 mm long, papillose; stolons up to 10 cm long, profusely branched, glandular. Foliar organs up to 10 x 1.5 mm, linear to strap-shaped, at base of scape and on stolons, 3-nerved, nerves branched further, rounded to obtuse or rarely retuse at apex. Traps 1-3 mm across, subglobose, slightly compressed, subdimorphic, numerous on vegetative organs; those on leaves sessile or subsessile, sometimes long-stalked; mouth basal; appendages 2, subulate simple, glandular. Racemes up to 30 cm long, 1-1.5 mm thick, erect, rarely branched, 1-9 flowered; scales 1-2

x 0.9-1.2 mm, basifixed, ovate to lanceate, rarely deltoid, 1 or 3 nerved, or nerves absent, acute to acuminate at apex; bracts 1.5-2.5 x 1-1.5 mm, basifixed, ovate to lanceate, 1 or 3 nerved, acute to acuminate at apex, bracteoles 1-2.5 mm long, basifixed, subulate, 1-nerved; sterile bracts and bracteoles rarely seen among fertile ones. Flowers 7-12 mm long; pedicels up to 11 mm long, erect, slightly winged. Calyx-lobes ovate to lanceate; upper lobes 3-6 x 2-3.5 mm, acuminate at apex; lower 2.5-5.8 x 1.5-3 mm, 2-4 dentate at apex. Corolla blue to violet or pink; upper lip 4-6.5 x 2-3.5 mm, linear-oblong, longitudinally streaked, crested at centre, ciliate along lower margin, truncate, rounded or obtuse at apex; lower lip 4-7 x 3-7 mm, obovate, rarely orbicular, hairy in throat, bigibbous at base, obscurely 3-lobed, rounded or retuse at apex; spur 4.5-7 mm long, curved, conical, acute at apex. Stamens 1.5-2 mm long; filaments strap-shaped; anther thecae distinct. Pistil 1.5-2 mm long; ovary ovoid, compressed; style short; stigma 2-lipped, upper lip semiorbicular, lower truncate and hairy. Capsules 3-4 mm long, ovoid, thickened along dehiscent margin; placenta 1.6-2.5 x 1-1.5 mm, oblongoid or ovoid, compressed; seeds 0.2-0.4 mm across, subglobose to obovoid; hilum terminal, prominent; testa cells reticulate.

Ambalappara, NS & KJD 31966

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Ambalappara.

Utricularia striatula Smith, Res. Cyclop. 37: n.17. 1819; Gamble, Fl. Pres. Madras 983(691). 1924; Subram., Indian For. 96: 528. 1970; Ramach. & V.J. Nair, Fl. Cannanore Dist. 324. 1988; M.K. Janarth. & Henry, Bladderworts India 106. 1992; Joseph, Aquatic Angiosp. Malabar 94. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 594. 2009. *Utricularia orbiculata* Wall. ex A. DC. in DC., Prodr. 8: 18. 1844; Hook. f., Fl. Brit. India 4: 334. 1884. *Utricularia glochidiata* Wight in Hook.'s J. Bot. Kew Gard. Misc. 1: 373. 1849 & Ic. t. 1581. 1850.

Slender herbs; rhizoids up to 2.5 cm long, simple, few or altogether absent; stolons up to 9 cm long, simple, rarely branched, glandular. Foliar organs with pseudopetiole up to 15 mm long, orbicular to obovate, rosulate at scape base, scattered on stolons, expanded portion up to 5 mm across, veins dichotomously branched. Traps up to 1.5 mm across, globose to obliquely ovoid; mouth lateral; appendages glandular hairy, on expanded, divergent upper lip. Racemes up to 18 mm long, erect, often zigzag, glabrous, up to 10 flowered; scales if present 1-1.5 mm long, medifixed; bracts 0.6-2 mm long, medifixed, constricted at middle, limbs unequal; bracteoles 0.7-1.5 mm long, medifixed, limbs unequal. Flowers up to 10 mm long; pedicels 1.5-7 mm long, filiform, spreading or recurved in fruit, papillose at least in fruiting. Calyx-lobes unequal, papillose; upper lobe 1.2-4 x 2-4 mm, obovate to obcordate, emarginate, truncate or obtuse at apex; lower lobe 0.6-2 x 0.4-2 mm, oblong to ovate, truncate, notched or rounded at apex. Corolla pink, lilac, violet, white to variously tinged, often yellow-blotched near base; upper lip 0.6-2 mm across, semiorbicular to deltoid, bidentate, truncate or irregular at apex; lower lip 3-7 x 3-10 mm, 3- or 5-lobed, throat hairy, base raised or flat, rounded or truncate at apices of lobes; spur 1-6 mm long, cylindrical or conical, rarely reduced to a mound, obtuse, acute or retuse at apex. Stamens up to 1.2 mm long; filaments strap-shaped, curved; anther thecae subdistinct. Pistil up to 1.2 mm long; ovary obliquely ovoid, attached to base of upper calyx-lobe; style distinct;

stigma 2-lipped, lower lip oblong to semiorbicular, upper lip obsolete. Capsules 1.5-3.5 mm long, obliquely ovoid, attached to upper calyx-lobe, keeled in ventral side, dehisce by a longitudinal ventral slit; palcenta c 1 x 0.6 mm, flask-shaped; seeds 0.3-0.4 mm long, clavate, cylindrical or oblongoid, attached radially to placentum, glochidiate.

Kariyenkappu, *KJD 26118*

Fl. & Fr.: June-November

Distribution: Common in almost all areas on wet rocks.

Utricularia reticulata Smith, Exot. Bot. 2. t.119. 1805; Hook. f., Fl. Brit. India 4: 331. 1884; Gamble, Fl. Pres. Madras 982(690). 1924; Manilal & Sivar., Fl. Calicut 208. 1982; Ansari, Fl. Kasaragod Div. 266. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 324. 1988; M.K. Janarth. & Henry, Bladderworts India 91. 1992; Joseph, Aquatic Angiosp. Malabar 90. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 593. 2009.

Terrestrial herbs; rhizoids up to 2 cm long, capillary; stolons upto 5 cm long, capillary, profusely branched. Foliar organs upto 1 cm long, narrowly linear, 1-nerved, attenuate at base, obtuse at apex. Traps numerous, 0.5-1 mm long, subglobose; appendages 2, subulate. Racemes up to 45 cm long, twining, rarely erect; scales similar to the bracts; bracts 2-3 x 1-1.5 mm, ovate to lanceolate, basifixed, apex acute; bracteoles subulate, about as long as bract. Flowers 1.5-2.5 cm long; pedicles 5-15 mm long, erect at anthesis, deflexed in fruit, narrowly winged. Calyx-lobes subequal, 4-8 x 3-7 mm, lanceolate to ovate, acute to acuminate at apex. Corolla violet, blue or white; upper lip 7-12 mm long, obovate or suborbicular; lower lip 10-15 x 8-11 mm, orbicular to obovate, apex rounded; spur subulate about as long as the limb, conical, slightly curved. Stamens 2-3 mm long. Ovary ovoid; stigma 2-lipped, truncate at apex. Capsules 4-6 x 3-4 mm, ovoid or discoid, compressed; seeds obovoid, testa reticulate.

Ambalappara, *NS & KJD 31970*

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Ambalappara .

GESNERIACEAE

- 1a. Perfect stamens 4..... 2
- 1b. Perfect stamens 2..... 5
- 2a. Epiphytic subshrubs; seeds tipped with hairs *Aeschynanthus*
- 2b. Terrestrial herbs; seeds without hairs 3
- 3a. Leaves equal at base; flowers white or pale yellow 4
- 3b. Leaves unequal at base; flowers blue *Rhynchoglossum*
- 4a. Scapigerous plants, fruit a loculicidal capsule..... *Jerdonia*
- 4b. Erect plants, fruit a berry *Rhynchotechum*
- 5a. Fruit loculicidal; leaves radicle *Didymocarpus*
- 5b. Fruit circumscissile; leaves cauline..... *Epithema*

AESCHYNANTHUS Jack, Trans. Linn. Soc. London 14: 42. 1823, *nom. cons.*

Aeschynanthus perrottetii A.DC. in DC., Prodr. 9: 261. 1845; Clarke in Hook. f., Fl. Brit. India 4: 339. 1884; Gamble, Fl. Pres. Madras. 985(692). 1924; Subram. & Henry, Bull. Bot. Surv. India 12:1. 1970; Manilal, Fl. Silent Valley 199. 1988; V. S. Ramach. & Nair, Fl. Cannanore 325. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 555. 2009.

Epiphytic scandent subshrubs; stem glabrous. Leaves opposite, 6-8 x 1.2-1.5 cm, elliptic, succulent, acute, rounded or acute at base. pale below; petiole ca 5 mm long; lateral nerves obscure. Flowers axillary, solitary or paired; pedicels 1-1.3 cm long. Sepals, 4-5 mm long, linear-lanceolate. Corolla scarlet, lobes streaked

with white, 3.5-5 cm long, tubular, curved, widening above, oblique at mouth, lobes 5, subequal, ovate, obtuse, glandular-ciliate. Stamens 4, all perfect; filaments 2-2.5 cm long, free, inserted at the middle of the corolla tube; upper stamens with smaller anthers, confluent in pairs. Ovary long-stipitate; linear, 1-celled, ovules many; style slender, stigma terminal. Capsule to 15-20 cm long, linear; seeds linear, many.

Ambalappara, *KJD 25490*

Flowering & Fruiting: November-January.

Distribution: Occasional in evergreen forests of Ambalappara.

DIDYMOCARPUS Wall., Edinburgh Philos. J. 1: 378. 1819, *nom. cons.*

Didymocarpus fischeri Gamble, Bull. Misc. Inform. Kew 1923: 117. 1923 & Fl. Pres. Madras 989(695). 1924.

Scapigerous herbs. Leaves simple, 6-12 x 5-8 cm, broadly elliptic, acute, irregularly crenate; lateral nerves 5 or 6 pairs, prominently reticulate, densely bullate above with cluster of hairs, pubescent below, attenuate to the base; petiole 1-6 cm long, 7 mm broad; younger leaves sessile. Cymes dichotomous, glandular hairy, 8 cm across; pedicels ca. 13 mm long. Flowers several. Sepals 3 x 1 mm, oblong, obtuse, basely united. Corolla blue, 15 mm long, curved, lobes orbicular, 7 mm across, glandular-hairy outside. Staminodes 2, linear, curved; ovary glandular hairy; stigma spoon-shaped, papillose..

Ambalappara, *KJD 26056*

Fl. & Fr.: June-October

Distribution: Rare in Evergreen forests of Ambalappara.

EPITHEMA Blume, Bijdr. 737. 1826.

Epithema carnosum (G. Don) Benth. **var. hispida** Clarke in A. & C. DC., Monogr. Phan. 5: 178. 1883 & Hook.f., Fl. Brit. India 4: 369. 1884; Gamble, Fl. Pres. Madras 992(697). 1924; Ansari, Fl. Kasaragod Div. 267. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 325. 1988.

Erect herbs; stems succulent, pilose. Leaves simple, opposite and alternate, 7-14 x 6-10 cm, ovate, obtuse at apex, rounded or cordate at base, upper ones sessile, hairy above and below; nerves 6-8 pairs. Flowers small, in terminal or axillary scorpioid cymes; pedicels 6 mm long, hairy. Calyx 5 mm long, campanulate, lobes 5, acuminate, united above the middle. Corolla 7 mm long, 2-lipped, lobes 5, subequal, white. Stamens 2, free; staminodes 3 or 4. Ovary ovoid, 1-celled, ovules many, placenta parietal, not intruded; style 1, stigma minute. Capsule 5 x 3 mm, ovoid, circumscissile; seeds brown, twisted, ridged.

Crossway, *NS & KJD 31922*

Fl. & Fr.: July-October

Distribution: Fairly common in Evergreen forests of Moonamthode, Crossway and Chelachode; Semi-evergreen forests of Paripode. Endemic to Peninsular India.

JERDONIA Wight, Ic. t. 1352. 1848.

Jerdonia indica Wight, Ic. t. 1352. 1848; Hook. f., Fl. Brit. India 4: 366. 1884; Gamble, Fl. Pres. Madras 991(696). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 325. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 597. 2009.

Erect scapigerous herbs, to 25 cm tall. Leaves simple, crowded at the base, up to 13 x 5.5 cm, elliptic-oblong, obtuse, subcordate at base, glabrous above, rusty villous beneath. Flowers ca. 2 cm long, pale lilac with red tinge, in scapes to 14 cm long; bracts small. Calyx 5-partite, the lobes lanceolate, long-pilose. Corolla-tube elongate, swollen upwards; limb oblique, 2-lipped, upper lip emarginate, lower 3-lobed. Stamens 4 perfect; filaments dilated, the lower pair with a

descending spur; anthers 2-celled, cohering at their apices. Disk cup-shaped. Ovary ovoid; style linear; stigma peltate. Fruit an ovoid, loculicidal, 2-valved villous capsule with 4 many-seeded placentae; seeds funicled, ellipsoid, grooved at the sides.

Chavachi, NS & KJD 31924

Fl. & Fr.: March-October

Distribution: Common in Evergreen forests of Chelachode, Chavachi and Kattikari. Endemic to southern Western Ghats.

RHYNCHOGLOSSUM Blume, Bijdr. 741. 1826.

1a. Corolla 1-2.5 cm *R. notonianum*

1b. Corolla 0.8-1 cm *R. obliquum* var. *parviflorum*

Rhynchoglossum notonianum (Wall.) Burt, Notes Roy. Bot. Gard. Edinb. 24: 170. 1962 & Rev. Handb. Fl. Ceylon 3: 99. 1981; Manilal & Sivar., Fl. Calicut 209. 1982; Ansari, Fl. Kasaragod Div. 268. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 326. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 597. 2009. *Wulfenia notoniana* Wall., Tent. Fl. Nepal. 46. 1826. *Klugia notoniana* (Wall.) A. DC. in DC., Prodr. 9: 276. 1845; Hook. f., Fl. Brit. India 4: 366. 1889; Gamble, Fl. Pres. Madras 990(696). 1924.

Fleshy glabrous herbs; stems thick. Leaves simple, alternate and opposite, to 17 x 11 cm, ovate, acute at apex, cordate at base, inequilateral, acute on one side; nerves 17-20 pairs, regular, prominent below. Flowers in terminal racemes; bracts ovate, acute; pedicels to 5 mm long. Calyx deeply 5-lobed, to 8 mm long, lanceolate, dorsally winged, wing of one sepal larger than others. Corolla blue, 1-2.5 cm long, bilabiate, tube white, upper lip smaller, 2-lobed, lower lip broad. Stamens 4, anthers connate in pairs. Ovary 1-celled, ovules many, on 2-parietal placentae; style slender; stigma oblique. Capsule 6 x 4 mm, ovoid, loculicidal; seeds many, reticulate.

Moonamthode, KJD 31825

Fl. & Fr.: July-December

Distribution: Common in Evergreen forests of Moonamthode, Meenmutty, Chavachi and Pottichapara also in Semi-evergreen forests of Paripode.

Rhynchoglossum obliquum Blume var. **parviflorum** Clarke in A. & C. DC., Monogr. Phan 5: 162. 1883; Hook. f., Fl. Brit. India 4: 367. 1884; Gamble, Fl. Pres. Madras 990(696). 1924; Ansari, Fl. Kasaragod Div. 268. 1985.

Erect, simple or branched, somewhat flaccid, annual herbs; stems terete, shortly hairy or subglabrous. Leaves simple, alternate and opposite, 2-15 x 1-7 cm, ovate-elliptic to oblong, acute or acuminate at apex, obliquely subcordate at base, subentire-repand, glabrous, punctate beneath, subsessile or on 0.5 cm long petioles, in equal pairs, opposite, seemingly alternate. Flowers in terminal, second racemes, 1 to 2-nate; bracts persistent; pedicels pendulous, pubescent with short hairs, 0.15-3 cm long. Calyx 0.4-0.6 cm long, divided halfway down, short-hairy, lobes ovate-triangular, acute, winged dorsally, ciliate, 0.2-0.3 x 0.08-0.1 cm. Corolla bluish-violet, 0.8-1 cm long, glabrous within. Staminal filaments 0.4-0.6 cm long. Capsule enclosed by the calyx, ovoid-ellipsoid, 0.4 cm across.

Moonamthode, KJD 31596

Fl. & Fr.: July-November

Distribution: Fairly common in Evergreen forests of Moonamthode, Meenmutty and Chavachi.

RHYNCHOTECHUM Blume, Bijdr. 775. 1826.

Rhynchotechum permolle (Nees) Burt, Notes Roy. Bot. Gard. Edinb. 24: 39. 1962; Ramach. & V.J. Nair, Fl. Cannanore Dist. 326. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 598. 2009. *Isanthera permollis* Nees, Trans. Linn. Soc. London 17: 82. 1834; Hook. f., Fl. Brit. India 4: 372. 1884; Gamble, Fl. Pres. Madras 992(697). 1924.

Subshrubs, to 50 cm high, densely golden-brown tomentose. Leaves simple, alternate, to 30 x 11 cm, oblanceolate, acute, attenuate at base, serrulate; nerves 17-20 pairs, regular. Flowers in axillary cymes, densely packed, shortly pedicelled; bracts ovate. Calyx 5-partite, lobes 7 mm long, lanceolate. Corolla white ca 12 mm across, tube short, lobes rotate, obovate, glabrous. Stamens 4, equal, adnate to the base of the corolla; filaments short, arcuate; anthers 1-celled. Ovary ovoid; ovules many; style stout, stigma capitate. Berry globose, 6 mm across, white; seeds numerous very small, ellipsoid.

Kariyenkappu, *KJD 31847*; Kattikari, *KJD 31890*

Fl. & Fr.: August-March

Distribution: Common in Evergreen forests of Kattikari, Chavachi, Moonamthode and Meenmutty.

BIGNONIACEAE

- 1a. Leaves bi or tri pinnate..... *Oroxylum*
- 1b. Leaves simple pinnate 2
- 2a. Capsule tetragonous; flowers 1.5 cm across..... *Stereospermum*
- 2b. Capsule compressed, winged; flowers 5 cm across *Pajanelia*

OROXYLUM Ventenat, Decne., Gen. Nov. 8. 1808.

Oroxylum indicum (L.) Benth. ex Kurz, For. Fl. Burma 2: 238. 1877; Hook. f., Fl. Brit. India 4: 378. 1884; Gamble, Fl. Pres. Madras 994(698). 1924; Manilal & Sivar., Fl. Calicut 210. 1982; Ansari, Fl. Kasaragod Div. 269. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 327. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 600. 2009. *Bignonia indica* L., Sp. Pl. 625. 1753.

Medium sized trees, to 12 m high; bark 5-6 mm thick, surface brownish-grey; bole smooth. Leaves compound, 2-3 pinnate, pinnae 5-9; imparipinnate, opposite; leaflets 3-5 in each pinnae, opposite, 7.5-15 x 4-9 cm, ovate, apex acuminate, base cordate, oblique or truncate, margin entire, glabrous, chartaceous; rachis 60-100 cm, stout, glabrous; lateral nerves, 4-6 pairs, pinnate, prominent, puberulent beneath; intercostae reticulate. Flowers bisexual, in lax terminal racemes, reddish-purple outside, pinkish-yellow within, racemes to 30-50 cm long; pedicels 1-2 cm long. Calyx 2.5 cm long, campanulate, coriaceous, glabrous, limb truncate or obscurely toothed. Corolla ca 10 cm long, fleshy, campanulate, 5-lobed, lobes 3 cm long. Stamens 5, perfect, the posterior one shortest, filaments inserted below the base of the tube, filaments hairy at base; connective with a short mucrone. Ovary subsessile, contracted at the base; ovules many; style slender; stigma 2-lobed. Fruit a capsule, 40-75 x 5-8 cm, 2 valved, compressed, tapering at both end; seeds thin, papery, 5-6 cm long, winged all around except at base.

Kariyenkappu, *KJD 31832*

Fl. & Fr.: July-December

Distribution: Rare in Plantations.

PAJANELIA de Candolle, Bibl. Univ. Genev. 17: 130. 1838.

Pajanelia longifolia (Willd.) K. Schum. in Engl. & Prantl, Naturl. Pflanzenfam. 4(3b): 244. 1895; Manilal & Sivar., Fl. Calicut 210. 1982; Ansari, Fl. Kasaragod Div. 270. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 327. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 600. 2009. *Bignonia longifolia* Willd., Sp. Pl. 3: 306. 1800. *Pajanelia rheedei* Wight, Ic. t.t. 1343,1344. 1848; Hook. f., Fl. Brit. India 4: 384. 1884; Gamble, Fl. Pres. Madras 1000(702). 1924.

Deciduous trees, to 20 m high, bole unbranched to a considerable height; bark 2-3 cm thick, pale grey, shining, pustular lenticels in vertical rows. Leaves compound, imparipinnate, leaflets 7-17, opposite, 17-25 x 7-12 cm, ovate, apex acuminate, base oblique, margin entire, glabrous, chartaceous; rachis to 100 cm, glabrous, stout; petiolule 3-7 mm, channelled above, glabrous; lateral nerves 6-10 pairs, pinnate, prominent; intercostae reticulate. Flowers bisexual, crimson-purple, white within, in large terminal racemose panicles. Calyx 4.5 cm long, campanulate, lobes 5, rusty tomentose. Corolla 9 x 8 cm, tube 6-8 cm long, base narrow, broadly ventricose, lobes 5, subequal, crisped. Stamens 4, free, didynamous with a rudimentary fifth, filaments arching, slender; anthers equal, oblong. Ovary 0.5-1 cm long, 2-celled, oblong; ovules many; placenta thin at centre; style 6 cm long; stigma 2 lobed. Fruit a capsule, 2 valved, 30-45 x 5-7.5 cm, brown, winged on both margins, compressed, smooth; seeds 2.5 x 1.5 cm, flat, papery, winged on both sides.

Kariyenkappu, KVB 31578

Fl. & Fr.: January-June

Distribution: Fairly common in Plantations of Kariyenkappu and Evergreen forests of Chavachi.

STEREOSPERMUM Chamisso, Linnaea 7: 720. 1833.

Stereospermum colais (Buch.-Ham. ex Dillw.) Mabb., Taxon 27: 553. 1979, **var. colais**; Ansari, Fl. Kasaragod Div. 270. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 327. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 602. 2009. *Bignonia colais* Buch.-Ham. ex Dillw., Rev. Hort. Malab. 28. 1839. *Stereospermum tetragonum* DC., Prodr. 9: 210. 1845; Gamble, Fl. Pres. Madras 998(701). 1924. *Stereospermum chelonoides* sensu Wight, Ic. t. 1341. 1845, non (L. f.) DC.1838; Hook. f., Fl. Brit. India 4: 383. 1884.

Large trees, to 30 m high; bole rough; bark 1.2 cm thick, pale greyish-brown, transversely rugose, exfoliations irregular. Leaves compound, imparipinnate, opposite, leaflets 7-13, opposite, 4.5-13 x 2-4.5 cm, elliptic-lanceolate, elliptic-oblong, ovate or obovate, apex acuminate or caudate acuminate, base oblique, acute or obtuse, margin entire or serrate, glabrous above and puberulent beneath, chartaceous; rachis 10-21 cm long, slender, puberulent, swollen at base; petiolule 7-12 mm, slender, puberulent, grooved above; lateral nerves 6-10 pairs, pinnate, puberulent beneath, prominent; intercostae reticulate. Flowers bisexual, in terminal lax panicles. Calyx 6 mm long, campanulate, shallowly lobed, lobes 3-5, dorsal lobe much larger than the others, puberulent, tube 1.2-1.5 cm, obtuse. Corolla 2 x 1.5 cm across, yellow with red streaks, infundibuliform, pubescent inside, base glandular hairy, lobes 5, subequal, crisped. Stamens 4, didymous, divaricate; filaments unequal, smaller ones 1-1.2 cm, larger to 2.2-2.5 cm, hairy below; anthers divergent, ca. 5 mm, oblong, included, staminodes present. Ovary sessile, oblong, superior, 2-celled, syncarpous; many ovuled, 1 seriate; style slender; stigma 2, spoon shaped. Fruit a capsule, to 35 x 0.7 cm, subtetragonus,

tapering at apex and base, epicarp thin, spirally splitting; seeds 8 mm long, wings obtuse at both ends.

Chavachi, NS & KVB 31319

Fl. & Fr.: February-October

Distribution: Fairly common in plantations of Kariyenkappu and Evergreen forests of Chavachi.

PEDALIACEAE

SESAMUM L., Sp. Pl. 2: 634. 1753.

Sesamum orientale L., Sp. Pl. 634. 1753; Ansari, Fl. Kasaragod Div. 272. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 329. 1988. *Sesamum indicum* L., Sp. Pl. 634. 1753; Hook. f., Fl. Brit. India 4: 387. 1884; Gamble, Fl. Pres. Madras 1002(704). 1924; Manilal & Sivar., Fl. Calicut 212. 1982.

Erect pubescent herbs to 1.2 m tall; young shoots 4-angled. Leaves simple, opposite below and alternate above, basal leaves often 3-foliolate, 6-12 x 3-6 cm, elliptic to lanceolate, base rounded, margin entire or irregularly crenate-serrate, apex acute, pubescent on both sides; petiole to 4.5 cm long. Flowers axillary, solitary; pedicel to 3 mm long. Calyx-lobes 5, ca 7 mm long, lanceolate, pubescent. Corolla white, 3 cm long, tubular ventricose, 2-lipped, lobes 5. Stamens, didynamous; anthers oblong. Ovary 3 mm long, pubescent. Capsule 1.5-2 x 0.4-0.6 cm, oblong, compressed, beaked, medianly grooved, pubescent; seeds c. 2 mm long, obovate, compressed, black, smooth.

Kariyenkappu, NS & KVB 31426

Fl. & Fr.: July-December

Distribution: Rare in earlier Settlements.

ACANTHACEAE

1a. Staminal filaments monadelphous, decurrent in to sheath.....	Strobilanthes
1b. Staminal filaments free or connate in pairs.....	2
2a. Fertile stamens 4.....	3
2b. Fertile stamens 2, with or with out staminodes.....	7
3a. Seeds supported on retinacula.....	4
3b. Seeds not supported on retinacula	Thunbergia
4a. Corolla lobes equal or subequal, spreading.....	5
4b. Corolla 2-lipped.....	6
5a. Ovules 2 in each cell.....	Aystasia
5b. Ovules 3 or more.....	Dipteracanthus
6a. Bracteoles present, similar to bract, calyx lobes equal	Lepidagathis
6b. Bracteoles absent, one of the calyx lobe bract like	Phaulopsis
7a. Ovules 3-10 per locule. Seeds more than 4 per capsule	8
7b. Ovules 2 or 1 per locule, seeds 1-2 per capsule.....	10
8a. Capsule compressed, seeds ovoid or angular	9
8b. Capsule cylindric or terete, seeds compressed	Gymnosatchyum
9a. Flowers in whorls among axillary cladodes.....	Haplanthodes
9b. Flowers in racemes, panicles or spikes	Andrographis
10a. Corolla lobes 5, subequal.....	11
10b. Corolla lobes 5, 2-lipped	12
11a. Calyx lobes 4, outer pair larger enclosing the inner.....	Barleria
11b. Calyx lobes 5, all equal or subequal.....	13
12a. Flowers axillary, solitary or 2-flowered racemes	Dipteracanthus
12b. Flowers in linear spikes or heads	Eranathemum
13a. Anthers cells unequal, appendaged.....	14
13b. Anther cells equal, not appendaged	15
14a. Both anther cells basically appendaged	Justicia
14b. Only lower anther cell appendaged	Rungia

- 15a. Corolla white, upper lip much narrower than other..... Rhinacanthus
 15b. Corolla pink, upper lip nearly as broad as lower 16
 16a. Anther cells rotund, decurrent..... Peristrophe
 16b. Anther cells reniform, distinct Dicliptera

ANDROGRAPHIS Wall. ex Nees in Wall., Pl. Asiat. Rar. 3: 77, 116. 1832.

- 1a. Staminal filaments glabrous, inflorescence congested *A. neesiana*
 1b. Staminal filaments hairy, panicle lax *A. paniculata*

Andrographis neesiana Wight, Ic. t. 1561. 1850, **var. neesiana**; Hook. f., Fl. Brit. India 4: 504. 1884; Gamble, Fl. Pres. Madras 1049(735). 1924; Mohanan & Sivad., Fl. Agasthyamala 503. 2002.

Herbs, branches strigose. Leaves simple, opposite, 2-4 x 2 cm, ovate-elliptic, acute at both ends, glabrous, ciliate, nearly sessile; nerves 5 pairs. Panicle 2-5 x 4 cm, congested, terminal, strigose; flowers densely arranged. Calyx lobes 6 mm long, linear, acuminate, glandular hairy. Corolla 14 mm long, brownish-purple, tube not ventricose, upper lip emarginate; lobes of lower lip obtuse, hairy. Stamens 2, filaments broadened below; anthers attenuate at base; style hairy. Capsule 16 x 3 mm, oblong, acute, hairy; seeds 6, glabrous.

Ambalappara, NS & KJD 31975

Fl. & Fr.: September-February

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Andrographis paniculata (Burm. f.) Wall. ex Nees in Wall., Pl. Asiat. Rar. 3: 116. 1832; Hook. f., Fl. Brit. India 4: 501. 1884; Gamble, Fl. Pres. Madras 1048(734). 1924; Manilal & Sivar., Fl. Calicut 214. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 331. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 606. 2009. *Justicia paniculata* Burm. f., Fl. Ind. 9. 1768. *Andrographis subspathulata* Clarke in Hook. f., Fl. Brit. India 4: 502. 1884.

Slender herbs; branches glabrous. Leaves simple, opposite, 9 x 1.5 cm, elliptic, acuminate at apex, base acute, decussate, glabrous. Panicle terminal and upper axillary, glandular-hairy; flowers many, distant. Calyx lobes 3 mm long, linear, hairy, connate at base. Corolla 14 mm long, pink or white with purple dots, tube ventricose, hairy, upper lip entire, midlobe of lower lip broader than laterals, acute, glandular-hairy. Ovary puberulus, style hairy. Capsule 20-30 x 3 mm, oblong, acute, hairy; retinacula spoon shaped; seeds 8, glabrous.

Kariyenkappu, NS & KVB 31426

Fl. & Fr.: March-December

Distribution: Rare along the margins of forests.

ASYSTASIA Blume, Bijdr. 796. 1826.

Asystasia dalzelliana Sant., Kew Bull. 1948: 276. 1948; Manilal & Sivar., Fl. Calicut 222. 1982; Ansari, Fl. Kasaragod Div. 275. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 332. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 606. 2009. *Asystasia violacea* Dalz. ex Clarke in Hook. f., Fl. Brit. India

4:494.1884; Gamble, Fl. Pres. Madras 1063(744). 1884, non Dalz. 1850. *Asystasia coromandelina* Curtis, Bot. Mag. t. 4248. 1846, non Wight.

Erect or diffuse herbs; branches 4-angled, tomentose. Leaves simple, opposite, 2-3.5 x 1.5-2.2 cm, broadly ovate to elliptic, apex acuminate, base cuneate; lateral nerves close, pubescent; petiole to 1 cm long. Flowers in terminal or subterminal secund racemes. Calyx lobes 5, 5-6 mm long, lanceolate. Corolla lilac or blue; tube to 2.5 cm long, puberulous without; lobes 5, subequal, spreading, orbicular. Stamens 4; anthers c. 3 mm long. Style to 1.5 cm long, puberulous below. Capsule to 1.5 cm long, calvate, stalked, pubescent, beaked; seeds 2-4, 0.5 mm cross, orbicular or angular.

Pothurumi, NS & KJD 25511

Fl. & Fr.: September-January

Distribution: Common in Evergreen forests.

BARLERIA L., Sp. Pl. 636. 1753.

1a. Inflorescence terminal spike *B. courtallica*

1b. Inflorescence terminal or axillary cyme *B. involucrata*

Barleria courtallica Nees in DC., Prodr. 11: 226. 1847; Hook. f., Fl. Brit. India 4: 489. 1884; Gamble, Fl. Pres. Madras 1060(743). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 333. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 608. 2009.

Subshrubs, branchlets glabrous. Leaves simple, opposite, 15-20 x 6-8 cm, elliptic, apex acuminate, base attenuate, glabrous; nerves 7-9 pairs; petiole 1-4 cm long. Spikes terminal, 3-10 cm long; bracts and bracteoles similar, 5 mm long, lanceolate; flowers closely arranged. Sepals unequal, outer 8-20 x 6.5 mm, elliptic, acuminate, pubescent; inner 15 mm long, linear, acuminate, hairy. Corolla 4-5 cm long, tube and throat yellow or white; lobes 1.5 cm long, obovate, blue. Stamens unequal, 2 larger and 2 smaller, staminal filaments villous at base. Capsule 2.3 x 0.9 cm, elliptic, glabrous; seeds 4, 5 x 5 mm, orbicular, hairy, brown.

Meenmutty road, KVB 31518

Fl. & Fr.: January-May

Distribution: Fairly common in Evergreen forests of Meenmutty, Chavachi and Pothurumi also in Semi-evergreen forests of Paripode. Endemic to Western Ghats.

Barleria involucrata Nees in Wall., Pl. Asiat. Rar. 3: 92. 1832 & in DC., Prodr. 11: 232. 1847, **var. involucrata**; Hook. f., Fl. Brit. India 4: 485. 1884; Gamble, Fl. Pres. Madras 1060(742). 1924; Manilal & Sivar., Fl. Calicut 221. 1982.

Subshrubs; branches terete, appressed hairy. Leaves simple, 8-15 x 2.5-7 cm, elliptic-lanceolate, acuminate, base tapering; lateral nerves 7-9 pairs; petiole 1-3 cm long. Flowers in axillary cymes, often forming large terminal panicles; bracteoles 2-3.5 cm long, linear lanceolate. Outer calyx lobes, ovate lanceolate, 3 cm long; inner 2 cm long, narrowly lanceolate, acute, pubescent out side. Corolla blue with reddish-purple tube, 2 cm long; lobes obovate, obtuse. Stamens 2 fertile. Capsules elliptic, 2.5 x 0.7 cm; seeds 4, broadly ellipsoid, obtuse, silky hairy.

Mullenpara, NS & KJD 31927

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Mullenpara.

DICLIPTERA A. Juss., Ann. Mus. Natl. Hist. Nat. 9: 267. 1807. *nom. cons.*

- 1a. Inflorescence bracts in opposite pairs 2
1b. Inflorescence bracts not opposite, unequal *D. paniculata*
2a. Cymes peduncled, bracts acute *D. foetida*
2b. Cymes sessile, bracts obtuse *D. cuneata*

Dicliptera cuneata Nees in Wall., Pl. Asiat. Rar. 3: 111. 1832; Hook. f., Fl. Brit. India 4: 552. 1884; Gamble, Fl. Pres. Madras 1073(752). 1924; Anil Kumar et al., Fl. Pathanamthitta 377. 2005.

Subshrubs. Leaves simple, opposite, 5-7 x 3-5 cm, elliptic, apex acuminate, base rounded or cuneate, hispid; petiole 2-3 cm long. Flowers in sessile or shortly peduncled, subcapitate cymes; bracts 18 x 12 mm, obovate, obtuse, mucronate, hispid; bracteoles 5 mm long, lanceolate, subulate. Sepals 7 mm long, lanceolate, hispid. Corolla pink, 8 mm long, tube slender. Stamens 2, filaments hairy. Seeds glochidiate-papillose

Pookundu, KVB 31208

Fl. & Fr.: November-February

Distribution: Common in Semi-evergreen forests of Pookundu. Endemic to Peninsular India.

Dicliptera foetida (Forssk.) Blatt., Rec. Bot. Surv. Ind. 8: 361. 1921; Sasidh., Fl. Periyar Tiger Reserve 294. 1998. *Justicia foetida* Forssk., Fl. Aeg.-Arab. 5. 1775. *Dicliptera zeylanica* Nees in DC., Prodr. 11: 474. 1847; Hook. f., Fl. Brit. India 4: 552. 1884; Gamble, Fl. Pres. Madras 1073(752). 1924; Vajr., Fl. Palghat Dist. 347. 1990.

Shrubs, 1-2 m high; stems terete. Leaves simple, opposite, 7 x 3.5 cm, elliptic, acute at both ends, glabrous except the nerves below; nerves 5 pairs; petiole 2.5 cm long. Flowers in peduncled axillary cymes; bracts 15 x 13 mm, deltoid, cuspidate. Calyx lobes 4 mm long, lanceolate, acuminate. Corolla pink, 20 mm long, bilabiate; lobes obtuse. Stamens 2, filaments hairy, anthers in two levels. Capsule clavate, widened above; seeds hirtus.

Pookundu, NS & KJD 25557

Fl. & Fr.: December-April

Distribution: Common in Semi-evergreen forests of Pookundu to Narikkadavu.

Dicliptera paniculata (Forssk.) I. Darbysh. in I. Darbysh. & Vollesen, Kew Bull. 62: 122. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 621. 2009. *Dianthera paniculata* Forssk., Fl. Aeg.-Arab. 7. 1775. *Dianthera malabarica* L. f., Suppl. Pl. 85. 1782, *nom illeg.* *Peristrophe bicalyculata* (Retz.) Nees in Wall., Pl. Asiat. Rar. 3: 113. 1832; Hook. f., Fl. Brit. India 4: 554. 1885; Gamble, Fl. Pres. Madras 1084(759). 1924; Manilal & Sivar., Fl. Calicut 215. 1982. *Peristrophe paniculata* (Forssk.) Brummitt, Kew Bull. 38: 451. 1984; Ansari, Fl. Kasaragod Div. 287. 1985.

Erect herbs, stem 6-angular, hispid. Leaves simple, opposite, 4.5-6 x 2-3 cm, ovate, apex acute, base rounded or truncate, glabrescent above and tomentose below. Flowers in axillary trichotomous cymes; pedicels to 2 cm; bracts 2, unequal, 11 x 8 mm, bracteoles 4, 6 mm, linear, hirsute. Calyx deeply 5-partite, lobes 4 mm, linear. Corolla pink, tube 5 mm, hairy, 2-lipped, upper entire, lower 3-lobed, lobes 7 mm. Stamens 2, filaments 5 mm, hairy,

anther cells short, muticous. Ovary 1 mm, oblong. Capsule ellipsoid, tomentose; seeds 4, glochidiate-papillose.

Kariyenkappu, *KVB 31766*

Fl. & Fr.: December-February

Distribution: Along the boundaries of forests.

DIPTERACANTHUS Nees in Wall., Pl. Asiat. Rar. 3: 75, 81. 1832.

Dipteracanthus prostratus (Poir.) Nees in Wall., Pl. Asiat. Rar. 3: 81. 1832; Manilal & Sivar., Fl. Calicut 225. 1982; Ansari, Fl. Kasaragod Div. 27. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 334. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 610. 2009. *Ruellia prostrata* Poir. in Lam., Encycl. 6: 349. 1804; Hook. f., Fl. Brit. India 4: 411. 1884; Gamble, Fl. Pres. Madras 1017(714). 1924. *Ruellia prostrata* Poir. var. *dejecta* (Nees) Clarke in Hook. f., Fl. Brit. India 4: 412. 1884. *Dipteracanthus dejectus* Nees in Wall., Pl. Asiat. Rar. 3: 82. 1832.

Diffuse herbs, rooting at lower nodes; stems villous. Leaves simple, opposite, to 6 x 4 cm, ovate, acute, entire, base acute or obtuse; petiole 2-3 cm long. Flowers axillary, 2 or 3 together; bracts absent; bracteoles foliar, 1.5 x 1 cm, ovate. Calyx 5-partite, lobes 10 mm long, linear, ciliate. Corolla white or pinkish-white, tube 8 mm long, lobes subequal, 1 cm long, obovate. Stamens 4, didynamous, filaments connate below. Ovary glabrous, style densely hairy. Capsule 1.5 x 0.6 cm, linear oblong, slightly pubescent; seeds 16-20, orbicular, compressed, marginate, smooth.

Paripode, *KVB 31570*

Fl. & Fr.: October-April

Distribution: Along the boundaries of forests.

ERANTHEMUM L., Sp. Pl. 9. 1753.

Eranthemum capense L., Sp. Pl. 9. 1753; Hook. f., Fl. Brit. India 4: 525. 1885; Gamble, Fl. Pres. Madras 1078(720). 1924; Manilal & Sivar., Fl. Calicut 216. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 335. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 610. 2009. *Eranthemum montanum* Roxb., Fl. Ind. 1: 100. 1820; Gamble, Fl. Pres. Madras 1025(720). 1924. *Justicia montana* Roxb., Pl. Corom. t. 176. 1798. *Daedalacanthus montanus* (Roxb.) Anders. in Thw., Enum. Pl. Zeyl. 229. 1860.

Subshrubs, to 1m high; stem jointed, pubescent. Leaves simple, opposite, 4-14 x 2-5 cm, broadly elliptic, attenuate, acuminate, entire or wavy, glabrous, dark green; lateral nerves 2-5 pairs; petioles 0.5-3 cm long. Inflorescence terminal or axillary, dense panicle of spikes; peduncles 3-9 cm long, glandular, pubescent; bracts linear-lanceolate, acuminate, 1-2 cm long, 2-4 mm wide, hirsute; bracteoles linear-lanceolate, 4-6 x ca 1 mm. Calyx-lobes 5, shortly connate, filamentous, 4-8 mm long, glandular hairy. Corolla blue; tube narrow, 2-2.5 cm long, pubescent; limb subequally 5-lobed, twisted to the left in bud, ovate, 1-1.5 cm across. Stamens 2, attached at the throat of the tube; filaments 2-5 mm long; anther-thecae oblong; 2-3 mm long; ovary oblong, 2-4 mm across; style 2-3 cm long; stigma dilated. Capsules oblong, 1.5-2.5 cm long, 4-6 mm wide; seeds 4, compressed, 2-3 mm thick, hygroscopically hairy.

Paripode, *KJD 26329*

Fl. & Fr.: January-March

Distribution: In forest plantations and deciduous forests.

GYMNOSTACHYUM Nees in Wall., Pl. Asiat. Rar. 3: 76, 106. 1832.

- 1a. Plants scapigerous; flowers in terminal peduncled cymes *G. febrifugum*
1b. Plants cauline; flowers axillary *G. latifolium*

Gymnostachyum febrifugum Benth., Flora 32: 558. 1849; Hook. f., Fl. Brit. India 4: 508. 1884; Gamble, Fl. Pres. Madras 1053(738). 1924; Ansari, Fl. Kasaragod Div. 279. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 336. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 612. 2009. *Gymnostachyum alatum* Wight, Ic. t. 1525. 1850.

Scapigerous herbs; stems very short. Leaves simple, radical, 7 x 4 cm, ovate, obtuse at apex, obtuse and decurrent at base; nerves 3-4 pairs, hirsute below; petiole 3-9 cm long. Scape to 30 cm long, solitary or few, simple or branched. Flowers solitary or 2-4 together; bracts and bracteoles minute. Calyx 5-partite, lobes 3 mm long, glabrous. Corolla pink, 2.5 cm long, yellow at mouth, lobes 5, subequal. Stamens 2, included; anthers pubescent. Capsule linear, 25 x 2 mm, glabrous; seeds 16-20, orbicular, golden brown.

Valayamchal, *KJD 26335*

Fl. & Fr.: September-December

Distribution: Common in Semi-evergreen forests of Valayamchal to Kurukathode. Endemic to southern Western Ghats.

Gymnostachyum latifolium (Dalz.) Anders. **var. decurrens** Gamble, Fl. Pres. Madras 1053(738). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 337. 1988.

Subshrubs to 80 cm tall, stem erect subquadrangular. Leaves simple, opposite, 7.5-18 x 5-15 cm. broadly ovate, acute at apex, acuminate at base and decurrent on the long petiole; lateral nerves 10-14 pairs, equally spaced. Flowers in axillary racemes or panicles; bracteoles 2 mm long, lanceolate. Calyx 6 mm long, lobes 5, linear, acute. Corolla 2.5 cm long, blue, yellow at the tip of lobes, 2-lipped, upper lip 8 mm long, 2-lobed; lower lip 3 partite to the base. Stamens 2, exserted, glabrous. Capsule 2 cm long, linear, striate; seeds ca. 24, suborbicular, hairy when wet.

Kannadivechakunnu, *NS & KJD 25566*; Croosway, *NS & KJD 31914*

Fl. & Fr.: October-January

Distribution: Common in Evergreen forests of Cross way, Chavachi, Kattikari, Meenmutty and Kannadivechakunnu. Endemic to Western Ghats.

HAPLANTHODES O.Kuntze in Post & Kuntze, Lexic. 265. 1903.

Haplantodes neilgherryensis (Wight) Majumdar, Bull. Bot. Soc. Bengal 25: 76. 1971; Panigrahi & Das, Bull. Bot. Surv. India 23: 201. 1981; Ansari, Fl. Kasaragod Div. 280. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 612. 2009. *Haplantus neilgherryensis* Wight, Ic. t. 1556. 1850; Hook. f., Fl. Brit. India 4: 507. 1884; Gamble, Fl. Pres. Madras 1052(737). 1924. *Haplantus tentaculatus* Nees. **var. neilgherryensis** (Wight) Clarke in Hook. f., Fl. Brit. India 4: 507. 1884. *Bremekampia neilgherryensis* (Wight) Sreem., Bull. Bot. Surv. India 6: 323. 1965.

Profusely branched herbs, branches quadrangular, glabrous. Leaves simple, opposite, 4-7 x 2-3 cm, elliptic, acuminate at both ends, glabrous, attenuate and decurrent at base into a petiole of 4-9 cm long. Flowers whorled in terminal, to 5 cm long, cylindrical spikes, densely covered with hairy cladodes; bracts and bracteoles minute. Calyx 2 mm long, lobes filiform, hairy. Corolla 10 mm long, pink; upper lip 2-lobed and lower lip 3-lobed, hairy. Stamens 2, free, anthers unequal, appendaged. Ovary oblong, cells 4-6 ovuled,

style slender, stigma linear. Capsule 7 mm long, oblong; seeds 6-12, thinly hairy.

Moonamthode, KVB 31542

Fl. & Fr.: January-March

Distribution: Fairly common in Evergreen forests of Moonamthode, Semi-evergreen forests of Paripode and Plantations of Kariyenkappu.

JUSTICIA L., Sp. Pl. 15. 1753.

- 1a. Calyx lobes 5..... 2
- 1b. Calyx lobes 4 6
- 2a. Corolla 2 cm or more long 3
- 2b. Corolla less than 1.5 cm long 4
- 3a. Shrubs to 3 m tall; bracts elliptic, 2 cm long J. adhatoda
- 3b. Shrubs less than 1.5 m tall; bracts ovate-oblong, 6 mm long..... J. santapau
- 4a. Bracts white with green nerves; stem obtusely 4-angled 5
- 4b. Bracts green; stem terete..... J. wynaadensis
- 5a. Leaves petioled, elliptic, acuminate at apex J. betonica
- 5b. Leaves sessile, oblong-lanceolate, obtuse J. nilgherrensis
- 6a. Spikes to 2.5 cm long; bracts elliptic..... J. procumbens
- 6b. Spikes to 5 cm long; bracts linear-lanceolate J. japonica

Justicia adhatoda L., Sp. Pl. 15. 1753; Ansari, Fl. Kasaragod Div. 283. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 340. 1988. *Adhatoda zeylanica* Medic., Hist. & Commen. Acad. Elect. Sci. Theod.-Palat. 6: 393. 1790; Manilal & Sivar., Fl. Calicut 217. 1982. *Adhatoda vasica* Nees in Wall., Pl. Asiat. Rar. 3: 103. 1832; Hook. f., Fl. Brit. India 4: 540. 1885; Gamble, Fl. Pres. Madras 1082(758). 1924.

Evergreen, much-branched perennial shrubs with a strong, odour, 1.2-6 m tall. Leaves simple, opposite, 5-30 cm long, elliptic-lanceolate or ovate-lanceolate, apex acute, margins entire, hairy, light green above, dark beneath, leathery; petiole 1-2.5 cm long. Flowers in compact, axillary, pedunculate spikes; peduncles 3-10 cm long; bracts 2 x 1 cm, elliptic, subacute, 6-7 nerved; bracteoles 2 x 0.4 cm, oblong-lanceolate, 1-nerved. Calyx lobes 1 cm long, oblong-lanceolate, 3-nerved. Corolla white with red or yellow-barred throats; upper lip 2 x 1 cm, curved, obtuse, notched; lower as long as the upper lip. Stamens 2, anther cells not tailed; filaments hairy at the base. Ovary pubescent; ovules 2 in each cell; style hairy towards the base. Fruits (capsules) clavate, longitudinally channelled, 1.9-2.2 x 0.8 cm wide, pubescent; seeds globular, glabrous.

Chavachi, KVB 31527

Fl. & Fr.: Throughout the Year

Distribution: Earlier settlements.

Justicia betonica L., Sp. Pl. 15. 1753; Hook. f., Fl. Brit. India 4:525.1885; Gamble, Fl. Pres. Madras 1078(755).1924; Manilal & Sivar., Fl. Calicut 218. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 340.1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 616. 2009. *Adhatoda betonica* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 103. 1832.

Diffusely branched more or less decumbent subshrubs; stem cylindrical, striate, with swollen nodes. Leaves simple, opposite, 5-10 x 3.5-4 cm, ovate, acuminate at apex, acute at base, entire at margins, glabrous; lateral nerves 4-6 pairs. Flowers in terminal spikes; bracts ovate, acute, mucronate, white with green veins, glabrous; bracteoles lanceolate, unequal sided, white with green veins. Calyx 5-partite, to 5 mm long; segments linear-lanceolate. Corolla to 1.25 cm long, pubescent outside, dull white, 2-lipped; upper lip erect, emarginated; lower lip deflexed, 3-lobed. Stamens 4; filaments hairy at the base; lower anther

cell with a long spur. Ovary 2-celled, ovules 2 in each cell; style pubescent. Capsule softly pubescent, broadly clavate; seeds 4, suborbicular, densely tuberculately rugose when wetted.

Paripode, *KJD 25580*

Fl. & Fr.: November-February

Distribution: Fairly common deciduous forests and plantations.

Justicia japonica Thunb., Fl. Jap. 20. 1784; Ramach. & V.J. Nair, Fl. Cannanore Dist. 234. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 616. 2009. *Rostellularia japonica* (Thunb.) Ellis, Bull. Bot. Surv. India 22: 196. 1980 (1982); Swarup. et al., Shola For. Kerala 33. 1998. *Justicia simplex* D. Don, Prodr. Fl. Nepal. 118. 1825; Hook. f., Fl. Brit. India 4: 539. 1885; Gamble, Fl. Pres. Madras 1080(756). 1924. *Rostellularia mollissima* (Nees) Nees in DC., Prodr. 11: 373. 1847. *Rostellaria mollissima* Nees in Wall., Pl. Asiat. Rar. 3: 101. 1832.

Erect or decumbent herbs, branchlets strigose-hispid. Leaves simple, opposite, 2 x 1.5 cm, ovate or linear, apex acute, sparsely scabrous above and strigose below, lateral nerves 5-7 pairs; petiole to 2 mm long. Spike 4-8 cm, cylindrical; bracts and bracteoles ovate, scarious-margined, softly hairy, 4 mm long. Calyx lobes linear, margins scarious, ciliate, 4 mm long. Corolla 4-5 mm long, pubescent out side; upper lip ovate, subtruncate or rounded, 2-fid; lower suborbicular with 3 short rounded lobes. Staminal filament hairy at the base. Capsule pubescent, 4 mm long; seeds 1 mm long, concentrically rugose.

Narikkadavu, *NS & KVB 31459*

Fl. & Fr.: August-February

Distribution: Common in the Sanctuary.

Justicia nilgherrensis (Nees) Wall. ex Anders., J. Linn. Soc. Bot. 7:118.1863; Gamble, Fl. Pres. Madras 1078(755). 1924; Ramach. et al., Journ. Econ. Tax. Bot. 5:140.1984; Ramach. & V.J. Nair, Fl. Cannanore Dist. 341. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 617. 2009. *Adhatoda nilgherrensis* Nees in Wall., Pl. Asiat. Rar. 3: 103. 1832.

Herbs with woody thick rootstock and long roots; stem often numerous, procumbent. Leaves simple, opposite, 3-3.5 x 0.5-1 cm, sessile, oblong-lanceolate, obtuse, soft, greyish green in colour, glabrous, minutely punctuate, finely ciliate along the margin. Flowers in 4-10cm long spikes; bracts 1.5 x 0.7 cm, ovate, very acute, white but with large green nerves; bracteoles nearly as large. Calyx lobes five, 5 mm long, all equal, linear acute, jointed only near the base. Corolla tube slightly longer, broadening suddenly above the base: upper lip 8 mm long, very concave, notched: lower lip 1 cm broad, 3-fid; lobes spreading; middle lobe rounded, slightly broader than the laterals. Capsule 2 cm long, dark purple above, velvety tomentose, laterally contracted at the base; seeds 4 mm across, papillate.

Ambalappara, *NS & KVB 313467; KJD 26314*

Fl. & Fr.: January-March

Distribution: Fairly common in Grasslands of Ambalappara. Endemic to southern Western Ghats.

Justicia procumbens L., Sp. Pl. 15. 1753; Clarke in Hook. f., Fl. Brit. India 4: 539. 1885; Gamble, Fl. Pres. Madras. 1080(756). 1924; Ratheesh Narayanan,

Fl. Stud. Wayanad Dist. 579. 2009.

Rostellularia procumbens (L.) Nees in DC., Prodr. 11: 371. 1847.

Diffuse herbs, 20-25 cm high, profusely branched. Leaves 4-6 x 2-3 cm, ovate, acute at either ends, hispid; nerves 5-6 pairs; petioles ca. 1 cm long, hirtus. Spikes 1-2.5 x 0.8-1 cm, terminal, oblong; bracts oblanceolate, cuspidate, ciliate, with green midrib; bracteoles linear. Flowers many; calyx lobes lanceolate, ciliate. Corolla 6-8 mm long, hairy with pink lines; upper lip broadly ovate, narrowly subquadrate; lower slightly 3-lobed. Staminal filaments glabrous. Ovary glabrous. Capsule glabrous; seeds orbicular, brown, striately rugose.

Kariyenkappu, NS & KVB 31466

Flowering & Fruiting: June-November.

Distribution: Fairly common in Plantations of Kariyenkappu.

Justicia santapau Bennet, J. Bombay Nat. Hist. Soc. 67: 358. 1970; Ramach. & V.J. Nair, Fl. Cannanore Dist. 341. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 618. 2009. *Justicia montana* (Nees) Wall. ex Anders., J. Linn. Soc. Bot. 9: 509. 1867, non Roxb. 1805; Gamble, Fl. Pres. Madras 1078(755). 1924. *Hemichoriste montana* Nees in Wall., Pl. Asiat. Rar. 3: 102. 1832. *Justicia andersonii* Ramam. in Saldanha & Nicolson, Fl. Hassan Dist. 551. 1976.

Shrubs, branches terete or obtusely 4-angled, glabrous. Leaves simple, opposite, 25-40 x 7-10 cm, oblanceolate, apex acute, base attenuate, glabrous, nerves 8 pairs, prominent; petiole 5-6 cm long. Flowers in axillary or terminal peduncled, simple or branched, to 20 cm long spikes; bracts and bracteoles similar, 5 x 1.5 mm, oblong, pubescent. Calyx lobes 6 mm long, lanceolate, puberulus. Corolla white with pink spots, villous at the base between the filaments; upper lip 1.5 cm long, oblong, notched; lower 3-lobed. Ovary densely hairy. Capsule 25 mm long, clavate, glabrous; seeds 4, suborbicular, 4 mm across, rugose, glabrous.

Pothurumi, KVB 31710

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Pothurumi and Kattikari. Endemic to southern Western Ghats

Justicia wynaadensis (Nees) Heyne ex Anders., J. Linn. Soc. Bot. 9: 515. 1867; Hook. f., Fl. Brit. India 4: 533. 1885; Gamble, Fl. Pres. Madras 1079(755). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 342. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 618. 2009. *Gendarussa wynaadensis* Nees in Wall., Pl. Asiat. Rar. 3: 105. 1832. *Adhatoda wynaadensis* (Nees) Nees in DC., Prodr. 11: 406. 1847.

Subshrubs, stem terete, smooth. Leaves simple, opposite, 14-18 x 4-6 cm, lanceolate, acuminate at both ends, glabrous, lateral nerves 7 pairs; petiole 1-3.5 cm long. Spike 10 cm long, axillary and terminal, slender; rachis pubescent, sometimes branched. Flowers in distant pairs; bracts 3 x 1 mm, hairy. Calyx lobes 4 mm long, linear-lanceolate, glandular hairy. Corolla 12 mm long, throat hairy, rose coloured; upper lip 5 mm long, oblong, obtuse, slightly notched; lower 3-lobed. Ovary glabrous in the upper half. Capsule 15 mm long, pubescent; seeds 4, obovoid, oblique, minutely rugulose, dark brown.

Paripode, KJD 25500

Fl. & Fr.: November-March

Distribution: Fairly common in Semi-evergreen forests of Paripode. Endemic to Western Ghats.

LEPIDAGATHIS Willd., Sp. Pl. 3(1): 400. 1800.

1a. Root stock woody; calyx villous *L. keralensis*

1b. Root stock not woody; calyx apex glandular hairy *L. incurva*

Lepidagathis incurva Buch.-Ham. ex D.Don, Prodr. Fl. Nepal. 119. 1825; Manilal & Sivar., Fl. Calicut 223. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 343. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 619. 2009. *Lepidagathis hyalina* Nees in Wall., Pl. Asiat. Rar. 3: 95. 1832; Hook. f., Fl. Brit. India 4: 521. 1884; Gamble, Fl. Pres. Madras 1068(748). 1924.

Prostrate herbs, stem angular, strigose. Leaves simple, 6-8 x 3 cm, ovate, apex acute, base cuneate, hispid, nerves to 7 pairs. Spikes terminal and axillary, clustered; bracts and bracteoles similar, 3.5 x 2 mm, lanceolate, ciliate, hyaline. Flowers densely packed. Sepals 5, 5 mm long, linear-lanceolate, ciliate, glandular-hairy at apex. Corolla 6 mm long, bilabiate, tube short, slender, upper lip entire, lower lip 3-lobed, hairy outside. Stamens 4, didynamous, anthers softly hairy. Ovary ovoid, thinly hairy, style curved, stigma capitate. Capsule 4 mm long, ellipsoid, hairy at apex; seeds 4, compressed, rugose, brown.

Paripode, KVB 31699

Fl. & Fr.: February-April

Distribution: Fairly common in Semi-evergreen forests of Paripode and Plantations of Kariyenkappu.

Lepidagathis keralensis Madhu. & Singh, Kew Bull. 47: 301. 1992.

Perennial, prostrate, much branched herbs with woody rootstock; stem glabrous, quadrangular, more or less winged. Leaves simple, opposite, 10 mm x 3 mm, narrowly oblong-lanceolate, acute or blunt-acuminate at apex, dark green with purple margins, rigid, plicate, glabrous, conspicuously nerved. Spikes 1-3, terminal, procumbent, 2 cm long. Flowers sessile, ca 1 cm long; sterile bracts many (5-8), more or less uniform, up to 10 x 4 mm, oblong-lanceolate, densely pubescent, each with a stiff, sharply pointed mucronate spine, persistent. Calyx villous, deeply 5-lobed, lobes unequal, persistent, similar to bracts. Corolla 10 mm long, densely hairy in bud, tube cylindrical below, suddenly expanded, 2-lipped, upper lip 2-lobed, erect or reflexed, pink, lower lip 3-lobed, pink with white to yellow palate. Stamens 4, didynamous, up to 6 mm long, sparsely hairy, 2-celled, purple to deep violet in colour. Disc annular. Ovary compressed ovoid, 2 mm long, 2-celled with one ovule in each; style slender, 7-8 mm long, hairy at lower ventral region with glands; stigma capitate, slightly bifid. Fruit a compressed capsule, 6 mm long, glabrous; seeds 2, flat, softly hairy with white aril.

Near Uruppukunnu, KVB 31479

Fl. & Fr.: December-April

Distribution: Lateritic areas near Semi-evergreen forests at Uruppukunnu. Endemic to South India (Kerala).

PHAULOPSIS Willd., Sp. Pl. 3(1): 4, 342. 1800.

Phaulopsis imbricata (Forssk.) Sweet., Hort. Brit. (ed. 1) 327. 1827; Manilal & Sivar., Fl. Calicut 222. 1982; Ansari, Fl. Kasaragod Div. 287. 1985; Ramach. &

V.J. Nair, Fl. Cannanore Dist. 347. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 704. 2009. *Ruellia imbricata* Forssk., Fl. Aeg.-Arab. 113. 1775. *Ruellia dorsiflora* Retz., Obs. Bot. 6:31.1791. *Micranthus oppositifolius* Wendl., Bot. Beobacht 39. 1798; Gamble, Fl. Pres. Madras 1022(718). 1924. *Phaulopsis dorsiflora* (Retz.) Sant., Kew Bull. 1948: 276. 1948; Vajr., Fl. Palghat Dist. 358. 1990.

Diffuse herbs, branches glandular hairy. Leaves in unequal pairs, 3-5 x 2 cm, elliptic, acuminate at both ends, nerves 4 pairs; petiole 2.5 cm long. Spikes axillary, 2 x 1 cm, 1-sided; bracts paired, 6 x 7 mm, orbicular, hairy and long ciliate along the margins; bracteoles absent. Flowers small, scarcely seen above the bracts. Calyx lobes 5, unequal. Corolla 8 mm long, bilabiate, tube slender, lobes obtuse, white with pink spots. Stamens 4, filaments united into an adnated sheath below. Capsule 3 mm long, glabrous; seeds 4, compressed.

Paripode, *KJD 26275*

Fl. & Fr.: November-March

Distribution: Common in Plantations.

PSEUDERANTHEMUM Radlk., Sitzungsber. Math. Phys. Konigl. Bayer. Akad. Wiss. Munchen 13:282. 1883.

Pseuderanthemum malabaricum (Clarke) Gamble, Fl. Pres. Madras 1064(745). 1924; Manilal & Sivar., Fl. Calicut 217. 1982; Ansari, Fl. Kasaragod Div. 288. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 348. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 622. 2009. *Eranthemum malabaricum* Clarke in Hook. f., Fl. Brit. India 4: 497. 1884.

Subshrubs, stem terete, white, smooth. Leaves simple, opposite, 7-10 x 4 cm, elliptic, acuminate at both ends, glabrous, glaucous below, nerves 5 pairs; petiole to 2 cm long. Spike 3-8 cm long, terminal, slender; bracts and bracteoles similar, 3 mm long, linear. Flowers in interrupted clusters of 1-3, on long slender interrupted to 23 cm long spikes. Calyx 6 mm long, lobes united at base, acuminate. Corolla white with pink or purple dots on the larger lobe; tube 30 mm long, slender; lobes 10 mm long, obovate, subequal. Stamens 2, free, anthers oblong; stigma bilobed. Capsule 18 x 5 mm, clavate, basal portion solid; seeds 5 x 3 mm, compressed, reticulate.

Paripode, *KJD 26292*

Fl. & Fr.: December-March

Distribution: Rare in Semi-evergreen forests of Paripode.

RHINACANTHUS Nees, in Wall., Pl. Asiat. Rar. 3: 76, 108. 1832.

Rhinacanthus nasutus (L.) Kurz, J. Asiat. Soc. Bengal 39: 79. 1870; Manilal & Sivar., Fl. Calicut 215. 1982; Ansari, Fl. Kasaragod Div. 288. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 348. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 622. 2009. *Justicia nasuta* L., Sp. Pl. 16. 1753. *Rhinacanthus communis* Nees in Wall., Pl. Asiat. Rar. 3: 109. 1832; Hook. f., Fl. Brit. India 4: 541. 1885; Gamble, Fl. Pres. Madras 1083(758). 1924.

Erect shrubs, stem terete, tomentose. Leaves simple, opposite, 8-12 x 4-8 cm, elliptic, acute at both ends, crenulate, minutely pubescent; nerves 7-10 pairs. Flowers in terminal, paniced cymes; bracts and bracteoles similar, 2 mm long, hispid. Calyx lobes 5, 5 mm long, linear-lanceolate, hispid. Corolla white, tube 25 mm long, slender, hispid; upper lip entire, oblong, acuminate; lower lip broad, 3-lobed, obtuse. Stamens 2, inserted near the throat of the

tube, equal; one anther lobe lower than other, glabrous. Ovary cell 2-ovuled, style slender. Capsule 2 cm long, clavate, with a lower solid slender stalk, glabrous; seeds 1 or 2 in each cell, rugose.

Paripode, *KJD 26298*

Fl. & Fr.: November-February

Distribution: Common in plantations.

RUNGIA Nees, in Wall., Pl. Asiat. Rar. 3: 77, 109. 1832.

Rungia pectinata (L.) Nees in DC., Prodr. 11: 469. 1847; Manilal & Sivar., Fl. Calicut 216. 1982; Ansari, Fl. Kasaragod Div. 289. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 350. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 624. 2009. *Justicia pectinata* L., Amoen. Acad. 4: 299. 1759. *Rungia parviflora* (Retz.) Nees var. *pectinata* (L.) Clarke in Hook. f., Fl. Brit. India 4: 550. 1885; Gamble, Fl. Pres. Madras 1071(750). 1924.

Herbs, stem hairy. Leaves simple, 4-6 x 2 cm, ovate to linear-oblong or obovate. Spikes 2 x 0.7 cm, 2-5 together, axillary, sessile; sterile bracts 4 x 2 mm, elliptic, narrowly winged on one side; fertile bracts 3 x 2 mm, obovate, broadly winged on either side, emarginate, pubescent; bracteoles similar to bracts. Flowers small, densely packed. Sepals linear, acuminate, hyaline, hairy. Corolla 4 mm long, upper lip entire, white. Stamens 2, filaments glabrous; cells of the lower anther with a white appendage. Capsule 2.5 mm long, glabrous; seeds orbicular, rugose, brown.

Paripode, *KVB 31773*

Fl. & Fr.: November-February

Distribution: Fairly common in Plantations.

STROBILANTHES Blume, Bijdr. 781, 796. 1826.

- 1a. Fertile stamens 2, free *S. cuspidatus*
- 1b. Fertile stamens 4, united into sheath, adnate to the corolla 2
- 2a. Staminal sheath hairy or ciliate 3
- 2b. Staminal sheath glabrous..... *S. tristis*
- 3a. Bracts and bracteoles glabrous in flowers 4
- 3b. Bracts and bracteoles glandular hairy in flowers 8
- 4a. Bracts decurrent along with axis *S. decurrens*
- 4b. Bracts not decurrent 5
- 5a. Inflorescence panicle..... *S. amabilis*
- 5b. Inflorescence spike 6
- 6a. Spikes solitary *S. ciliates*
- 6b. Spikes 2-5 together 7
- 7a. Seeds winged; bracteoles glabrous in fruit *S. heyneanus*
- 7b. Seeds not winged; bracteoles hairy in fruit..... *S. barbatus*
- 8a. Spikes numerous, paniced *S. rubicundus*
- 8b. Spikes not paniced 9
- 9a. Bracteoles linear *S. aurita*
- 9b. Bracteoles broad 10
- 10a. Leaf sessile or subsessile *S. sessilis*
- 10b. Leaf petiolate 11
- 11a. Spike solitary *S. ixiocephalus*
- 11b. Spikes 2 or 3 together *S. lupulinus*

Strobilanthes aurita Wood, Kew Bull. 50: 12. 1994; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 64. 2006; Ratheesh Narayanan,

Fl. Stud. Wayanad Dist. 628. 2009. *Strobilanthes caudatus* sensu Beed., Ic. t. 213. 1868-1874, non Anders. 1860; Hook. f., Fl. Brit. India 4: 441. 1884; Gamble, Fl. Pres. Madras 1040(729). 1924. *Mackenzia caudata* (Anders.) Ramamoorthy in Saldanha & Nicolson, Fl. Hassan Dist. 553. 1976; Ramach. & V.J. Nair, Fl. Cannanore Dist. 343. 1988; Vajr., Fl. Palghat Dist. 355. 1990.

Subshrubs; branches terete, glabrous. Leaves simple, opposite, 8-12 x 2-3 cm, elliptic, caudate acuminate, glabrous, margins entire; lateral nerves 8 pairs. Spikes 1.5 x 2 cm, axillary, solitary or 2-3 together, peduncled; peduncle to 3 cm long; involucre bracts smaller than floral bracts, linear; floral bracts 20 x 2 mm, linear, obtuse, glandular-hairy; bracteoles 3, linear; flowers few. Calyx 7 mm long, lobes linear-oblong, hairy. Corolla 22 mm long, blue, tube narrow at base, with two patches of hairs at throat. Staminal sheath hairy.

Paripode, KVB 31673

Fl. & Fr.: September-December

Distribution: Common in Evergreen forests of Moonamthode, Kattikari, Chavachi, Chelachode and Meenmutty also in Semi-evergreen forests of Paripode. Endemic to Western Ghats; Conservation status: Vulnerable.

Strobilanthes barbatus Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; Hook. f., Fl. Brit. India 4: 437. 1884; Gamble, Fl. Pres. Madras 1037(727). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, *Strobilanthes* 66. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 629. 2009. *Nilgirianthus barbatus* (Nees) Bremek., Mat. Monogr. Strob. 172. 1944; Anil Kumar et al., Fl. Pathanamthitta 384. 2005. *Strobilanthes barbatus* Nees var. *bonaccordensis* Santhosh & Raj Vikraman, Journ. Econ. Tax. Bot. 25: 742. 2001.

Gregarious shrubs, 3-4 m high, sometimes scandent; stems quadrangular, often winged, sulcate, glabrous. Leaves simple, opposite in unequal pairs, ca 15 x 8 cm, elliptic-lanceolate, acute at apex, decurrent at base, entire, crenulate or repand at margin, coriaceous, glabrous, rarely puberulous, lineolate above; lateral nerves 7-12 pairs, raised beneath; petioles winged, ca 5 cm long, often swollen at leaf base, auriculate at base (when winged). Inflorescences spikes, ca 5 cm long, sometimes sessile 2-4-fascicled heads interrupted at base, dense-flowered; bract imbricate, orbicular, caudate at apex, ca 1.8 cm long, green, glabrous when young, ciliate and glandular-hairy in fruit, grooved in adaxial face, recurved; bracteoles ovate-lanceolate, ca 1.5 cm long, pubescent, ciliate. Calyx ca 1.2 cm long; lobes subequal, linear-lanceolate, minutely ciliate or not. Corolla tubular-campanulate, ca 2.5 cm long, glabrous outside, hairy inside, white; tubular base slightly shorter than upper campanulate portion; limb nearly erect; lobes 5, ovate-acute, ca 6 mm long, ciliate. Stamens 4, included or slightly exerted, didynamous, united; staminal sheath extending beyond the cylinder base; shorter pair ca 3 mm long, hairy only at base; longer pair ca 5 mm long, hairy throughout; filaments arising from different levels on staminal sheath; staminode absent. Ovary glandular-hairy above; ovules 2 in each locule with lower pair smaller and suppressed in seed; style slender, ca 2 cm long. Capsules elliptic, ca 1.2 cm long, 2-seeded; seeds obovate-orbicular, subacute at apex, ca 6 mm across, thin, glabrous, exareolate.

Meenmutty, KVB 31284

Fl. & Fr.: September-December

Distribution: Common in Evergreen forests of Meenmutty, Monamthode, Kattikari and Chavachi. Endemic to Western Ghats.

Strobilanthes ciliatus Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; Hook. f., Fl. Brit. India 4: 439. 1884; Gamble, Fl. Pres. Madras 1039(728). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 82. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 629. 2009. *Nilgirianthus ciliatus* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect 2, 41: 172. 1944; Ansari, Fl. Kasaragod Div. 285. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 345. 1988; Anil Kumar et al., Fl. Pathanamthitta 385. 2005. *Strobilanthes warreensis* Dalz., Hook.'s J. Bot. Kew. Gard. Misc. 2: 341. 1850; Hook. f., Fl. Brit. India 4: 439. 1884; Gamble, Fl. Pres. Madras 1039(728). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 193. 2006. *Nilgirianthus warreensis* (Dalz.) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 173. 1944; Ansari, Fl. Kasaragod Div. 286. 1985.

Shrubs, branches terete, glabrous. Leaves simple, opposite, 10-15 x 3-5 cm, acuminate at both ends, glabrous, nerves 5 pairs, raised above, scabrid; petiole 2 cm long. Spikes 1.5 cm long, axillary, solitary, peduncled; bracts 6 x 4 mm, obovate; bracteoles 5 x 1 mm, linear-oblong; flowers 5-15. Calyx 5 mm long, lobes oblong, connate below the middle. Corolla 15 mm long, white with violet or blue patches on lower lobes. Staminal sheath hairy.

Paripode, *KJD 25471*

Fl. & Fr.: December-May

Distribution: Common in Semi-evergreen forests of Paripode. Endemic to southern Western Ghats.

Strobilanthes cuspidatus (Benth.) Anders., J. Linn. Soc. Bot. 9: 465. 1867; Hook. f., Fl. Brit. India 4: 435. 1884; Gamble, Fl. Pres. Madras 1036(726). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 89. 2006. *Endopogon cuspidatus* Benth., Linnaea 24: 646. 1851. *Endopogon versicolor* Wight, Ic. t. 1497. 1849. *Phlebophyllum versicolor* (Wight) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41:170.1944.

Large shrubs; stems terete; branchlets adpressed-white woolly. Leaves to 15 x 6 cm, ovate, acuminate, entire, base acute, glabrous; lateral nerves 7-10 pairs. Spikes 3-5 cm long, interrupted, on trichotomously branched peduncle; bracts 2-4, 2 x 0.5 cm, lanceolate, glandular-hairy. Flowers few; calyx 7 mm long, lobes subulate, glandular-hairy. corolla 25 mm long, blue. Stamens 2, staminal filaments sparsely hairy; anthers 2mm. Ovary on a disc, ca.3 mm long; style hairy at base. Capsule 16 mm long, stalked, glabrous; seeds 4, orbicular, hairy.

Kannadivechakunnu, *KJD 26323*

Fl. & Fr.: October- December

Distribution: Common in Evergreen forests of Kannadivechakunnu, Meenmutty and Pothanplavu. Endemic to southern Western Ghats.

Strobilanthes decurrens Nees in DC., Prodr. 11:189.1847; Hook. f., Fl. Brit. India 4:440.1884; Gamble, Fl. Pres. Madras 1040(729). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 93. 2006. *Goldfussia decurrens* (Nees) Wight, Ic. t. 1522. 1851. *Nilgirianthus decurrens* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 173. 1944; Mohanan & Sivad., Fl. Agasthyamala 512. 2002.

Subshrubs, branches obtusely quadrangular, glabrous. Leaves simple, opposite, 15-17 x 5-7 cm, elliptic, shortly acuminate, decurrent at the base, glabrous; petiole 2-3 cm long. Spikes 4-8 x 2 cm, oblong, solitary, axillary; peduncle deflexed, with small basal bracts in the middle; bracts 2 x 1 cm, ovate, acute, decurrent along the axis; bracteoles minute; flowers few to many. Calyx 10 mm long; lobes acuminate, glabrous. Corolla 20 mm long, glabrous, white. Staminal filaments hairy. Capsule 14 x 8 mm, glabrous; seeds 8 x 5 mm, one in each chamber, flat, yellowish, glabrous.

Kattikari, *KJD 26081*

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Kattikari. Endemic to southern Western Ghats.

Strobilanthes heyneanus Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; Hook. f., Fl. Brit. India 4: 443. 1884; Gamble, Fl. Pres. Madras 1041(730). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 109. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 630. 2009. *Nilgirianthus heyneanus* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 173. 1944; Ansari, Fl. Kasaragod Div. 286. 1985; Anil Kumar et al., Fl. Pathanamthitta 385. 2005. *Nilgirianthus heyneanus* (Nees) Bremek. var. *neesii* Bremek., Mat. Monogr. Strob. 173. 1944; Ramach. & V.J. Nair, Fl. Cannanore Dist. 345. 1988. *Strobilanthes asperrimus* Nees in DC., Prodr. 11: 183. 1847; Hook. f., Fl. Brit. India 4: 443; 1884; Gamble, Fl. Pres. Madras 1041(730). 1924; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 628. 2009.

Shrubs, branches hirsute. Leaves simple, opposite, 6-10 x 4-7 cm, broadly elliptic, apex bluntly acuminate, base attenuate, crenate, covered with bulbous based hairs; lateral nerves 8-9 pairs; petiole 3-4.5 cm long. Spikes 3-4 together, 2 x 1.5 cm, axillary, on trichotomous peduncles, ovoid; involucre bracts 8 x 6 mm, broadly ovate, obtuse; floral bracts 13 x 10 mm, ovate, concave, obtuse, glabrous; bracteoles absent; flowers few to many. Calyx divided nearly to the base, lobes 6 x 2.5 mm, oblong, emarginated. Corolla pale blue, 25 mm long; tube stout, with a patch of hairs inside above the stamens. Staminal filaments and sheath hairy. Ovary glabrous; style bulged below the stigma, hairy. Capsule 9 x 4 mm, glabrous; seeds 4, ovoid flattened, 3 mm long.

Pothurumi, *KVB 31629*; Chelachode, *KVB 31297*

Fl. & Fr.: October-December

Distribution: Common in Evergreen forests of Moonamthode to Kattikari and Chelachode to Pothurumi.

Strobilanthes ixiocephalus Benth., Flora 33: 557. 1849; Hook.f., Fl. Brit. India 4: 444. 1884; Gamble, Fl. Pres. Madras 1041 (730). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 123. 2006. *Strobilanthes neesiana* Wight, Ic. t. 1523. 1850. *Thelepaepale ixiocephala* (Benth.) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 188. 1944.

Semierect shrubs, ca 1 m high; stems subtetragonal, sulcate, hairy, glabrous when old. Leaves simple, opposite, unequal, to 12 x 5 cm, elliptic-lanceolate, acuminate at apex, attenuate or cuneate at base, crenate at margin, chartaceous, hispid above and on secondary veins beneath, densely lineolate on both surfaces; lateral nerves 6-12 pairs, parallel, slender, prominent, joining along margin; petioles ca 4 cm long, hairy. Inflorescence

short spikes, ovoid, solitary, axillary or in axillary or terminally clustered, branched cymes, viscid; bracts ovate, acute or acuminate, ca 1.2 cm long, penninerved, glandular-hairy; bracteoles linear-obovate, ca 7 mm long, glandular-hairy. Calyx divided to the base, ca 1 cm long; lobes linear, equal, obtuse, glandular-hairy, enlarged in fruit. Corolla tubular-ventricose, ca 2 cm long, pubescent outside, hairy inside, pale blue or white; tubular portion short, ca 3 mm long; lobes obovate-oblong, apiculate at tip, ca 6 mm long. Stamens 4, monadelphous, included; staminal sheath truncate, hairy; longer filaments ca 5 mm long; short filaments ca 2 mm long. Ovary on a prominent disc, glabrous; style glabrous, ca 1.5 cm long; stigma slightly bulged above. Capsules obovoid, ca 1.2 cm long, narrowed at base, compressed, mucronate, included, glabrous; seeds 2, ovoid, flattened, 3.5 mm across, hygroscopically hairy and very densely along margin.

Mullenpara, NS & KJD 31928

Fl. & Fr.: November-January

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Strobilanthes lupulinus Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; Hook. f., Fl. Brit. India 4: 443. 1884; Gamble, Fl. Pres. Madras 1041(730). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 138. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 630. 2009. *Nilgirianthus lupulinus* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect. 2, 41: 173. 1944; Ansari, Fl. Kasaragod Div. 286.1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 345.1988.

Shrubs, branchlets glabrous. Leaves simple, opposite, 8-13 x 6 cm, elliptic, apex acuminate, base attenuate, glabrous. Spikes 2 x 1.5 cm, axillary, 2-3 together on trichotomous peduncle, ovoid or globose; bracts 14 x 11 mm, orbicular or obovate, concave, glabrous; flowers 4-10 in each spike. Calyx divided to the middle, lobes 6 x 2 mm, glabrous. Corolla 2-2.5 cm long, white, hairy inside, tube very narrow at the base. Staminal sheath ciliate. Ovary glabrous; style glabrous or not. Capsule 10 x 5 mm, glabrous; seeds 3 mm, biconvex, hairy along the margins.

Kattikari, KJD 26015

Fl. & Fr.: October-December

Distribution: Fairly common in Evergreen forests of Kannadivechakuunu and Kattikari. Endemic to Peninsular India.

Strobilanthes rubicundus (Nees) Anders, J. Linn. Soc. Bot. 9: 483. 1867; Hook. f., Fl. Brit. India 4: 475. 1885; Gamble, Fl. Pres. Madras 1044(732). 1924; Sasidh., Fl. Periyar Tiger Reserve 307. 1998; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 169. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 632. 2009. *Strobilanthes paniculatus* sensu Bedd., Ic. t. 199. 1868-1874, non Anders., 1867. *Leptacanthus rubicundus* Nees in Wall., Pl. Asiat. Rar. 3: 90. 1832; Manilal, Fl. Silent Valley 207. 1988; Vajr., Fl. Palghat Dist. 354. 1990; Mohanan & Sivad., Fl. Agasthyamala 510. 2002.

Shrubs; branchlets terete, glabrous. Leaves 8-10 x 2-4 cm, elliptic, caudate at apex, attenuate at base, glabrous. Panicles terminal, densely hairy; basal bracts paired, 5-7 mm long, lanceolate, deflexed. Flowers many, distant. Calyx 7 mm long, lobes linear, glandular-hairy. Corolla 2 cm long, glabrous, pale pink, lobes with purple streaks. Capsule 17 mm long, linear, glabrous; seeds 2.5 x 2 mm, brown.

Ambalappara, KJD 31887

Fl. & Fr.: October-March

Distribution: Fairly common in the Evergreen forests of Ambalappara to Pothurumi, Kattikari. Endemic to Western Ghats.

Strobilanthes sessilis Nees in Wall., Pl. Asiat. Rar. 3: 185. 1832, **var. sessilis**; Hook. f., Fl. Brit. India 4: 452. 1884; Gamble, Fl. Pres. Madras 1042(731). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 178. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 632. 2009. *Pleocaulus sessilis* (Nees) Bremek., Verh. Acad. Wet. afd. Natuurk. Sect 2, 41: 185. 1944; Mohanan, Fl. Quilon Dist. 308 307; Ramach. & V.J. Nair, Fl. Cannanore Dist. 348. 1988; Vajr., Fl. Palghat Dist. 358. 1990.

Sparingly branched subshrubs; stems terete, strigose. Leaves simple, opposite, 2-5 x 3 cm, ovate, acute, sessile, serrate, densely strigose, base cordate; nerves 6 pairs. Spikes 3-5 cm long, cylindrical, axillary and terminal; bracts 10 x 7 mm, acuminate, densely hairy; flowers many, densely arranged. Calyx 9 x 2 mm, divided nearly to the base, lobes subequal, lanceolate, hairy. Corolla 30 mm long, blue, hairy; lobes ovate. Stamens included, longer filaments hairy towards apex, shorter with few hairs at the base. Style hairy. Capsule 7-8 mm long, linear-oblong; seeds 2 mm across, suborbicular, brown.

Ambalappara, KVB 31752, 31784

Fl. & Fr.: November-December

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to Western Ghats.

Strobilanthes tristis (Wight) Anders., J. Linn. Soc. Bot. 9: 470. 1867; Hook. f., Fl. Brit. India 4: 441. 1885; Gamble, Fl. Pres. Madras 1040(729). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 182. 2006. *Goldfussia tristis* Wight, Ic. t. 1508. 1850.

Shrubs, branchlets glabrous. Leaves simple, opposite, 15-25 x 4-10 cm, acuminate at both ends, glabrous; petiole 4-8 cm long. Spikes 2.5-4 cm long, lanceolate, acuminate, 1-2-flowered, deflexed, in axillary clusters, glabrous; bracts 2.5 x 0.5 cm, lanceolate, acuminate, crenate, ciliate along the margins. Sepals 17 x 2.5 mm, lanceolate, acuminate, hairy. Corolla ca 3 cm long, tube narrowed to the base, glabrous, white. Staminal sheath glabrous. Capsule 11 x 3 mm; seeds orbicular.

Kattikari, 31885

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Kattikari. Endemic to Southern Western Ghats.

Strobilanthes amabilis Clarke in Hook. f., Fl. Brit. India 4: 476. 1884; Gamble, Fl. Pres. Madras 1044(732). 1924; Venu in Daniel & Sanjappa (eds.), Fl. India ser. 4, Strobilanthes 52. 2006. *Leptacanthus amabilis* (Clarke) Bremek., Mat. Monogr. Strob. 184. 1944.

Large shrubs to 2 m tall, stem jointed, viscous-glandular-hairy. Leaves opposite, to 18 x 8 cm, elliptic or oblanceolate, acute at base, entire undulate or crenate at margin, acute or acuminate at apex, subcoriaceous, glabrous, lineolate on either surface; lateral nerves ca 15 pairs, prominent, curved upwards; petioles 2.5 cm long. Inflorescences terminal, loose panicle, glandular sticky; bracts and bracteoles reddish-brown tomentose, nodal

bracts, linear-oblong, ca 4 mm long; pedicel slender, ca 2 cm long; floral bracts minute, linear, ca 3mm long. Calyx glandular-villous, divided to base; lobes linear-lanceolate, one longer than the rest; shorter ones ca 1 cm long; longer one ca 1.5 cm long. Corolla pink, campanulate-ventricose, ca 3 cm long, hairy inside; lobes rounded, entire or distantly wavy. Stamens 4, didynamous, arising from same height from staminal sheath; filaments and sheath hairy throughout. Ovary glabrous; style linear, ca 2.5 cm long, glabrous; stigma slender. Disk prominent. Capsule minutely stipulate, apiculate, excluded from calyx, ca 1.5 cm long, glabrous; seeds 4, ovate, inflated in center, ca 4 mm across.

Pothurumi, *KJD 26045*

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Ambalappara, Pothurumi, Mullenpara and Kattikari.

THUNBERGIA Retz., *Physiogr. Salsk. Handl.* 1(3): 163. 1780, *nom. cons.*

1a. Plants erect; racemes not drooping *T. erecta*

1b. Climbers; racemes drooping *T. mysorensis*

Thunbergia erecta (Benth.) Anders., *J. Linn. Soc. Bot.* 7:18.1864; Gamble, *Fl. Pres. Madras* 1008(708).1924; Manilal & Sivar., *Fl. Calicut* 226. 1982. *Meyenia erecta* Benth. in Hook. *Niger. Fl.* 476. 1846.

Erect shrubs, to 1.5 m high; branches woody, glabrous; bark white. Leaves simple, opposite, 3.5-6.5 x 1.5-4 cm, ovate or ovate-lanceolate, entire, glabrous, acuminate at apex, rounded or acute at base; petioles 0.5-1 cm long. Flowers in axillary, few-flowered racemes; bracts foliaceous. Calyx teeth 5-9, linear. Corolla purple or white, tube to 3.5 cm long, lobes obovate, obtuse. Capsules 1.5-2 cm long, globose below, suddenly narrowed into a barren, sword-shaped beak.

Kariyenkappu, *KJD 26211*

Fl. & Fr.: Throughout the year

Distribution: Earlier settlements.

Thunbergia mysorensis (Wight) Anders., *J. Linn. Soc. Bot.* 9: 448. 1967; Hook. f., *Fl. Brit. India* 4: 393. 1884; Gamble, *Fl. Pres. Madras* 1008(708). 1924; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 352. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 635. 2009. *Hexacentris mysorensis* Wight, *Ic. t.* 871. 1844.

Climbers. Leaves simple, 10-14 x 4-8 cm, ovate-lanceolate or oblong, apex acute to acuminate, base truncate or hastate, scabrid, coarsely nerved, dentate; petiole 1-5 cm long. Racemes axillary, to 50 cm long, drooping; flowers many; bracteoles 15-25 x 5-12 mm, ovate-oblong-lanceolate, pedicels 2-3 cm long, opposite. Calyx obscure. Corolla yellow, to 4 cm long, 6 cm across, tube ventricose, lobes obovate, glabrous. Filaments ciliate, anthers spurred. Capsule 3 cm long.

Pothurumi, *KVB 31614*

Fl. & Fr.: December-March

Distribution: Fairly common in Evergreen forests of Moonamthode, Chavachi and Pothurumi.

VERBENACEAE

- 1a. Fertile stamens 2, flowers sunken in the cavities of spike Stachytarpheta
- 1b. Fertile stamens 4-6, flowers not as above 2
- 2a. Flowers in condensed spikes 3
- 2b. Flowers in cymes 4
- 3a. Erect shrubs, stem prickly; calyx truncate or obscurely lobed Lantana
- 3b. Prostrate herbs, stem not prickly; calyx cupular, lobes 2 Phyla
- 4a. Leaves digitate Vitex
- 4b. Leaves simple 5
- 5a. Corolla regular; young parts stellate hairy 6
- 5b. Corolla irregular; young parts not stellate hairy 7
- 6a. Flowers 4-merous; fruit glabrous Callicarpa
- 6b. Flowers 6-merous; fruit densely hairy Tectona
- 7a. Flowers more than 2.5 cm broad Gmelina
- 7b. Flowers less than 2 cm broad 8
- 8a. Drupes with 1 pyrene Premna
- 8b. Drupes with 2-4 pyrenes 9
- 9a. Stamens inserted well below in the tube; pyrenes 4 10
- 9b. Stamens inserted at middle in the tube; pyrenes 2 Citharexylum
- 10a. Leaves whorled, acute at base; corolla blue Rothea
- 10b. Leaves opposite, cordate or rounded at base; corolla not blue Clerodendrum

CALLICARPA L., Sp. Pl. 111. 1753.

Callicarpa tomentosa (L.) L. in Murr., Syst. Veg. (ed. 13) 130. 1774; Manilal & Sivar., Fl. Calicut 227. 1982; Ansari, Fl. Kasaragod Div. 291. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 353. 1988; Rajendran & Daniel, Indian Verbenaceae 53. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 636. 2009. *Tomex tomentosa* L., Sp. Pl. 118. 1753. *Callicarpa lanata* L., Mant. Pl. 2: 331. 1771, nom. illeg.; Gamble, Fl. Pres. Madras 1092(764). 1924. *Callicarpa arborea* Miq. ex Clarke in Hook. f., Fl. Brit. India 4: 507. 1885, non Roxb. 1832.

Trees, to 10 m high, bark 5-8 mm thick, brown, rough; branchlets fulvous tomentose. Leaves simple, opposite, 13-30 x 8-20 cm, ovate or elliptic, apex acuminate, base truncate, acute or rounded, margin entire or dentate, glabrous above except midrib, densely white stellate tomentose beneath, glaucous, chartaceous; petiole 2.5-6 cm long, stout, tomentose; lateral nerves 6-8 pairs, pinnate, arched, prominent, raised beneath; intercostae scalariform, prominent. Flowers bisexual, pinkish-purple, in axillary corymbose cymes, densely tomentose. Calyx 2 mm long, campanulate, lobes 5. Corolla 4 mm long, 5 mm across, tube short, lobes 4, spreading. Stamens 4, exerted; filaments 6.5 mm, glandular; anthers sagitate. Ovary globose, pubescent, 2 locular, ovules 2 in each cell; style slender; stigma capitate. Fruit a drupe, globose, 3 mm across, glabrous, black; seeds 3-4, oblong, angular.

Kattikari, *KJD* 18753

Fl. & Fr.: November-April

Distribution: Fairly common in Evergreen forests of Kattikari and Semi-evergreen forests of Pothanplavu and Paripode.

CITHAREXYLUM L., Sp. Pl. 625. 1753.

Citharexylum spinosum L., Sp. Pl.: 625. 1753; Manilal & Sivar., Fl. Calicut 229. 1982; Sivar. & Manilal, Journ. Econ. Tax. Bot. 3: 813. 1982; Ansari, Fl. Kasaragod Div. 292. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 646.

2009. *Citharexylum fruticosum* L., Syst. Nat. ed. 10, 2: 1115. 1759, nom. superfl. *Citharexylum cinereum* L., Sp. Pl. ed. 2: 872. 1763, nom. illeg. *Citharexylum subserratum* Sw., Nov. Gen. Pl. 91. 1788; Anil Kumar et al., Fl. Pathanamthitta 390. 2005. *Citharexylum fruticosum* L. var. *subserratum* (Sw.) Moldenke, Phytologia 1: 17. 1933; Ramach. & V.J. Nair, Fl. Cannanore Dist. 360. 1988; Rajendran & Daniel, Indian Verbenaceae 77. 2002. *Citharexylum fruticosum* f. *subserratum* (Sw.) Moldenke, Phytologia 36: 164. 1977.

Shrubs or trees; branchlets 4-angular, sometimes spiny. Leaves decussate-opposite, alternate or subopposite, ternate or verticillate, exstipulate, to 15 x 6 cm, elliptic to oblong-elliptic, acute, entire or dentate, usually with a pair of glands at base of lamina; petiole 0.5 to 1.5 cm long. Inflorescence axillary and terminal, racemiform or spicate, simple or branched, erect or drooping; flowers numerous, small, regular or somewhat zygomorphic; bractlets inconspicuous. Calyx cupular or tubular, 5-lobed or 5-toothed to truncate. Corolla white, 0.8-1 cm across, infundibular or hypocrateriform, usually 5-lobed, rarely 4- or 6-lobed, lobes slightly irregular; tube narrow, cylindrical. Stamens 4, didynamous, rarely 5 or even 6; filaments attached at or above middle of corolla tube, included; the lower 2 forming staminodes. Ovary perfectly or imperfectly 4-loculed; ovule 1 in each locule; style terminal; stigma shortly 2-lobed. Fruit a drupe, partly enclosed by the enlarged calyx; pyrenes 2-loculed and 2-seeded.

Paripode, KJD 18776

Fl. & Fr.: April-September

Distribution: Planted in earlier settlements.

CLERODENDRUM Burm. ex L., Sp. Pl. 637. 1753.

1a. Flowers red; leaves shallowly 3-5-lobed, glabrous *C. paniculatum*

1b. Flowers white; leaves entire or shortly serrate, densely glandular-pubescent *C. infortunatum*

Clerodendrum infortunatum L., Sp. Pl. 637. 1753, non L. 1771; Hook. f., Fl. Brit. India 4: 594. 1885; Gamble, Fl. Pres. Madras 1100(770). 1924; Rajendran & Daniel, Indian Verbenaceae 116. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 637. 2009. *Clerodendrum viscosum* auct. non Vent. 1804; Manilal & Sivar., Fl. Calicut 232. 1982; Ansari, Fl. Kasaragod Div. 294. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 354. 1988.

Shrubs; young shoots tawny villous. Leaves simple, opposite, 8-17 x 6-12 cm, ovate or orbicular, apex acuminate, base cordate, margin entire or denticulate, villous beneath and tomentose above; basally 5-7 nerved; petiole to 8 cm long. Panicle terminal, 14-20 cm long, villous; bracts foliaceous. Calyx cupular, 0.8-1 cm long; lobes lanceolate, 3-5-ribbed, acuminate at apex, tomentose. Corolla white, tubular; tube 1-1.5 cm long, villous without; lobes 6-10 mm long, oblong, hairy without. Stamens 4; filaments slender, purplish, 2-2.5 cm long; anthers oblong. Ovary globose; style slender; exerted, 2-2.5 cm long. Drupe 6-8 mm across, globose, bluish-black on ripening; fruiting calyx enlarged, pink; seeds 2-4, globose, 2-3 mm across.

Moonamthode, KVB 31718

Fl. & Fr.: December-February

Distribution: Fairly common in Evergreen forests of Kattikari and Moonamthode; Semi-evergreen forests of Paripode and Pothanplavu.

Clerodendrum paniculatum L., Mant. Pl. 1: 90. 1767, "paniculata"; Hook. f., Fl. Brit. India 4: 593. 1885; Vivek., Bull. Bot. Surv. India 10: 240. 1969; Manilal & Sivar., Fl. Calicut 233. 1982; Ansari, Fl. Kasaragod Div. 293. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 354. 1988; Rajendran & Daniel, Indian Verbenaceae 128. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 638. 2009.

Erect subshrubs, to 2.5 m tall, stoloniferous; stem scarcely branched. Leaves simple, opposite, 7-18 x 8-19 cm, orbicular, margin faintly lobed, denticulate, apex acute, base cordate, membranous; basally 7-nerved; petiole to 10 cm long. Flowers in terminal panicles of dichotomous cymes; pedicels reddish, 6-14 mm long. Calyx deeply 5-lobed, red, campanulate, 3-5 mm long; lobes oblong, obtuse. Corolla red, hypocrateriform; tube slender, 1.4-2 cm long; lobes 7-8 mm long, posterior pair shorter and narrower than the others. Stamens exserted; filaments 2-3 cm long. Ovary oblong.

Chatharurmala, NS & KVB 31440

Fl. & Fr.: July-May

Distribution: Fairly common along the forest boundaries at Chatharurmala.

GMELINA L., Sp. Pl. 626. 1753.

Gmelina arborea Roxb., Pl. Corom. t. 246. 1815; Hook. f., Fl. Brit. India 4: 581. 1885; Gamble, Fl. Pres. Madras 1097(768). 1924; Ansari, Fl. Kasaragod Div. 295. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 355. 1988; Rajendran & Daniel, Indian Verbenaceae 155. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 639. 2009.

Deciduous trees, to 20 m high, bark 8-10 mm thick, white or whitish-grey, smooth, lenticellate, scurfy, exfoliating in thin flakes; branchlets stout, tomentose. Leaves simple, opposite, 7.5-25 x 6-20 cm, broadly ovate or ovate, base cordate truncate or rounded, apex acute or acuminate, margin entire, glabrous above and tomentose beneath, glaucous beneath, coriaceous; petiole 5-12.5 cm long, slender, tomentose; nerves 3-5 from base, lateral nerves 3-6, pinnate, prominent, prominent, puberulent beneath; intercostae scalariform, prominent; 2 glands on either side of the midrib at the base. Flowers bisexual, 3-3.7 cm long, yellow with orange-pink shade, in terminal panicles. Calyx 6 mm long, campanulate, 5 toothed, tomentose. Corolla bilabiate, tube ventricose, lobes 5, subequal, obovate, obtuse, densely hairy. Stamens 4, didynamous; anthers 2 mm, divaricate. Ovary 4 mm, superior, syncarpous, glabrous, ovules 4; style 2 cm, slender, glabrous, unequally bifid. Fruit a drupe 2.5-3.5 x 1-1.5 cm, ovoid, pulpy, pyrene bonny, ovoid with a deep depression, yellow; seeds 2-4, elliptic.

Valayamchal, KJD 31484

Fl. & Fr.: January-June

Distribution: Planted in the Sanctuary.

LANTANA L., Sp. Pl. 626. 1753.

Lantana camara L., Sp. Pl. 627.1757, **var. camara**; Rajendran & Daniel, Indian Verbenaceae 181. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 640. 2009. *Lantana aculeata* L., Sp. Pl. 627. 1753; Gamble, Fl. Pres. Madras 1087(761). 1924. *Lantana camara* L. var. *aculeata* (L.) Moldenke, Torreya 34: 9. 1934; Hook. f., Fl. Brit. India 4: 562. 1885; Manilal & Sivar., Fl. Calicut 230. 1982; Ansari, Fl. Kasaragod Div. 295. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 355. 1988.

Much branched scandent shrubs; stem 4-angled, armed with short thorns. Leaves simple, opposite, 3-6 x 2-4 cm, ovate or elliptic-ovate, apex acute to shortly acuminate, base subcordate or truncate, margin crenate-serrate, scabrous above, puberulous below, veins impressed above; petiole to 1.5 cm long. Inflorescence terminal and axillary condensed spikes; peduncle 3-4 cm long, shortly prickly. Flowers sessile, orange-red, changing to deep red on ageing; bracts closely imbricating. Calyx truncate. Corolla salver-shaped; tube 0.8-1 cm long, slender, cylindrical, bent and inflated over stamens; lobes 5, obscurely 2-lipped. Stamens 4, included. Ovary 2-celled; ovules 1 in each cell; style slender; stigma subcapitate. Drupe 2-3 mm across, globose, purple on ripening; seeds reticulate.

Paripode, *KJD 25582*

Fl. & Fr.: April-June

Distribution: Weed in the disturbed forest areas.

PHYLA Lour., Fl. Cochinch. 63, 66. 1790.

Phyla nodiflora (L.) Greene, Pittonia 4: 46. 1899; Manilal & Sivar., Fl. Calicut 231. 1982; Ansari, Fl. Kasaragod Div. 296. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 356. 1988; Rajendran & Daniel, Indian Verbenaceae 206. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 641. 2009. *Verbena nodiflora* L., Sp. Pl. 20.1753. *Lippia nodiflora* (L.) A.Rich. in Michx., Fl. Bor. Amer. 2: 15. 1803; Hook. f., Fl. Brit. India 4: 563. 1885; Gamble, Fl. Pres. Madras 1088(762). 1924.

Prostrate herbs, rooting at nodes. Leaves simple, 1-3 x 0.8-1.5 cm, obovate-spathulate or oblanceolate, sometimes elliptic or cuneiform, apex rounded or obtuse, base cuneate, margin sharply serrate above the middle, fleshy, glabrescent to appressed pubescent; petiole to 8 mm long, decurrent. Flowers 5-merous, sessile, aggregated in axillary, globose-capitate or elongate, cylindrical, stalked spikes, 1-2.5 cm long when mature and 6-9 mm across; peduncle solitary in each axil, 1.5-6 cm long; bracts small, closely imbricate, obovate. Calyx cupular, about equaling the corolla tube, deeply 2-cleft; lobes lanceolate. Corolla pink to white, 2-2.5 mm long, salver-form, 2-lipped, upper lip 2-lobed, emarginate, lower 3-lobed. Stamens 4, included. Drupe ca 2 mm long, enclosing two, 1-celled pyrenes.

Paripode, *KJD 26277*

Fl. & Fr.: November-December

Distribution: In moist localities.

PREMNA L., Mant. 154, 252. 1771, *nom. cons.*

1a. Staminal filaments glabrous; leaves oblong *P. glaberrima*

1b. Staminal filaments hairy; leaves broadly ovate *P. coriacea*

Premna coriacea Clarke in Hook. f., Fl. Brit. India 4: 573. 1885; Gamble, Fl. Pres. Madras 1095(766). 1923; Ramach. & V.J. Nair, Fl. Cannanore Dist. 356. 1988; Rajendran & Daniel, Indian Verbenaceae 226. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 642. 2009.

Large climbing shrubs; branchlets pilose, lenticellate. Leaves simple, opposite, 18 x 10 cm, ovate-oblong, abruptly acuminate at apex, cordate at base, entire, glabrous; nerves 4-5 pairs, very prominent beneath. Cymes to 15 cm across, corymbose, terminal; branches pilose; peduncles to 12 cm long, erect; bracts 3 mm long, ovate. Flowers many, creamy white; pedicels 1 mm long hispid. Calyx 1 mm long, truncate, pinkish brown, puberulus. Corolla 3.5 mm long, hairy.

Kariyenkappu, NS & KVB 31371

Fl. & Fr.: January-May

Distribution: Rare in plantations of Kariyenkappu and Evergreen forests of Meenmutty.

Premna glaberrima Wight, Ic. t. 1484. 1849; Hook. f., Fl. Brit. India 4: 577. 1885; Gamble, Fl. Pres. Madras 1096(767). 1923; Pandura. & V.J. Nair, Journ. Econ. Tax. Bot. 17: 180. 1993; 511; Rajendran & Daniel, Indian Verbenaceae 240. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 642. 2009.

Shrubs; branchlets scandent, puberulous. Leaves simple, opposite, 15 x 6 cm, elliptic-oblong, abruptly acuminate, rounded at base, entire or distantly serrulate, glabrous; nerves 6-7 pairs; petiole 1.5 cm long. Cymes 5 x 5 cm, terminal, corymbose; pedicels 2 mm long, hairy. Calyx 2 mm long, shortly bilipped, hispid. Corolla greenish white or cream, 5 mm long, throat hairy. Drupes 3 x 3 mm, hispid; seed 1, rugose, brown.

Kariyenkappu, KJD 26113

Fl. & Fr.: March-June

Distribution: Rare in plantations of Kariyenkappu and Evergreen forests of Pothanplavu. Endemic to southern Western Ghats.

ROTHECA Raf., Fl. Tellur. 4: 69. 1838.

Rotheca serrata (L.) Steane & Mabb., Novon 8: 206. 1998. *Volkameria serrata* L., Mant. Pl. 1: 90. 1767. *Clerodendrum serratum* (L.) Moon, Cat. Pl. Ceylon 46. n.382. 1824; Hook. f., Fl. Brit. India 4:592.1885; Gamble, Fl. Pres. Madras 1100(770). 1924; Manilal & Sivar., Fl. Calicut 233. 1982; Ansari, Fl. Kasaragod Div. 293. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 354. 1988; Rajendran & Daniel, Indian Verbenaceae 139. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 638. 2009. *Cyclonema serratum* (L.) Hochst., Flora 25: 227. 1842.

Shrubs to 2 m tall; stems and branches purplish, obtusely tetragonous. Leaves simple, opposite, or ternate. 8-22 x 5-14 cm, broadly elliptic-ovate or obovate, apex acuminate, base attenuate to acute, margin coarsely serrate, glabrous above and pubescent along the nerves below, thin-coriaceous; petiole to 1 cm long. Inflorescence elongate, terminal cymose panicles, 16-28 cm long, pubescent. Bracts ternate, 0.8-1.5 x 0.3-1 cm, ovate-lanceolate. Calyx 5-6 mm long, c. 5 mm across, cup-shaped, teeth ciliate. Corolla bluish; tube 0.8-1.2 cm long; lobes spreading, 2-lipped, 0.8-1 x 0.5-0.7 cm, unequal, oblong. Stamens 4; filaments 2-2.5 mm long, exserted. Ovary c. 2.5 mm across, globose. Drupe 4-lobed, 0.8-1.2 cm across, subglobose, dark-purple; seeds 2-4, 4-5 mm across, globose.

Valayamchal near Farm, 26300

Fl. & Fr.: August-December

Distribution: Moist deciduous forests and Plantations.

TECTONA L.f., Suppl. Pl. 20. 151. 1781. *nom. cons.*

Tectona grandis L. f., Suppl. Pl. 151. 1781; Hook. f., Fl. Brit. India 4: 570. 1885; Gamble, Fl. Pres. Madras 1092(765). 1924; Manilal & Sivar., Fl. Calicut 231. 1982; Ansari, Fl. Kasaragod Div. 298. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 358. 1988; Rajendran & Daniel, Indian Verbenaceae 320. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 644. 2009.

Deciduous trees, to 30 m high, bark 10-20 mm thick, yellowish-brown, rough, shallowly vertically fissured, fibrous; bole often fluted at base; branchlets 5-10 mm thick, 4-angled, puberulous. Leaves simple, opposite, 30-60 x 15-30 cm, ovate, obovate, apex acute or obtuse, base attenuate, margin entire, wavy, glabrous above and pubescent below with minute red glands, coriaceous; petiole 10-50 mm long, stout, tomentose; lateral nerves 8-10 pairs, pinnate, prominent, raised beneath, puberulent beneath; intercostae scalariform, prominent. Flowers bisexual, white, 7 mm across, in terminal cymose panicles, 10-30 cm across, puberulous. Calyx 5 mm long, campanulate, lobes 5-6, subequal, ovate, tomentose. Corolla 6 mm long, lobes 5-6, oblong, spreading. Stamens 5-6, equal, erect, inserted at the throat, exserted; filaments 3 mm; anthers oblong. Ovary globose, superior, densely hairy, 4-celled, 1 ovule in each cell; style slender, 4 mm; stigma linearly bifid. Fruit a drupe, 1.5-2 cm across, globose, brown, densely floccose hairy, covered by the inflated calyx, epicarp spongy, endocarp stony; seeds 1-4, oblong.

Kariyenkappu, *KJD 22530*

Fl. & Fr.: May-January

Distribution: Raised in Plantations at Kariyenkappu, Bhoothamkallu and 55 block.

VITEX L., Sp. Pl. 638. 1753.

- 1a. Leaves grey-pubescent beneath *V. negundo*
 1b. Leaves glabrous 2
 2a. Flowers in terminal tomentose panicles; petiole winged *V. altissima*
 2b. Flowers in axillary corymbose dichasial cymes; petiole not winged *V. leucoxydon*

Vitex altissima L. f., Suppl. Pl. 294. 1781; Hook. f., Fl. Brit. India 4: 584. 1885; Gamble, Fl. Pres. Madras 1102(772). 1924; Ansari, Fl. Kasaragod Div. 299. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 359. 1988; Rajendran & Daniel, Indian Verbenaceae 344. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 645. 2009. *Vitex alata* Willd., Gen. Naturf. Fr. New Schr. 4: 203. 1803, non Heyne ex Roth 1821; Hook. f., Fl. Brit. India 4: 584. 1885. *Vitex altissima* L.f. var. *alata* (Willd.) Trimen, Handb. Fl. Ceylon 3: 358. 1895; Manilal & Sivar., Fl. Calicut 228. 1982.

Trees, to 30 m high, bark 10-13 mm thick, greyish-yellow, scaly; branchlets lenticellate, minutely tomentose. Leaves compound, opposite, leaflets 3-5, sessile, 6-18 x 2-5 cm, lanceolate, elliptic-lanceolate, or oblanceolate, apex acuminate, base cuneate or acute, margin entire, glabrous above and pubescent or glabrescent along the nerves below, chartaceous; rachis 3.5-6 cm long, slender, pubescent, winged in sapling leaves, wings auriculate at base; lateral nerves 10-16 pairs, pinnate, puberulent beneath, slender, prominent; intercostae reticulate, prominent. Flowers bisexual, white, tinged with blue, in terminal panicles; bracts lanceolate, 3 mm long, caudicous; Calyx densely tomentose, shortly 5 lobed, ovate. Corolla 5 mm long, 2 lipped, upper lip of 2 and lower lip of 3 lobes, obtuse, throat villous. Stamens 4, didynamous, exserted; filaments hairy at base. Ovary globose, 1 mm, superior, densely hairy, 2-4-celled, 4 ovuled; style filiform; stigmas bifid. Fruit a drupe, 5 x 5 mm, smooth, globose, glabrous, blue, supported by enlarged calyx; seeds 4, obovate.

Kannadivechakunnu, *KJD 26195*

Fl. & Fr.: March-July

Distribution: Fairly common in Evergreen forests of Kannadivechakunnu and Meenmutty.

Vitex leucoxylon L. f., Suppl. Pl. 293. 1781; Hook. f., Fl. Brit. India 3: 587. 1885; Gamble, Fl. Pres. Madras 1103(772). 1923; Manilal & Sivar., Fl. Calicut 228. 1982; Rajendran & Daniel, Indian Verbenaceae 356. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 646. 2009. *Wallrothia leucoxylon* (L. f.) Roth, Nov. Pl. Sp. 391. 1821.

Deciduous trees, to 20 m high, bark yellowish-grey or greyish-brown, rough. Leaves opposite, decussate, leaflets 3-5, whorled, 2.5-16 x 1.5-4 cm, elliptic, elliptic-oblong or lanceolate, base acute or attenuate, apex acute or obtusely acuminate, margin entire, glabrous above, puberulent beneath, coriaceous; rachis 5.5-8.5 cm, slender, swollen at the base; lateral nerves 5-14 pairs, pinnate, prominent, intercostae reticulate. Flowers bisexual, in axillary corymbose cymes, to 17 cm long; pedicels to 2 mm. Calyx cupular, sparsely appressed puberulent; tube 2 mm long, 5-toothed. Corolla white, bilipped, purplish-pubescent in the throat; lobes 5. Stamens 4, didynamous, inserted below the throat of the corolla tube, slightly exserted; filaments thickened and villous towards the base; anthers purple. Ovary superior, globose; style filiform; stigma bifid. Fruit a drupe, 1.2-2 cm long, obovoid, purple-black, fleshy.

Valayamchal, *KJD 31483*

Fl. & Fr.: March-July

Distribution: Rare along river banks in Semi-evergreen forests at Valayamchal.

Vitex negundo L., Sp. Pl. 638. 1753; Hook. f., Fl. Brit. India 4: 583. 1885; Gamble, Fl. Pres. Madras 1102(771). 1924; Manilal & Sivar., Fl. Calicut 228. 1982; Ansari, Fl. Kasaragod Div. 299. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 359. 1988; Rajendran & Daniel, Indian Verbenaceae 362. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 646. 2009. *Vitex trifolia* Graham, Cat. 155. 1839, non L. 1753. *Vitex negundo* L. var. *purpurascens* Sivar. & Moldenke, Phytologia 28:404. 1974; Manilal & Sivar., Fl. Calicut 229. 1982; Rajendran & Daniel, The Indian Verbenaceae 366. 2002.

Shrubs or small trees; purple pubescent all over, aromatic. Leaves 3-5-foliolate; leaflets 6-13 x 2-5 cm, narrowly oblong or elliptic to lanceolate, base acute, apex acuminate. Panicles terminal, 10-25 cm long. Calyx 5-toothed obconic, c. 3 mm long, teeth triangular. Corolla deep purple to violet, ca. 7 mm across, hypocrateriform; tube 3-5 mm long, puberulent without, upper lipped 2-lobed, lower 3-lobed with the middle lobe larger, obovate, undulate-margined, other lobes shorter, subequal, obtuse. Stamens 4, filaments purple. Ovary c. 1 mm long; style purple; stigma 2-fid. Drupe 3-5 mm across, globose, purple or black.

Paripode, *NS & KVB 31386*

Fl. & Fr.: February-July

Distribution: Planted in settlements.

LAMIACEAE/ LABIATE

- 1a. Calyx deeply divided, lobes longer than the tube; leaves in whorls of three..... Colebrookea
- 1b. Calyx lobed or toothed, lobes as long as the tube or shorter; leaves opposite 2

- 2a. Calyx 8-10-toothed Leucas
 2b. Calyx 5-toothed, lobed or 2-lipped 3
 3a. Calyx 5-toothed or lobed, equal or subequal 4
 3b. Calyx 2-lipped, lobes unequal 9
 4a. Nutlets fleshy; calyx with stalked stellate tomentum Gomphostemma
 4b. Nutlets dry; calyx without stellate tomentum 5
 5a. Stamens spreading; corolla lobes 4 Pogostemon
 5b. Stamens declinate; corolla lobes 5 6
 6a. Calyx aristately 5-toothed, throat villous Hyptis
 6b. Calyx 5-lobed, throat naked 7
 7a. Calyx equally 5-lobed; lower lip of corolla 3-lobed Anisomeles
 7b. Calyx subequally 5-lobed; lower lip of corolla 4-lobed 8
 8a. Cymes dichasial arranged in thyrses or false verticels Plectranthes
 8b. Cymes paniculate Isodon
 9a. Flowers in uninterrupted spikes forming oblong or ovoid heads 10
 9b. Flowers in interrupted whorls forming lax spikes or thymes 11
 10a. Staminal filaments free; lower lip of corolla declinate, flat Platostoma
 10b. Staminal filaments paired; lower lip of corolla elongated, concave Anisochilus
 11a. Upper lip of calyx 3-lobed, as broad as or nearly broad as the lobes of
 lower lip 12
 11b. Upper lip of calyx 1-lobed, much broader; lower lip narrowly toothed or
 linear aristate 13
 12a. Calyx lobes obscure; lip pouched; anthers of upper pair of stamens 2-celled
 and lower pair 1-celled Scutellaria
 12b. Calyx lobes distinct; lip not pouched; all stamens 2-celled Teucrium
 13a. Staminal filaments fused at the base forming a sheath around the style Coleus
 13b. Staminal filaments free 14
 14a. Corolla as long as the calyx; anthers 1-celled Ocimum
 14b. Corolla much longer than the calyx; anthers 2-celled Orthosiphon

ANISOCHILUS Wall. ex Benth., in Lindley, Edward's Bot. Reg. 15: t. 1300.
 1830.

Anisochilus carnosus (L. f.) Wall. ex Benth. in Wall., Pl. Asiat. Rar. 2: 18.
 1830; Hook. f., Fl. Brit. India 4: 627. 1885; Gamble, Fl. Pres. Madras
 1127(788). 1924; Manilal & Sivar., Fl. Calicut 235. 1982; Ramach. & V.J. Nair,
 Fl. Cannanore Dist. 361. 1988; Suddee & Paton, Kew Bull. 64: 240. 2009;
 Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 648. 2009. *Lavandula carnosa*
 L. f., Suppl. Pl. 273. 1781.

Semisucculent annual herbs, branchlets pubescent. Leaves simple,
 opposite, 2-5 x 2-3.5 cm, broadly ovate, apex obtuse, base truncate or cordate,
 margin crenate-serrate, verrucose above, pubescent below, subsucculent;
 petiole to 4 cm long. Flowers in terminal simple or paniced, 1.5-3 cm long,
 oblong spikes. Calyx 4 mm long, tubular, mouth oblique, 2-lipped, acute;
 upper lip pubescent without, deflexed in fruits. Corolla purple, 1 cm long,
 lobes 5, 2-lipped, upper lip entire, lower 4-lobed. Stamens 4, exerted;
 filaments connate at base forming a sheath. Fruits of 4, ovoid nutlets; seeds
 orbicular, smooth.

Pothanplavu, *KJD 22566*

Fl. & Fr.: September-December

Distribution: Rare in Semi-evergreen forests of Pothanplavu.

ANISOMELES R. Brown, Prodr. 503. 1810.

Anisomeles indica (L.) O. Ktze., Rev. Gen. Pl. 2: 512. 1891; Gamble, Fl. Pres.
 Madras 1140(797). 1924; Manilal & Sivar., Fl. Calicut 240. 1982; Ansari, Fl.

Kasaragod Div. 301. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 362. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 649. 2009. *Nepeta indica* L., Sp. Pl. 571. 1753. *Anisomeles ovata* R. Br. in Ait.f., Hort. Kew. (ed. 2) 3: 364. 1811; Hook. f., Fl. Brit. India 4: 672. 1885. *Anisomeles heyneana* Benth. in Wall., Pl. Asiat. Rar. 1: 59. 1830; Hook. f., Fl. Brit. India 4: 672. 1885; Gamble, Fl. Pres. Madras 1140(797). 1924.

Erect, aromatic woody herbs, 1-1.5 m high, stem 4-angled, grooved on opposite sides, densely pubescent. Leaves simple, opposite, 3-7 x 2.5-4.5 cm, broadly ovate to obovate, apex acute, base truncate, margin coarsely serrate-crenate, tomentose on both sides; petiole to 3 cm long. Flowers in axillary sessile clusters or in terminal interrupted spikes. Calyx campanulate; tube 4-5 mm long; lobes 5. ca. 2 mm long, ovate, ciliate on margin. Corolla pale pink, 1-1.4 cm long, 2-lipped. Stamens 4, didynamous, exserted; filaments hairy; anthers of upper pair 2-celled, of lower 1-celled. Ovary 4-partite; style slender; stigma 2-fid; disc subentire. Nutlets 4, lenticular, reddish-brown.

Paripode, *KJD 22567*

Fl. & Fr.: January-April

Distribution: Along the boundaries of Farm.

COLEBROOKEA J. J. Smith, Exot. Bot. 2: 111. 1806.

Colebrookea oppositifolia Smith, Exot. Bot. 2: 111, t.115. 1805; Hook. f., Fl. Brit. India 4: 642. 1885; Gamble, Fl. Pres. Madras 1138(796). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 363. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 649. 2009. *Colebrookea tenuifolia* Roxb., Pl. Corom. t. 245. 1815.

Large shrubs; stem and leaves densely tomentose. Leaves simple, opposite, to 20 x 6 cm, elliptic, acuminate, crenulate, base acute to acuminate, nerves ca. 10 pairs, oblique. Spikes to 10 x 0.5 cm, paniced, terminal, densely tomentose; flowers in close whorls. Calyx 1.5 mm long; tube very short, densely white-hairy, lobes subulate. Corolla 2 mm long, equally 4-lobed. Stamens 4, exserted in male flowers, included in female flowers, filaments glabrous; style 2-fid at tip. Nutlets hairy at apex; fruiting calyx enlarged.

Kannadivechakunnu, *KVB 31504*

Fl. & Fr.: January-May

Distribution: Fairly common in Evergreen forests of Kannadivechakunnu.

GOMPHOSTEMMA Wall. ex Benth. in Wall., Pl. Asiat. Rar. 2: 12. 1831.

Gomphostemma heyneanum Benth. in Wall., Pl. Asiat. Rar. 2: 12. 1830; Gamble, Fl. Pres. Madras 1167(808). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 364. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 650. 2009. *Gomphostemma strobilinum* Wall. ex Benth. var. *heyneanum* (Benth.) Hook.f., Fl. Brit. India 4: 696. 1885.

Subshrubs; stem obtusely 4-angular, densely covered with stellate hairs. Leaves simple, opposite, to 25 x 15 cm, broadly elliptic, acute at both ends, thickly stellate hairy below, sparsely hairy above, crenate; nerves 5-7 pairs; petiole 4-6 cm long. Racemes to 18 x 2.5 cm; flowers 10 to 20 together, densely packed; bracts elliptic, acute. Calyx 12 mm long, lobed to the middle, lobes lanceolate. Corolla 15 mm long, tube 7 mm broad, cylindric, midlobe of lower lip obtuse, emarginate; filaments unequal, glabrous. Nutlets glabrous.

Near Ambalappara, *KJD 25475*

Fl. & Fr.: October-December

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

HYPTIS N. J. Jacquin, Collectanea 1: 101, 103. 1787.

Hyptis suaveolens (L.) Poit., Ann. Mus. Natl. Hist. Nat. Paris 7: 472. t.27. f.2. 1806; Hook. f., Fl. Brit. India 4: 630. 1885; Gamble, Fl. Pres. Madras 1129(789). 1924; Manilal & Sivar., Fl. Calicut 240. 1982; Ansari, Fl. Kasaragod Div. 304. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 364. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 650. 2009. *Ballota suaveolens* L., Syst. Nat. (ed. 10) 1100. 1759.

Shrubs, to 1.5 m high; stem obtusely 4-angular, viscous hairy. Leaves simple, opposite, to 7 x 5 cm, ovate, acute, hispid below, glabrate above; lateral nerves 5-7 pairs; petiole to 3 cm long. Flowers in axillary short cymose racemes. Calyx tube 8 mm long, tubular, 10-ribbed, glandular hairy, teeth spinulose, 4 mm long. Corolla 5 mm long, lobes short, glabrous inside, blue. Stamens 4, declinate, filaments free, pubescent; anthers confluent. Ovary 4-partite; style subentire. Nutlets 4 x 2.5 mm, oblong, compressed, with a ridge on dorsal surface, pubescent, deep brown, mucilaginous when wet.

Paripode, KVB 31286

Fl. & Fr.: August-February

Distribution: Along the margins of Semi-evergreen forests at Paripode.

ISODON (Schrader ex Benth.) Spach, Hist. Nat. Veg. Phan. 9:162. 1840.

- 1a. Leaf base obtuse to cuneate, glabrescent; fruiting calyx teeth rounded..... *I. lophanthoides*
1b. Leaf base cordate or rounded, tomentose beneath; fruiting calyx teeth acute *I. wightii*

Isodon lophanthoides (Buch.-Ham. ex D.Don) H.Hara, J. Jap. Bot. 60: 235. 1985. *Hyssopus lophanthoides* Buch.-Ham. ex D.Don, Prodr. Fl. Nepal. 110. 1825. *Plectranthus stocksii* Hook. f., Fl. Brit. India 4: 618. 1885; Gamble, Fl. Pres. Madras 1121(784). 1924; Sasidh., Fl. Periyar Tiger Reserve 322. 1998.

Herbs, often decumbent at base; stem densely glandular-hairy. Leaves simple, opposite, 6 x 5 cm, acute at apex, crenate-serrate, glabrous above, covered with red glands below; petiole 5-7 cm long. Flowers many in short cymes forming terminal panicles, 10-25 cm long, with slender branches. Calyx 3 mm long, 5-ribbed, densely red-glandular, hirtus, upper lip 2-lobed. Corolla 7 mm long, lower lip concave, obtuse, white. Stamens 4, declinate, exerted.

Ambalappara, KVB 31565, 31684

Fl. & Fr.: July-January

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Western Ghats.

Isodon wightii (Benth.) Hara, J. Japan Bot. 60: 237.1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 651. 2009. *Plectranthus wightii* Benth., Labiat. Gen. Spec. 41. 1832; Hook. f., Fl. Brit. India 4: 619. 1855; Gamble, Fl. Pres. Madras 1120(784). 1924. *Plectranthus pulneyensis* Hook. f., Fl. Brit. India 4: 617. 1855. *Plectranthus nepetaefolius* Benth. in DC., Prodr. 12: 57. 1848; Hook. f., Fl. Brit. India 4: 619. 1855. *Robdosia wightii* (Benth.) Hara, J. Jap. Bot. 47: 203. 1972; Sivar. & Mathew, Fl. Nilambur 555. 1997.

Subshrubs, branchlets glabrescent. Leaves simple, opposite, ovate, acute, base cordate, deeply serrate, membranous, sparsely hispid, to 7.5 x 6 cm; lateral nerves ca. 5 pairs; petiole to 7 cm long. Thyrsus to 15 cm long. Calyx hirtellous, red gland-dotted. Corolla lobes glabrous. Stamens exerted.

Ambalappara, NS & KJD 31983; KVB 31648, 31649

Fl. & Fr.: September-December

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Peninsular India.

LEUCAS R. Brown, Prodr. 504. 1810.

- 1a. Mouth of the calyx oblique..... 2
- 1b. Mouth of the calyx straight..... 3
- 2a. Calyx teeth minute, scabrous *L. lavandulifolia*
- 2b. Calyx teeth with bulbous based hairs *L. aspera*
- 3a. Throat of calyx tube glabrous *L. angularis*
- 3b. Throat of calyx tube villous 4
- 4a. Calyx mouth with white hairs, teeth small; leaves linear-elliptic *L. eriostoma*
- 4b. Calyx mouth with brown hairs, teeth long; leaves elliptic or ovate-elliptic .. *L. ciliata*

Leucas angularis Benth. in Wall., Pl. Asiat. Rar. 1: 62. 1830; Hook. f., Fl. Brit. India 4: 684. 1885; Gamble, Fl. Pres. Madras 1151(805). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 365. 1988; V. Singh, Monogr. Indian Leucas 38. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 652. 2009. *Leucas marrubioides* Desf. var. *pulneyensis* Hook.f., Fl. Brit. India 4: 684. 1885.

Prostrate branching herbs, pubescent. Leaves simple, opposite, 3.5 x 1.5 cm, ovate, obtuse, base rounded or truncate, serrate, pubescent; petiole 0.5 cm. Verticils axillary, 4-6 flowered; bracts 3 mm, linear, ciliate. Calyx tube 8 mm, 10 toothed, unequal, to 2 mm, long, ciliate. Corolla tube 9 mm, subequal; filaments 5 and 7 mm, pubescent. Ovary 1 mm, style 1.3 mm.

Kariyenkappu, *KJD 31867*

Fl. & Fr.: March-July

Distribution: Rare in plantations of Kariyenkappu and Evergreen forest of Chavachi.

Leucas aspera (Willd.) Link, Enum. Hort. Berol. Alt. 2: 113. 1822; Hook. f., Fl. Brit. India 4: 690. 1885; Gamble, Fl. Pres. Madras 1150(803). 1924; Manilal & Sivar., Fl. Calicut 239. 1982; Ansari, Fl. Kasaragod Div. 305. 1985; V. Singh, Monogr. Indian Leucas 43. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 653. 2009. *Phlomis aspera* Willd., Enum. Hort. Berol. 2: 621. 1809.

Erect hirsute herbs to 40 cm tall. Leaves simple, opposite, 3-8 x 1-2 cm, linear-lanceolate, apex acute, base cuneate, margin distantly serrate, puberulous, petiole 3 mm long. Verticils terminal and axillary; bract linear, equalling calyx, hirsute. Calyx 6 mm long, tubular, 10-ribbed, upper half strigose without, glabrous below; mouth oblique, 10-toothed; teeth unequal, posterior the longer, linear, c.1 mm long. Corolla white; tube c. 6 mm long; upper lip c. 3 mm long, villous without; lower lip 7-8 mm long. Stamens 4. Style c. 8 mm long.

Paripode, *KJD 25584*

Fl. & Fr.: September-January

Distribution: Fairly common along riversides in Semi-evergreen forests of Paripode, Narikkadavu and Pookundu.

Leucas ciliata Benth. ex Wall., Pl. Asiat. Rar. 1: 61. 1830; Hook. f., Fl. Brit. India 4: 687. 1885; Gamble, Fl. Pres. Madras 1153(806). 1924; Ansari, Fl. Kasaragod Div. 306. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 366. 1988; V. Singh, Monogr. Indian Leucas 61. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 654. 2009.

Subscandent hispid herbs with few branches. Leaves simple, opposite, 8 x 3 cm, ovate, acute at both ends, densely hispid; petiole 1 cm long. Verticils terminal, 3 cm across, globose; bracts 15 x 1 mm, strongly ciliate; flowers 30-40 in a head, densely packed. Calyx tube 12 mm long, not ribbed, teeth 5 mm long, ciliate. Corolla tube 10 mm long, upper lip obovate, concave, brown hairy, lower lip white, 10 x 8 mm, 3-lobed, midlobe orbicular, glabrous. Nutlets 3 x 1.5 mm, 3-angled brown, smooth.

Ambalappara, KVB 31503

Fl. & Fr.: September-March

Distribution: Rare in Evergreen forests of Ambalappara.

Leucas eriostoma Hook.f., Fl. Brit. India 4: 686. 1885; Gamble, Fl. Pres. Madras 1154(806). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 366. 1988; Sasidh. et al., Bot. Stud. Med. Pl. Kerala 31.1996; V. Singh, Monogr. Indian Leucas 82. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 654. 2009.

Stout, suffruticose undershrubs, to 1 m high; stem and branches 4-gonous, hispid with long spreading hairs, degree of hairiness highly variable. Leaves simple, opposite, 5-10 x 0.5-4 cm, linear, linear-lanceolate or lanceolate, obtuse or acute, narrowed at base to the short petiole, obtusely serrate, hirsute both sides with long spreading hairs, thick, gland-dots inconspicuous; veins 5-7 pairs, very oblique, raised beneath, impressed above. Verticils 1-2.5 cm in diam., terminal and axillary; bracts 7-9 mm long, as long as calyx or longer, linear, plumose or pectinately villous, tips recurved or not. Calyx-tube 5-10 mm long, tubular-campanulate, straight, narrowed above the nutlets, ribbed and hispid in the upper part, glabrous in lower region; mouth truncate; teeth 10, about 1 mm long, equal, linear-subulate, sparsely hairy, ciliate, erect, not recurved. Corolla-tube included within the calyx, pilose annulate within towards base, hairy outside at the top; lips almost equal, upper one bearded with long white hairs, lower lip 3-lobed and pubescent on outer surface. Anthers glabrous. Nutlets ca 2 mm long, oblong.

Ambalappara, KVB 31642, 31647

Fl. & Fr.: November-March

Distribution: Common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Leucas lavandulifolia J.E. Smith in Rees, Cyclop. 20: n. 2. 1812; V. Singh, Monogr. Indian Leucas 104. 2001; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 655. 2009. *Leonurus indicus* L., Syst. Nat. (ed.10) 1101. 1759. *Leucas indica* (L.) R. Br. ex Vatke in Oesterr., Bot. Zeits. 25: 95. 1875, *nom. illeg.*; Ansari, Fl. Kasaragod Div. 307. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 366. 1988. *Leucas malabarica* W.Theob. in F.Mason, Burmah ed. 3, 2: 296. 1883. *Phlomis linifolia* Roth, Nov. Pl. Sp. 260. 1821. *Leucas linifolia* (Roth) Spreng., Syst. Veg. 2: 743. 1825; Hook. f., Fl. Brit. India 4:690. 1885; Gamble, Fl. Pres. Madras 1149 (803). 1924. *Leucas linifolia* (Roth) Spreng. var. *decipiens* Hook. f., Fl. Brit. India 4: 691. 1885. *Leucas lavandulifolia* Rees var. *decipiens* (Hook.f.) Chandrab. & Sriniv., Bull. Bot. Surv. India 17: 164. 1975. *Leucas indica* var. *decipiens* (Hook.f.) Bennet, J. Econ. Taxon. Bot. 5: 452. 1984.

Auunal herbs, to 40 cm tall; branches puberulous. Leaves simple, opposite, 4-7 x 0.6-1.3 cm, linear-lanceolate, apex acute, base attenuate, margin subentire, hairy on veins and on margins; petiole 4-5 mm long.

Flowers in dense axillary verticals; bract 5-6 mm long, linear, hairy. Calyx tube 4-5 mm long, tubular, slightly curved, pubescent, shortly 8-toothed, one slightly longer, mouth oblique. Corolla white; tube 2-3 mm long, 2-lipped; upper lip 1-2 mm long, lower 5-6 mm long, 3-lobed. Stamens 4, didynamous; filaments sparsely hairy. Ovary 4-celled; ovules 4; stigma 2-fid. Nutlets 4, minute.

Paripode, *KJD 31480*

Fl. & Fr.: July-October

Distribution: Common along river sides of Paripode, Narikkadavu and Pookundu.

OCIMUM L., Sp. Pl. 597. 1753.

1a. Small herbs; fruiting calyx villous inside; seeds smooth*O. americanum*

1b. Shrubs; fruiting calyx glabrous inside; seeds rugose*O. gratissimum*

Ocimum americanum L., Cent. Pl. 1: 15. 1755; Manilal & Sivar., Fl. Calicut 236. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 657. 2009. *Ocimum canum* Sims, Bot. Mag. 51: t.2452. 1823; Hook. f., Fl. Brit. India 4: 607. 1885; Gamble, Fl. Pres. Madras 1111(777). 1924; Ansari, Fl. Kasaragod Div. 308. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 368. 1988.

Woody herbs, stem hirtus. Leaves simple, opposite, to 3 x 1.5 cm, elliptic, acute to acuminate, base truncate or obtuse, subentire, sparsely hairy or glabrous; petiole to 2 cm long. Racemes to 13 cm long, densely pubescent; flowers 5-7 in each whorl. Calyx 3 x 5 mm, upper lip 3 x 3 mm, orbicular, densely hairy. Corolla white, 5 mm long, glabrous. Staminal filaments glabrous. Nutlets 1.5 mm long, sub-triangular, minutely pitted, dark brown.

Near Farm, *KJD 26263*

Fl. & Fr.: Through out the Year

Distribution: Along the boundaries near Farm.

Ocimum gratissimum L., Sp. Pl. 1197. 1753; Hook. f., Fl. Brit. India 4: 608. 1885; Gamble, Fl. Pres. Madras 1111(777). 1924; Manilal & Sivar., Fl. Calicut 236. 1982; Ansari, Fl. Kasaragod Div. 308. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 368. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 658. 2009.

Shrubs, to 2 m high; stem glandular-scabrid. Leaves simple, opposite, to 12 x 6 cm, elliptic to obovate, acuminate at apex, base attenuate serrate; nerves 6-pairs; thinly tomentose below; petiole to 6 cm long. Racemes terminal, panicles; bracts oblanceolate; flowers 4-6 at each node; pedicel 4 mm long. Calyx 5 mm long, glabrous; upper lip ovate, obtuse, lobes of lower lip acuminate, glandular. Corolla white, tube 2-3 mm long, lobes obtuse. Staminal filaments glabrous or villous at base; anthers sagittate at base. Nutlets 1.5 x 1 mm, pitted, brown.

Near Farm, *KJD 22546*

Fl. & Fr.: August-December

Distribution: Along the boundaries near Farm.

ORTHOSIPHON Benth., Edward's Bot. Reg. 15: t. 1300. 1830.

Orthosiphon aristatus (Blume) Miq., Fl. Ind. Bat. 2: 943. 1858; Sunil & Sivadasan, Fl. Alappuzha Dist. 583. 2009. *Ocimum aristatum* Blume, Bijdr. 833. 1826. *Orthosiphon stamineus* Benth. in Wall., Pl. Asiat. Rar. 2: 15. 1830; Hook. f., Fl. Brit. India 4: 615. 1885; Gamble, Fl. Pres. Madras 1115(780). 1924.

Diffusely branched perennial herbs. Leaves simple, opposite, 3-6.5 x 1.2-3.5 cm, rhomboid to ovate-deltoid, apex acute, base cuneate, margins serrate from about the middle upwards, glandular-punctate beneath. Recemes 8-16 cm long; verticils lax; peduncle strigulose with purplish hairs; bracts c.1 x 2 mm, broadly ovate. Calyx tube to 3 mm long, 10-nerved; upper lip to 3 mm long, broadly ovate, purplish; lower lip longer. Corolla white, tomentose without; tube 1-1.5 cm long; upper lip orbicular; lower lip as long as upper, boat-shaped. Stamens exserted; filaments to 3 cm long. Nutlets c. 2 mm long, ovoid-oblong.

Kariyenkappu, *KJD 26110*

Fl. & Fr.: September-December

Distribution: Near streams at Kariyenkappu.

PLATOSTOMA P. Beauv., Fl. Oware 2: 61, t. 95. 1818.

Platostoma hispidum (L.) Paton, Kew Bull. 52: 273. 1997. *Gomphrena hispida* L., Sp. Pl. 1: 326. 1762. *Acrocephalus hispidus* (L.) Nicolson & Sivad., Taxon 29: 324. 1980; Manilal & Sivar., Fl. Calicut 235. 1982; Ansari, Fl. Kasaragod Div. 300. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 361. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 647. 2009. *Prunella indica* Burm.f., Fl. Ind. 130. 1768. *Acrocephalus indicus* (Burm.f.) O. Ktze., Rev. Gen. Pl. 2: 511. 1891; Gamble, Fl. Pres. Madras 1115(780). 1924. *Acrocephalus capitatus* (Roth) Benth., Bot. Reg. 15. sub t. 1282. 1829; Hook. f., Fl. Brit. India 4: 611. 1885. *Ocimum capitatum* Roth, Nov. Pl. Sp. 276. 1821.

Erect annual herbs; stem 4-angled and ridged, villous along ridges. Leaves simple, opposite, 1-2.5 x 0.5-1 cm, ovate-lanceolate or elliptic-lanceolate, apex acute, base narrowly attenuate, margins coarsely serrate, thinly pubescent on nerves beneath; petiole to 1 cm long. Flowers grouped in terminal globose, ovoid or short cylindrical heads, 0.5-1.5 cm long, subtended by a pair of floral leaves and many bracts. Calyx 2 mm long, tubular, 2-lipped, upper lip entire, lower usually 4-toothed. Corolla white turning brownish, c. 4 mm long, 2-lipped, upper lip subequally 4-lobed. Stamen 4, didynamous; anthers 1-celled. Ovary 4-partite; style slender; stigma shortly 2-fid; nutlets 4, minute, smooth.

Kariyenkappu, *KJD 26286*

Fl. & Fr.: September-December

Distribution: Along forest boundaries at Kariyenkappu and Chavachi.

PLECTRANTHUS L' Heritier, Stirp. Novae 84. 1788.

Plectranthus malabaricus (Benth.) Willemse, Blumea 25: 509. 1979; Ramach. & V.J. Nair, Fl. Cannanore Dist. 370. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 660. 2009. *Coleus malabaricus* Benth. in Wall., Pl. Asiat. Rar. 2: 16. 1830; Hook. f., Fl. Brit. India 4: 626. 1885; Gamble, Fl. Pres. Madras 1124(786). 1924; Ansari, Fl. Kasaragod Div. 302. 1985.

Herbs, stem 4-angled, purplish. Leaves simple, opposite, to 15 x 13 cm, ovate, obtuse or acute, base truncate or subcordate, puberulous; lateral nerves 4 or 5 pairs; petiole to 10 cm long. Panicles terminal, to 30 cm long. Calyx striate, upper lip broadly ovate, lower 3-lobed, lobes ovate-lanceolate. Corolla white with purple tinge, 1 cm long. Stamens exserted, filaments glabrous. Nutlets smooth.

Ambalappara, *NS & KVB 31414*

Fl. & Fr.: August-December

Distribution: Common in Evergreen forests of Mullenpara, Asthippara and Ambalappara.

POGOSTEMON Desf., Mem. Mus. Hist. Nat. 2: 154. 1815.

- 1a. Flowers yellow in few-flowered axillary cymose panicles *P. peethapushpam*
- 1b. Flowers clustered on simple or paniced spikes 2
- 2a. Flowers clusters distant in terminal and axillary panicles 3
- 2b. Flowers in uninterrupted spikes 4
- 3b. Flower clusters 1-sided on the spikes; hairs on the filaments
few, white *P. paniculatus*
- 3b. Flowers clustered on all sides of the spikes; filaments densely bearded,
Purple *P. purpurascens*
- 4a. Leaves oblong or orbicular; corolla and staminal hairs white *P. mollis*
- 4b. Leaves ovate; staminal filaments purple 5
- 5a. Staminal filaments hairy only at the base *P. gardneri*
- 5b. Staminal filaments hairy throughout *P. benghalensis*

Pogostemon benghalensis (Burm. f.) O. Ktze., Rev. Gen. Pl. 2: 517. 1891; Ramach. & V.J. Nair, Fl. Cannanore Dist. 371. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 661. 2009. *Origanum benghalense* Burm. f., Fl. Ind. 128,t.38, f. 3. 1768. *Pogostemon plectranthoides* Desf., Ann Mus. Natl. Hist. Nat. Paris 2: 156. t. 6. 1808; Hook. f., Fl. Brit. India 4: 632. 1885; Gamble, Fl. Pres. Madras 1133(793). 1924.

Shrubs to 1. 5 m tall, stem subterete, reddish-brown. Leaves simple, opposite, 11 x 5 cm, ovate to ovate-lanceolate, acute, attenuate at base, irregularly serrate-dentate, chartaceous; lateral nerves ca 5 pairs; petiole to 3 cm. Spike to 15 cm, cylindrical, terminal; bracts ovate, bracteoles lanceolate; flowers many, densely packed. Calyx 4 mm long; lobes 5, equal. Corolla pale pink; lobes 4, equal, obtuse, villous at apex. Stamens 4, filaments unequal, bearded with moniliform hairs. Ovary glabrous, style slender, stigma 2-lobed. Nutlets glabrous, smooth, brown.

Crossway, 22573

Fl. & Fr.: January-March

Distribution: Fairly common along the margins of Grasslands at Ambalappara.

Pogostemon gardneri Hook.f., Fl. Brit. India 4: 632. 1885; Gamble, Fl. Pres. Madras 1133(792). 1924; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 662. 2009.

Erect herbs; stem villous, reddish. Leaves simple, opposite, up to 12 x 8 cm, ovate, acute, cuneate at base, inciso-crenate, pubescent; petiole to 1 cm. Flowers small, in terminal paniced spikes; clusters usually close but occasionally interrupted, the floral leaves mostly reflexed; bracts oblong-lanceolate, ciliate, membranous, usually longer than the calyx. Calyx-teeth much shorter than the tube. Corolla pink. Stamens 4, exerted, subequal; filaments bearded; anther-cells confluent. Disk subentire. Ovary 4-partite; style slender, 2-fid with slender stigmatic lobes; nutlets orbicular.

Ambalappara, KVB 31585

Fl. & Fr.: January-May

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats; Conservation status: Endangered.

Pogostemon mollis Benth., Labiat. Gen. Spec. 155. 1833; Hook. f., Fl. Brit. India 4: 635. 1885; Gamble, Fl. Pres. Madras 1134(793). 1924; M. Mohanan & Henry, Fl. Thiruvanthapuram 371. 1994.

Branched subshrub; branchlets several, hirsute, ascending. Leaves simple, opposite, ovate-orbicular, to 3 x 1.5 cm, apex acute, base cuneate to obtuse, margin crenate, tomentose; petiole to 0.5 cm. Racemes spicate, uninterrupted, to 9 cm, mostly terminal; bracts linear. Calyx-lobes 5, subequal, 4.5 mm, tomentose. Corolla white, 3 mm wide; limb obscurely 2-lipped; lobes 6 mm, obtuse. Stamens 4; 3 filaments longer, to 5 mm.

Ambalappara, NS & KJD 25514; KVB 31750

Fl. & Fr.: October-February

Distribution: In Grasslands of Ambalappara. Endemic to Western Ghats.

Pogostemon paniculatus (Willd.) Benth. in Wall., Pl. Asiat. Rar. 1:30.1830; Hook. f., Fl. Brit. India 4: 631. 1885; Gamble, Fl. Pres. Madras 1132(792). 1924; Manilal & Sivar., Fl. Calicut 240. 1982; Ansari, Fl. Kasaragod Div. 309. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 372. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 662. 2009. *Elsholtzia paniculata* Willd., Sp. Pl. 3: 59. 1800.

Subshrubs. Leaves simple, opposite, 8 x 4 cm, ovate, acuminate at either ends, irregularly dentate, densely hirtus-tomentose; lateral nerves 3-4 pairs; petiole 2 cm long, tomentose. Panicle large, terminal and from upper leaf axils, branches 5-10-flowered, 1-sided; bracteoles 5 x 3 mm, oblique, falcate, imbricating regularly. Flowers densely packed. Calyx 4 mm long, 5-ribbed; lobes acuminate, hirtus. Corolla white, 6 mm long; pubescent outside; filaments sparsely hairy.

Moonamtrhode, NS & KVB 31394

Fl. & Fr.: October-February

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Crossway, Chavachi and Moonamthode.

Pogostemon peethapushpum Pradeep, Candollea 53: 419. 1998.

Subshrubs to ca 1.5 m tall, stem and branchlets quadrangular, glabrous, often tinged with purple, sometimes rooting from lower nodes. Leaves simple, opposite, decussate, 6-12 x 5-7 cm, ovate, acute to acuminate at apex, truncate at base, margin doubly serrate-dentate, dark green above and pale beneath, subcoriaceous, 3-5-nerved, nerves prominent beneath, glabrescent on lower surface; petiole 5-8 cm long, glabrous. Inflorescence of few flowered axillary cymose panicles, 5-9 cm long; bracts subulate, 6-8 x 1.0-1.5 mm, sparsely hairy, margin entire, apex subobtuse; bracteoles linear, 2-3 mm long, sparsely hairy. Flowers erect; pedicel 1-6 mm long, glabrous. Calyx tubular, 8-10 mm long, tube 5-6 mm long, prominently 6-nerved, glabrous, 5-toothed, teeth 3-4 mm long, subequal, triangular, acuminate, margin hispid. Corolla yellow, funnel-shaped, 8-9 mm long, tube 6 mm long; upper lip 3-lobed, lobes subequal, rotund, 2 x 2 mm, glabrous inside and densely hispid outside; lower lip entire, ovate-lanceolate, 2.5 x 2 mm, subacute at apex, veins conspicuous. Stamens 4, exserted, didynamous, upper ones 17-19 mm long, lower ones 11-13 mm long, densely hairy towards base; anthers yellow, reniform, 1 mm in diameter, unilocular. Disc ca 1 mm long, subentire, glabrous. Ovary 4-partite, 0.5 mm long, oblong, glandular and simple hairy

dorsally and apically; style 18-22 mm long, slender, bifid at apex; lobes equal, ca. 1 mm long.

Ambalappara, *KVB 31588*

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats of Kerala.

Pogostemon pubescens Benth. in DC., Prodr. 12: 142. 1848; Gamble, Fl. Pres. Madras 1133(792). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 372. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 663. 2009. *Pogostemon parviflorus* Benth. in Wall., Pl. Asiat. Rar. 1: 31. 1830,p.p.; Hook. f., Fl. Brit. India 4: 632. 1885; Mohanan, Fl. Quilon Dist. 326. 1984.

Shrubs. Leaves simple, opposite, ca. 8 x 4 cm, ovate, apex acute, base cuneate, doubly crenate, membranous, sparsely hirsute; petiole to 3.5 cm. Panicles axillary and terminal; bracts 5 x 1 mm, oblong, ciliate. Calyx tube 4 mm, tooth 1 mm, ovate-lanceolate, pubescent. Corolla white with purple shades; tube 3 mm, upper lip, 3-lobed, 5 mm, lower lip 5 mm. Staminal filaments 6 mm long, purple bearded.

Ambalappara, *KJD 18757*

Fl. & Fr.: November-January

Distribution: Rare in Evergreen forests of Amabalappara.

Pogostemon purpurascens Dalz. in Hook.'s J. Bot. Kew. Gard. Misc. 2: 337. 1850; Hook. f., Fl. Brit. India 4: 632. 1885; Gamble, Fl. Pres. Madras 1133(792). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 372. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 663. 2009.

Densely pubescent diffuse herbs. Leaves simple, opposite, to 9 x 6 cm, ovate, acute at apex, oblique at base, irregularly dentate, nerves 4 pairs; petiole 1 cm long. Spikes 10-20-flowered, clustered, racemose or paniced; bracteoles 6 x 4 mm, ovate-falcate, regularly imbricating, hairy; flowers densely packed. Calyx 5 mm long, lobes acute, villous. Corolla 6 mm long; upper lip purple, 6 mm long, lower lip white, lobes acute, hairy. Staminal filaments bearded with purple moniliform hairs. Nutlets trigonous, dark brown, smooth

Kariyenkappu, *KJD 18772*

Fl. & Fr.: January-April

Distribution: Fairly common in the plantations at Kariyenkappu.

SCUTELLARIA L., Sp. Pl. 598. 1753.

Scutellaria violacea Heyne ex Benth. in Wall., Pl. Asiat. Rar. 1: 66. 1830; Hook. f., Fl. Brit. India 4: 668. 1885; Gamble, Fl. Pres. Madras 1142(798). 1924; Ramach. & V.J. Nair, Fl. Cannanore Dist. 373. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 664. 2009. *Scutellaria violacea* Heyne ex Benth. var. *sikkimensis* Hook.f., Fl. Brit. India 4: 668. 1885.

Erect herbs; stem hispid. Leaves simple, opposite, 5 x 4 cm, deltoid, ovate, acute, crenate, base cordate, hispid; lateral nerves 5 or 6 pairs; petiole 1-2 cm long. Racemes to 15 cm long, glandular hispid; bracts ovate, 3 mm long; flowers paired, long-pedicelled. Calyx glabrous, upper lobe 7 x 5 mm, saccate, lower lip 4 x 3 mm. Corolla pale blue, 15 mm long, lateral lobes of lower lip

shorter, glabrous. Staminal filaments fimbriate at base; anthers bearded, confluent. Nutlets spherical, tuberculate.

Ambalappara, *KVB 31586*

Fl. & Fr.: February-March

Distribution: Rare in Evergreen forests of Ambalappara.

TEUCRIUM L., Sp. Pl. 562. 1753.

Teucrium tomentosum Heyne ex Benth. in Wall., Pl. Asiat. Rar. 1: 58. 1830; Hook. f., Fl. Brit. India 4: 700. 1885; Gamble, Fl. Pres. Madras 1158(809). 1924; Sasidh., Fl. Parambikulam WLS 252. 2002.

Erect shrubs; branchlets tomentose. Leaves simple, opposite, to 11 x 6 cm, ovate, acute at apex, rounded at base, crenate, hairy along nerves; petiole 1-3 cm long. Racemes paniced, terminal and axillary; bracts 3 mm long, ovate, small; flowers closely packed; pedicellate. Calyx 6 mm long, lobed near the apex, lobes equal, acute, hairy. Corolla yellow to white, 11 mm long, upper lip absent, lower lip 3-lobed, lateral lobes smaller. Stamens didynamous, filaments glabrous; anthers reniform. Style filiform, stigma bifid. Nutlets 4, basely united, globular, reticulately pitted, glandular.

Pothurumi, *KJD 26307*

Fl. & Fr.: September-December

Distribution: Rare in the lower reaches of Evergreen forests of Ambalappara.

NYCTAGINACEAE

BOERHAVIA L., Sp. Pl. 3. 1753.

Boerhavia diffusa L., Sp. Pl. 3. 1753; Gamble, Fl. Pres. Madras 1162(814). 1925; Manilal & Sivar., Fl. Calicut 242. 1982; Ansari, Fl. Kasaragod Div. 310. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 373. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 665. 2009. *Boerhavia repens* L., Sp. Pl. 3. 1753; Hook. f., Fl. Brit. India 4: 709. 1885; Anil Kumar et al., Fl. Pathanamthitta 404. 2005. *Boerhavia procumbens* Banks ex Roxb., Fl. Ind. 1: 148. 1820.

Herbs with long trailing branches; stem reddish, tomentose. Leaves simple, unequal, ovate, obtuse, undulate along margins, truncate to subcordate at base, tomentose, very variable in size; petiole to 1 cm long. Flowers 4 mm long, 4-10 together, in axillary or terminal, peduncled umbels; bracts 5, ovate, glandular. Perianth pink. Stamens 3. Capsule 3 x 1 mm, clavate, 5-ribbed, glandular.

Paripode, *KJD 22569*

Fl. & Fr. August-December

Distribution: Along forest boundaries at Paripode.

AMARANTHACEAE

- 1a. Leaves opposite 2
- 1b. Leaves alternate 4
- 2a. Flowers in sessile heads; anthers 1-celled Alternanthera
- 2b. Flowers in groups of 3-5, in spikes; anthers 2-celled 3
- 3a. Flowers in groups of three, one fertile and two sterile Cyathula
- 3b. Flowers single in spikes, all fertile Achyranthes
- 4a. Flowers unisexual Amaranthus
- 4b. Flowers bisexual 5

- 5a. Leaves pubescent, stamens interposed with stamionodesAerva
 5b. Leaves glabrous, staminodes absent 6
 6a. Flowers in paniced spikes, fruit indehiscent Indobanalia
 6b. Flowers in globose heads, fruit circumcise dehiscent.....Allmania

ACHYRANTHES L., Sp. Pl. 204. 1753.

- 1a. Bracteoles wings completely adenate to the wings*A. aspera*
 1b. Bracteoles wings adenate at the base only, free above*A. bidentata*

Achyranthes aspera L., Sp. Pl. 204. 1753; Hook. f., Fl. Brit. India 4: 730. 1885; Gamble, Fl. Pres. Madras 1176(823). 1925; Manilal & Sivar., Fl. Calicut 245. 1982; Ansari, Fl. Kasaragod Div. 311. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 375. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 667. 2009.

Large herbs; stem tomentose. Leaves simple, opposite, 6-10 x 3-6 cm, broadly elliptic to obovate, apex abruptly acuminate, tomentose, nerves 6 pairs; petiole 5 mm long. Spike to 20 cm long, hispid; bracts 6 mm long, lanceolate, aristate; bracteoles entire, aristate. Flowers deflexed. Tepals 7.5 x 2 mm, elliptic, acute, glabrous, equal. Ovary truncate at apex. Achenes 3 mm long, ovoid, brown.

Pothurumi, *KJD 26312*

Fl. & Fr.: October-March

Distribution: Fairly common in Evergreen forests of Pothurumi and Plantations of Kariyenkappu.

Achyranthes bidentata Blume, Bijdr. 545. 1826; Gamble, Fl. Pres. Madras 1176(824). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 375. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 667. 2009.

Herbs; stem glabrous. Leaves simple, opposite, 10-16 x 2-2.5 cm, linear-lanceolate, apex acuminate, thinly pubescent; nerves 7-9 pairs; petiole 5 mm long. Spike axillary and terminal, 15-30 cm long, narrow, glabrous; bracts 4 x 1.5 mm, lanceolate, long-aristate; bracteoles 3 mm long, entire, aristate. Flowers distant; tepals equal, 7 x 1.5 mm, lanceolate, acuminate, glabrous. Achenes 3 x 1.5 mm, cylindrical, longitudinally striate, reddish-brown.

Pothurumi, *KJD 25541*

Fl. & Fr.: September-December

Distribution: Fairly common in Evergreen forests of Pothurumi.

AERVA Forssk., Fl. Aegypt.-Arab. 170, 122. 1775, *nom. cons.*

Aerva lanata (L.) Juss. ex Schult., Ann. Mus. Natl. Hist. Nat. Paris 11: 131. 1808; Hook. f., Fl. Brit. India 4: 728. 1885; Gamble, Fl. Pres. Madras 1178(825). 1925; Manilal & Sivar., Fl. Calicut 244. 1982; Ansari, Fl. Kasaragod Div. 312. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 376. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 668. 2009. *Achyranthes lanata* L., Sp. Pl. 204. 1753. *Aerva floribunda* Wight, Ic. t. 723. 1840.

Herbs, white woolly tomentose. Leaves simple, alternate, 3-4 x 3 cm, orbicular to ovate, apex obtuse, mucronate, pubescent above, densely woolly below, membranous; petiole ca. 1 cm. Spikes axillary, to 1 cm, densely tomentose; bracts and bracteoles 1 mm, ovate. Tepals 1.5 mm, oblong, woolly mucronate. Staminal filaments basally connate, 0.5 mm; staminodes subulate. Ovary 0.4 mm.

Valayamchal, *KJD 22561*

Fl. & Fr.: September-April

Distribution: Rare in Semi-Evergreen forests of Valayamchal.

ALLMANIA R Brown ex R.Wight in Hook.'s J. Bot.1: 226. 1834.

Allmania nodiflora (L.) R. Br. ex Wight in Hook.'s, J. Bot. 1: 226. t. 128. 1834; Gamble, Fl. Pres. Madras 1167(817). 1925; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 668. 2009. *Celosia nodiflora* L., Sp. Pl. 205. 1753. *Chamissoa aspera* Wight, Ic. t. 1772. 1852. *Allmania nodiflora* (L.) R. Br. ex Wight var. *longipedunculata* Trimen, Handb. Fl. Ceylon 3: 394. 1895; M. Mohanan & Henry, Fl. Thiruvanthapuram 376. 1994. *Allmania longipedunculata* (Trimen) Gamble, Fl. Pres. Madras 1168(818). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 376. 1988.

Diffuse or erect herbs, stem puberulous. Leaves simple, alternate, 2-6 x 1-1.5 cm, elliptic-oblong, apex acute, entire, glabrous. Flowers in terminal and axillary globose congested cymes, pedicelled; bracts and bracteoles 4 mm long, lanceolate, acuminate with filiform tips. Tepals 5, equal, 5 x 1 mm, lanceolate, acute, free to the base, 1-nerved, glabrous. Stamens 5, filaments united below into a membranous cup, glabrous. Ovary obovoid, 1-celled, 1-ovuled, style 1, slender, stigma 2-toothed. Achenes 3 x 2 mm, ellipsoid with a long beak, biconvex, black.

Paripode, *KJD 22562*

Fl. & Fr.: July-October

Distribution: Weed along the boundaries near Farm.

ALTERNANTHERA Forssk., Fl. Aegypt.-Arab. 28. 1775.

Alternanthera sessilis (L.) R. Br. ex DC., Cat. Hort. 4: 77. 1813; Manilal & Sivar., Fl. Calicut 245. 1982; Ansari, Fl. Kasaragod Div. 312. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 377. 1988; Joseph, Aquatic Angiosp. Malabar 49. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 670. 2009. *Gomphrena sessilis* L., Sp. Pl. 225. 1753. *Alternanthera triandra* Lam., Encycl. 1: 95. 1785; Gamble, Fl. Pres. Madras 1179(825). 1925.

Decumbent herbs, stem glabrous. Leaves simple, opposite, 3-4 x 1 cm, elliptic-oblong to oblanceolate, apex obtuse, base attenuate into a petiole, crenate, glabrous. Spike 7-12 x 5 mm, sessile, solitary or 2-3 together; bracts and bracteoles similar, 1 mm long, broadly ovate, acute, glabrous. Flowers yellowish red. Tepals equal, 2.5 x 1.5 mm, ovate, acute, glabrous, 3-nerved at base. Stamens 3. Achenes 2 x 2 mm, obovoid, emarginate at apex; seed orbicular, compressed, brown.

Near farm, *KJD 22563*

Fl. & Fr.: Throughout the year

Distribution: Boundaries near Farm as weed.

AMARANTHUS L., Sp. Pl. 989. 1753.

Amaranthus spinosus L., Sp. Pl. 991. 1753; Hook. f., Fl. Brit. India 4: 718. 1885; Gamble, Fl. Pres. Madras 1170(819). 1925; Manilal & Sivar., Fl. Calicut 243. 1982; Ansari, Fl. Kasaragod Div. 313. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 378. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 671. 2009.

Erect glabrous herbs, profusely branched; branches grooved; spines divaricate, sharp, to 1.2 cm long. Leaves simple, 3-8 x 2-4 cm, ovate or elliptic-lanceolate, apex obtuse or subacute, base attenuate; petiole to 4 cm long.

Flowers in terminal paniced spikes or in axillary, sessile clusters; bracts and bracteoles minute, ovate-lanceolate. Male flowers: 1-2 mm across; tepals 5, calycine, unequal, ovate-lanceolate; stamens 5; anthers sagittate. Female flowers: 1-2 mm across; tepals 5, oblong, acute at apex; ovary 1-celled; ovules solitary; stigmas 2-3. Utricle circumcissile; seeds minute, discoid.

Near farm, *KJD 18786*

Fl. & Fr.: June-December

Distribution: Along road side.

CYATHULA Blume, Bijdr. 548. 1826, *nom. cons.*

Cyathula prostrata (L.) Blume, Bijdr. 549. 1826; Hook. f., Fl. Brit. India 4: 722. 1885; Gamble, Fl. Pres. Madras 1172(820). 1925; Manilal & Sivar., Fl. Calicut 243. 1982; Ansari, Fl. Kasaragod Div. 314. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 379. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 672. 2009. *Achyranthes prostrata* L., Sp. Pl. (ed. 2) 296. 1762.

Decumbent herbs. Leaves simple, opposite, 5-7 x 2-3.5 cm, rhomboid, acute at both ends, thinly pubescent; petiole 5-15 mm long. Spike terminal, to 18 cm long, slender, solitary. Flowers in groups of 3-5 of which one perfect and others neuter; bracts and bracteoles similar, 1.5 mm long, lanceolate, acuminate, pubescent. Tepals 5, free, 3 x 1 mm, elliptic, acute, hooked awn like in neuter flowers. Stamens 5, filaments united into a membranous truncate cup; staminodes membranous, alternate with stamens, fimbriate. Ovary ovoid, style simple, stigma capitellate. Achenes 2 x 1 mm, obovoid, compressed, golden brown.

Mullenpara, *KJD 22571*

Fl. & Fr.: September-April

Distribution: Common in Evergreen forests of Chavachi, Mullenpara, Kattikari, Kannadivechakuunu and Pothanplavu.

INDOBANALIA A.N. Henry & B. Roy, Bull. Bot. Surv. India 10: 274. 1969.

Indobanalia thyrsoiflora (Moq.) Henry & Roy, Bull. Bot. Surv. India 10: 274. 1969; Ramach. & V.J. Nair, Fl. Cannanore Dist. 379. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 673. 2009. *Banalia thyrsoiflora* Moq. in DC., Prodr. 13: 278. 1849; Gamble, Fl. Pres. Madras 1167(817).

Erect herbs, stem glabrous, ribbed. Leaves simple, alternate, 7-10 x 3-5 cm, ovate, apex acuminate, base cuneate, hairy below, lateral nerves 8 pairs; petiole 2 cm long. Spikes thyrsoid, panicles, narrow, terminal and axillary; bracts and bracteoles similar, broadly ovate; flowers 2-3 together. Tepals free, equal, 3 x 1 mm, 3-nerved, glabrous. Stamens 5, filaments jointed into a tube. Ovary ellipsoid, compressed, 1-ovuled, style-1, slender; stigmas 2, linear, papillose. Achenes globose; seed orbicular, black.

Ambalappara, *KJD 26302*

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Ambalappara and Pothurumi. Endemic to southern Western Ghats.

POLYGONACEAE

PERSICARIA Miller, Gard. Dict. Abr. Ed. 4. 1754.

- 1a. Scandent herbs; flowers in heads *P. chinensis*
1b. Erect or diffuse herbs; flowers in elongated spikes or racemes 2

- 2a. Erect herbs; ochrea mouth long barbellate*P. barbata*
 2b. Diffuse herbs; ochrea truncate at mouth, glabrous *P. nepalensis*

Persicaria barbata (L.) Hara, Fl. E. Himal. 1: 70. 1966, var. barbata; Joseph, Aquatic Angiosp. Malabar 198. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 676. 2009. *Polygonum barbatum* L., Sp. Pl. 362. 1753; Hook. f., Fl. Brit. India 5: 37. 1886; Gamble, Fl. Pres. Madras 1189(833). 1925; Subram., Indian For. 96: 527. 1970; Manilal & Sivar., Fl. Calicut 247. 1982; Ansari, Fl. Kasaragod Div. 315. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 381. 1988.

Stout herbs, to 1.2 m tall, procumbent below. Leaves simple, subsessile, 7-15 x 1.5-2.5 cm, lanceolate, apex acute or acuminate, base acute to cuneate, glabrous except the margins and midribs; ochrea tubular, 1.5-3 cm long, strigose without, mouth truncate, long barbellate. Spikes terminal, paniculate, 3.5-11cm long; bracts oblong-truncate, ciliate along margins. Perianth white; lobes 5, 2-3 mm long, oblong. Stamens 5. Style-arms 3. Nutlets 3-gonous, included within perianth tube, black on ripening.

Narikkadavu, NS & KJD 25559

Fl. & Fr.: August-March

Distribution: Fairly common along Riversides at Narikkadavu and Pookundu.

Persicaria chinensis (L.) Gross. in Engl., Bot. Jahrb. Syst. 49: 269,277,315. 1913; Sasidh., Fl. Parambikulam WLS 258. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 677. 2009. *Polygonum chinense* L., Sp. Pl. 363. 1753; Hook. f., Fl. Brit. India 5: 44. 1886; Gamble, Fl. Pres. Madras 1190(833). 1925; Ansari, Fl. Kasaragod Div. 315. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 381. 1988.

Scandent subshrubs, branches zig-zag. Leaves simple, opposite, to 10 x 5 cm, broadly ovate or elliptic, shortly acuminate at apex, truncate at base, margins minutely crenulate; petiole to 1 cm, auricled at base; ochrea 2.5 cm long, membranous, truncate. Heads glandular pubescent; peduncles to 5 cm; bracts 3 mm, ovate, acute. Perianth lobes 4 mm, white. Stamens included. Ovary 3-gonous, styles 3. Nutlets 4 mm, trigonous.

Ambalappara, KVB 31788

Fl. & Fr.: Through out the year

Distribution: Common near water bodies in Evergreen forests of Ambalappara, Pothurumi, Chavachi, Kattikari and Kurumbankallu.

Persicaria nepalensis (Meisner) Gross in Engl., Bot. Jahrb. Syst. 49: 277. 1913; Sasidh., Fl. Periyar Tiger Reserve 333. 1998. *Polygonum nepalense* Meisner, Monogr. Polygon. 84. t.7. 1826. *Polygonum alatum* Buch.-Ham. ex Spreng., Syst. Cur. Post. 4:154. 1827; Hook. f., Fl. Brit. India 5: 41. 1886. *Polygonum punctatum* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 72. 1825, non Rafin. 1820; Gamble, Fl. Pres. Madras 1190(833). 1925.

Diffuse herbs, rooting from lower nodes. Leaves simple, deltoid, acute at apex, cuneate at base, sparsely hairy along the nerves below, glandulose; petiole 5-10 mm long; ochrea truncate at mouth, glabrous. Spike on the axils of terminal leaf, sessile, conical; bracts elliptic, acute, glabrous; flowers solitary or paired. Tepals white, 2 mm long, oblong, obtuse, glabrous. Stamens 5. Styles 2, joined below. Nut 1.5 x 1.5 mm, biconvex, apiculate, minutely puberulus, brown.

Fl. & Fr.: October-December

Distribution: Rare in Evergreen forests of Ambalappara.

PODOSTEMACEAE

- 1. Stem thread-like, free floatingIndotristicha
- 1. Thallus crustaceous, adhering to rocks Zeylanidium

INDOTRISTICHA van Royen, Acta Bot. Neerl. 8: 474. 1959.

Indotristicha ramosissima (Wight) van Royen, Acta Bot. Neerl. 8: 474. 1959; Ansari, Fl. Kasaragod Div. 317. 1985; Joseph, Aquatic Angiosp. Malabar 184. 1991; Mathew & Satheesh, Aqua. Bot. 57: 246. 1997; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 680. 2009. *Dalzellia ramosissima* Wight, Ic. t.1920. f.1. 1852. *Terniola ramosissima* (Wight) Willis, Ann. Roy. Bot. Gard. (Peradeniya) 1: 208, 293, 306 tt. 5-9, f.29. 1902. *Tristicha ramosissima* (Wight) Willis, Ann. Roy. Bot. Gard. (Peradeniya) 1: 208. 1902 & 1:293-306. ff. 5-9. 1902; Gamble, Fl. Pres. Madras 1194(836). 1925.

Stem free floating, branched herbs, to 60 cm long, attached to rock by base, stem with 1.5-2.5 cm long ramuli and scale leaves. Flowers 1-6 mm long, axillary along the stem; pedicels 1-2.5 cm long, slender, erect. Perianth 3, free, 2 mm long, ovate. Stamens 3. Ovary 2.5 mm long, ellipsoid, stigma 3-lobed.

Kariyenkappu, KJD 31492

Fl. & Fr.: November-March

Distribution: Wet Rocks near Rivers in at Kariyenkappu to Valayamchal. Endemic to southern Western Ghats.

ZEYLANIDIUM (Tul.) Engl., in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 18a : 61. 1930.

Zeylanidium olivaceum (Gard.) Engl. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 18a: 62. 1930; Nagendran & Arekal, Bull. Bot. Surv. India 23: 231. 1981; Joseph, Aquatic Angiosp. Malabar 195. 1991; Mathew & Satheesh, Aqua. Bot. 57: 271. 1997. *Podostemum olivaceum* Gard., Calcutta J. Nat. Hist. 7: 181. 1847; Hook. f., Fl. Brit. India 5: 66. 1886. *Hydrobryum olivaceum* (Gard.) Tul., Ann. Sci. Nat. Bot. ser. 3, 11: 104. 1849; Gamble, Fl. Pres. Madras 1198(839). 1925.

Thallus crustaceous, adhering to rocks, secondary sterile shoots and flowering shoots arise from thallus, sterile shoots 6 cm long, tubular. Leaves clustered at apex, hair-like, 5 cm long. Flowering shoots to 5-7 mm; pedicels to 2.5 mm; bracts 6-8; spathella to 3 mm long, splitting longitudinally. Tepals 2 mm. Stamens 2, monadelphous, 3 mm. Ovary 2 mm, ovoid; stigma 2-fid, lobes unequal, margins serrate. Capsule 2 mm long, ribbed; seeds many.

Meenmutty, KJD 31495

Fl. & Fr.: November-December

Distribution: On wet rocks along River sides at Meenmutty.

ARISTOLOCHIACEAE

- 1a. Erect shrubs; capsule cylindrical..... Thottea
- 1b. Climbers; capsule globose Aristolochia

ARISTOLOCHIA L., Sp. Pl. 960. 1753.

- 1a. Leaves deeply cordate at base..... *A. acuminata*
1b. Leaves rounded..... *A. indica*

Aristolochia acuminata Lam., Encycl. 1: 254. 1783; Bosser, Adansonia ser. 3, 19: 170. 1997. *Aristolochia tagala* Cham., Linnaea 7: 207. t. 5. f. 3. 1832; Gamble, Fl. Pres. Madras 1202(841). 1925; Ansari, Fl. Kasaragod Div. 319. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 384. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 682. 2009. *Aristolochia roxburghiana* Klotzsch, Monatsb. Akad. Berlin 596. 1859; Hook. f., Fl. Brit. India 5: 75. 1886.

Twining, stem glabrous. Leaves simple, alternate, 13-18 x 8-10 cm, ovate, apex acuminate, deeply cordate, base 5-7 ribbed, glabrous; petiole 4-5 cm long. Flowers 6.5 cm long, in axillary raceme; bracts 5 mm long, ovate. Perianth tube 1 cm long, hairy inside, glabrous outside; limb 4.5 cm long, 1 cm broad, brown, tomentose. Stamens 12, biseriate; connective broad; anthers oblong. Ovary 6-celled; ovules numerous; style 6-7-fid, short. Capsule obovoid, transversely rugose, stalked, 6-celled; seeds deltoid.

Poathanplavu, NS & KVB 31398

Fl. & Fr.: January-June

Distribution: Fairly common in Semi-evergreen forests of Poathanplavu and Evergreen forests of Chavachi and Crossway.

Aristolochia indica L., Sp. Pl. 960. 1753; Hook. f., Fl. Brit. India 5: 75. 1886; Gamble, Fl. Pres. Madras 1202(841). 1925; Manilal & Sivar., Fl. Calicut 248. 1982; Ansari, Fl. Kasaragod Div. 318. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 383. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 682. 2009. *Aristolochia lanceolata* Wight, Ic. t. 1858. 1852.

Twining perennial herbs; branchlets slender. Leaves simple, alternate, 3.5-8 x 2-3.5 cm, ovate-lanceolate or ovate-oblong, base truncate, apex acute to acuminate, glabrous; 3-5-nerved at base; petiole to 2.5 cm long. Flowers in few-flowered axillary racemes; pedicels c. 7 mm long, elongate in fruits. Bracts c. 1.5 mm long, lanceolate. Perianth tube dull brown, 1-1.5 cm long, bulbous base 3-5 mm across, green; limb 2-2.5 cm long, linear-oblong, rounded at apex, greyish-green. Stamens 6. Ovary c. 2 mm long; stigmas 6, fleshy. Capsule 1.5-3 x 1.5-2 cm, globose-pyriform, 6-ridged, dehiscent from the base, after dehiscence parachute-like; seeds 4-6 mm across, broadly deltoid, flat, winged.

Paripode, KJD 18736

Fl. & Fr.: July-March

Distribution: Rare in Semi-evergreen forests of Paripode.

THOTTEA Rottb., in Nye, Dansk. Vidensk. Selsk. Skrift. 2: 529, t. 2. 1783.

Thottea siliquosa (Lam.) Ding Hou, Blumea 27: 327. 1981; Ansari, Fl. Kasaragod Div. 319. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 384. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 683. 2009. *Apama siliquosa* Lam., Encycl. 1: 91. 1783; Gamble, Fl. Pres. Madras 1200(840). 1925. *Bragantia wallichii* R. Br. ex Wight & Arn., Edinb. New Phil. J. 15: 181. 1833; Hook. f., Fl. Brit. India 5: 73. 1886.

Shrubs, branchlets angled. Leaves simple, alternate, 19-25 x 5-8 cm, elliptic-oblong, inequilateral, apex acuminate, tomentose below; nerves 5-8 pairs, basal pair rib-like, extending above the middle, nervules parallel; petiole

5 mm long. Flowers in axillary fascicles, 1-5 together, 1.5 cm across; perianth lobed, united into a cup, acute, purplish-brown lined inside. Stamens 12, united in 3 groups. Ovary 4-celled; ovules numerous, 2-seriate; stigma peltate, many-lobed. Capsule to 12 cm x 5 mm, cylindrical, torulose; seeds 2 mm long, trigonous, rugose.

Paripode, KVB 31281

Fl. & Fr.: Throughout the year

Distribution: Common in Semi-evergreen forests of Paripode, Kattikari, Chavachi and Pothanplavu.

PIPERACEAE

- 1a. Climbing shrubs; spike leaf opposed, flowers dioecious Piper
1b. Erect subshrubs or herbs; spike terminal or axillary; flowers bisexual..... 2
2a. Subshrubs; leaves alternate, orbicular cordate..... Lepianthes
2b. Herbs; leaves opposite or whorled, not cordate..... Peperomia

LEPIANTHES Rafin., Sylva Tellur. 84. 1838.

Lepianthes umbellata (L.) Rafin., Sylva Tellur. 85. 1838; Ansari, Fl. Kasaragod Div. 320. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 384. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 684. 2009. *Piper umbellatum* L., Sp. Pl. 30. 1753. *Hackeria subpeltata* (Willd.) Kunth, Linnaea 13: 571. 1839; Gamble, Fl. Pres. Madras 1208(846). 1925. *Piper subpeltatum* Willd., Sp. Pl. 1: 166. 1797; Hook. f., Fl. Brit. India 5: 95. 1886. *Pothomorphe subpeltata* (Willd.) Miq., Comm. Phyt. 37. 1840.

Erect shrubs, to 1.5 m high; stems ridged. Leaves simple, alternate, 20-40 x 20-40, orbicular, rounded at apex, cordate at base, entire, pubescent above and below; nerves palmately radiating from base; petiole sheathing at base, to 20 cm long. Spikes 8-15 x 0.3 cm, cylindric, 3-7 together, umbellate, peduncled, axillary, bracts peltate, stalked, triangular, ciliate. Flowers densely packed; stamens 3, filaments short; ovary obovoid, truncate, stigmas 3, sessile, curved out. Berry trigonous, minute.

Moonamthode, KJD 31845

Fl. & Fr.: June-February

Distribution: Common in the Evergreen and Semi-evergreen forests of Moonamthode, Crossway, Chavachi, Kattikari and Meenmutty.

PEPEROMIA Ruiz. & Pav., Prodr. 8. 1794.

- 1a. Terrestrial herbs, occasionally epiphyte; leaves cordiform..... *P. pellucida*
1b. Epiphytic herbs; leaves obovate *P. tetraphylla*

Peperomia pellucida (L.) Kunth, Nov. Gen. Sp. 1: 64. 1815; Gamble, Fl. Pres. Madras 1210(847). 1925; Manilal & Sivar., Fl. Calicut 248. 1982; Ansari, Fl. Kasaragod Div. 320. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 386. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 685. 2009. *Piper pellucidum* L., Sp. Pl. 30.1753. *Peperomia exigua* (Blume) Miq., Syst. Piperac. 77. 1843; Hook. f., Fl. Brit. India 5: 97. 1886.

Delicate, glabrous annual herbs; stems erect, 5-30 cm tall, pellucid, branched when well developed. Leaves simple, alternate throughout, 1-3 cm long and wide, triangular ovate, cordate at base with a sinus 1-2 mm deep, obtuse or shortly acuminate at apex, pellucid, palmately 5-7 nerved from the base; petiole 6-15 mm long, clasping decurrent along the stem. Spikes solitary, terminal but frequently leaf-opposed by overtopping, 2-5 cm long, slender, axis glabrous; peduncle 2-5 cm

long, about as thick as spike axis; bracts 0.2-0.3 mm in diameter. Flowers scarcely immersed. Ovary with a fleshy, oblique, subapical stigma. Fruit sessile, about 0.8 mm long, globose-ellipsoid, with an apical stigma, longitudinally striate-undulate, blackish brown at maturity.

Narikkadavu, NS & KJD 25544

Fl. & Fr.: July-December

Distribution: Fairly common in Semi-evergreen forests of Narikkadavu and Evergreen forests of Chavachi and Pothanplavu.

Peperomia tetraphylla (G.Forst.) Hook. & Arn., Bot. Beech Voy. 97. 1841; Ramach. & V.J. Nair, Fl. Cannanore Dist. 386. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 686. 2009. *Piper tetraphylla* G.Forst., Prod. 5. 1759. *Peperomia reflexa* (L. f.) Dietr., Sp. Pl. 1:180.1839, non HB.K. 1815; Hook. f., Fl. Brit. India 5:99.1886; Gamble, Fl. Pres. Madras 1209(847). 1925.

Epiphytic herbs; branches diffuse to procumbent; stem and leaves thinly pubescent. Leaves simple, whorled, 3-4 at each node, 7-10 x 5-7 mm, orbicular, obtuse. Spike 1.5 cm long, erect, stout; peduncle 0.8 cm long; bracts peltate, sessile, with white margins. Flowers densely arranged; stamens 2; stigmas 3-toothed. Nutlets 0.8 x 0.4 mm, ovoid, beaked, brown, glabrous.

Kattikkari, KVB 31560

Fl. & Fr.: July-December

Distribution: Rare in Evergreen forests of Kattikkari.

PIPER L., Sp. Pl. 28. 1753.

- 1a. Spikes erect 2
- 1b. Spikes pendulous..... 3
- 2a. Leaves cordate at base, female spike more than 2 cm long *P. longum*
- 2b. Leaves acute at base, female spikes 1 cm long *P. mullesua*
- 3a. Branchelets and leaves pubescent *P. hymenophyllum*
- 3b. Branchelets and leaves glabrous 4
- 4a. Spikes more than 15 cm..... *P. argyrophyllum*
- 4b. Spikes less than 12 cm 5
- 5a. Bracts cupular *P. nigrum*
- 5b. Bracts curved and hooded at one side *P. wightii*

Piper argyrophyllum Miq., Syst. Piperac. 330.1844; Hook. f., Fl. Brit. India 5:93.1886; Gamble, Fl. Pres. Madras 1207(845). 1925; Anil Kumar et al., Fl. Pathanamthitta 418. 2005.

Climbing shrubs. Leaves simple, alternate, 8-13 x 5-6 cm, ovate or elliptic, acuminate at apex, acute or rounded at base, oblique, lower side usually covered with white scales, glabrous, basely 7 nerved; petiole 1 cm long; stipule to 1.5 cm long, lanceolate. Spikes slender, leaf-opposed, drooping; peduncle 2-3 cm long; bracts oblong, adnate to the rachis with free margins, ciliate; stamens 2. Berry 3 x 3 mm, globose, stigma 4, curved.

Asthipara, KJD 26080

Fl. & Fr.: July-February

Distribution: Fairly common at Asthipara, Mullaenpara, Kattikari, Pookundu, Paripode and Chavachi.

Piper hymenophyllum Miq. in Hook.'s London J. Bot. 5: 554. 1846; Hook. f., Fl. Brit. India 5: 93. 1886; Gamble, Fl. Pres. Madras 1207(845). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 387. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 687. 2009.

Slender climbers. Leaves simple, alternate, to 13 x 6 cm, ovate, acuminate at apex, rounded to subcordate at base, often unequal sided, 7-ribbed, membranous; petiole 1 cm long. Spike to 20 cm long, slender, drooping; male spike shorter; bracts oblong, adnate to the rachis with free margins, hairy; stamens 2 or 3; stigma 3-lobed. Berry 5 mm long, ovoid, beaked.

Kattikkari State Boundary, *KJD 18718*

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests of Kattikkari. Endemic to Peninsular India.

Piper longum L., Sp. Pl. 29. 1753; Hook. f., Fl. Brit. India 5: 83. 1886; Gamble, Fl. Pres. Madras 1205(844). 1925; Manilal & Sivar., Fl. Calicut 248. 1982; Ansari, Fl. Kasaragod Div. 321. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 387. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 688. 2009. *Chavica roxburghii* Miq., Syst. Piperac. 239. 1843.

Scandent or straggling shrubs, sometimes ascending and climbing. Leaves simple, alternate, 8 x 4 cm, ovate, acute at apex, cordate and strongly oblique at base, 7-nerved, membranous, shining above; nerves impressed; petiole 1-3 cm long. Female spike stout, erect; peduncle 1.5 cm long; bracts peltate, orbicular. Male spike to 7 cm long, erect, slender; stamens 2. Berry 2 mm across, glabrous, black or deep red.

Narikkadavu, *KJD 26283*

Fl. & Fr.: August-January

Distribution: Common in Semi-evergreen forests of Paripode, Narikkadavu and Pookundu.

Piper mullesua Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 20. 1825; Ramach. & V.J. Nair, Fl. Cannanore Dist. 388. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 688. 2009. *Piper brachystachyum* Wall. ex Hook. f., Fl. Brit. India 5: 87. 1886; Gamble, Fl. Pres. Madras 1206(844). 1925; Manilal, Fl. Silent Valley 231. 1988.

Slender climbers; branches often clustered. Leaves simple, alternate, to 9 x 4 cm, elliptic, acuminate at apex, acute at base, 3-5 ribbed from base, secondary nerves prominent, glabrous. Female spike to 7 x 4 mm, erect, oblong; peduncle 3 mm long; male spike to 4 cm long, erect, slender; bracts peltate, orbicular; stamens 3; stigmas 3, spreading. Berry 1.5 mm across, red.

Ambalappara, *KVB 31722*

Fl. & Fr.; December-April

Distribution: Common in Plantations of Kariyenkappu and Evergreen forests of Chavachi, Chelachode, Moonamthode, Kattikari, Pothurumi and Ambalappara.

Piper nigrum L., Sp. Pl. 28. 1753, var. *nigrum*; Hook. f., Fl. Brit. India 5: 90. 1886; Gamble, Fl. Pres. Madras 1206(845). 1925; Manilal & Sivar., Fl. Calicut 248. 1982; Ansari, Fl. Kasaragod Div. 321. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 388. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 688. 2009.

Glabrous climbers. Leaves simple, alternate, to 16 x 10 cm, ovate, acuminate at apex, acute, rounded or truncate at base, 7-nerved, nervules subparallel; petiole to 2.5 cm long. Spikes to 12 cm long, slender; peduncles to 2.5 cm long; bracts united forming a cup below the flower. Flowers closely

placed; stamens 2. Drupes 5 mm across, globose, smooth, deep red; stigmas 3-5, recurved.

Kariyenkappu, *KJD 26264*

Fl. & Fr.: July-March

Distribution: Cultivated in settlements and also run wild.

Piper wightii Miq. in Hook.'s London J. Bot. 5: 552. 1846; Hook. f., Fl. Brit. India 5: 94. 1886; Gamble, Fl. Pres. Madras 1207(845). 1925; Mohanan & Sivad., Fl. Agasthyamala 556. 2002.

Stout glabrous climbers. Leaves simple, alternate, 14-17 x 6-8 cm, ovate, acuminate at apex, round to subcordate at base, 3-5-ribbed, coriaceous, midrib with 2-3 lateral nerves similar to ribs, nervules reticulate; petiole 2 cm long. Spike to 8 cm long stout, drooping; peduncle 2 cm long; bracts curved and hooded at one side. Flowers distantly arranged; stamens 2. Berry reddish, to 7 mm across, globose, smooth; stigmatic lobes 3 or 4.

Ambalappara, *KVB 31746*

Fl. & Fr.: July-February

Distribution: Common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

MYRISTICACEAE

1a. Staminal column peltate, anthers stellately spreading..... Knema

1b. Staminal column not peltate, anthers not as above Myristica

KNEMA Lour., Fl. Cochinch. 604. 1790.

Knema attenuata (Hook. f. & Thoms.) Warb., Monogr. Myris. 590. 1897; Gamble, Fl. Pres. Madras 1215(851). 1925; Ansari, Fl. Kasaragod Div. 322. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 390. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 691. 2009. *Myristica attenuata* Wall. ex Hook. f. & Thoms., Fl. Ind. 157. 1855; Hook. f., Fl. Brit. India 5: 110. 1886. *Myristica corticosa* Bedd., Fl. Sylv. t. 278. 1872.

Deciduous trees, to 18 m high, bark 6-8 mm thick, surface greenish-black to greenish-brown, mottled with green and white, smooth, exfoliations irregular; exudation watery, red; branchlets horizontal; branchlets rusty tomentose. Leaves simple, alternate, distichous, 8-20 x 2.5-7.5 cm, oblong-lanceolate, oblong or ovate, apex acuminate, base round, or acute, margin entire, glabrous, glossy above and glaucous beneath or rusty pubescent along costae beneath, coriaceous; petiole 1-1.5 cm long, stout, grooved above, rusty pubescent when young and glabrous when mature; lateral nerves 12-16 pairs, parallel, slender, prominent beneath, intercostae scalariform, slender, prominent. Flowers unisexual, in rusty pubescent fascicles on thick peduncle from the axils of leaves or of the scars of fallen leaves; male 1-6 flowered, female 1-3 flowered; pedicel 7-8 mm long; perianth larger in female, rusty tomentose; lobes 3-[4]; androecium usually stalked; filaments and connectives connate in a peltate disc; anthers 8-20, free, attached stellately to the margin of the disc, dehiscing downwards. Ovary superior, ovoid, 1-celled, hairy, ovule-1; style short, thick, hairy; stigma 2, lacinate on the margin. Fruit a capsule 2-valved, 3-3.7 cm long, ovoid, apiculate, rusty tomentose; seed one; aril brilliant crimson, lacinate at apex only.

Crossroad, *KVB 31276*

Fl. & Fr.: February-April

Distribution: Common in Evergreen and Semi-evergreen forests at Crossway, Meenmutty and Pothanplavu.

MYRISTICA Gronov., Fl. Orient. 141. 1755, *nom.cons.*

1a. Flowers fascicled; capsule glabrous *M. malabarica*

1b. Flowers paniced cymes; capsule tomentose..... *M. beddomei*

Myristica beddomei King, Ann. Roy. Bot. Gard. (Calcutta) 3: 291, t. 118. f.1-8, 1891, ssp. *beddomei*: de Wilde, Blumea 42: 151. 1997; Gamble, Fl. Pres. Madras 1214(850). 1915; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 692. 2009. *Myristica dactyloides* auct. non Gaertn. 1788; Sinclair, Gard. Bull. Singapore 23: 445. 1968; Ramach. & V.J. Nair, Fl. Cannanore Dist. 390. 1988; Anil Kumar et al., Fl. Pathanamthitta 421. 2005. *Myristica laurifolia* auct. non Hook. f. & Thoms. 1855; Hook. f., Fl. Brit. India 5: 103. 1886. *Myristica laurifolia* var. *lanceolata* Hook.f., Fl. Brit. India 5: 103. 1886. *Myristica contorta* Warb., Monogr. Myris. 5-7. 1897; Gamble, Fl. Pres. Madras 1214(850). 1925.

Evergreen dioecious trees, to 25 m high, bark 10-14 mm thick, surface blackish-green, smooth, exfoliations small, exudation watery, red; branchlets glabrous except for terminal bud and inflorescence. Leaves simple, alternate, distichous, 12-25 x 4-10 cm, oblong or elliptic-ovate, apex acute, base acute, round or rarely cuneate, margin entire, glabrous, shining above and glaucous beneath, coriaceous; lateral nerves 10-25 pairs, pinnate, prominent, intercostae reticulate, faint; petiole 1-2.5 cm long, grooved above, glabrous. Flowers unisexual, white; male flowers 10-20 together in short axillary dense clusters; peduncle prominently marked with cicatrices of the bracts; pedicels slender, ferruginous tomentose. Perianth thin, fleshy, rusty tomentose, connate into an urceolate tube, constricted above, suddenly expanded, breaking into 3 ovate, spreading acute lobes. Staminal column narrow to oblong, ferruginous, included, produced beyond the anther; anthers 7-15, linear-oblong. Female flowers as in male, generally 3-4 in the heads; ovary superior, sessile, ovoid-globose, appressed pubescent, 1-celled, ovule 1; stigma oblique, 2-lobed. Fruit a capsule, 5-7.5 x 3.7-6 cm, ovoid, apiculate, grooved on one side along the suture, pericarp rufous pubescent when young, thick, succulent; seed one, ovoid; aril orange red, encircling the seed, deeply cut down into many lobes, each lanceolate at the apex into filiform segments.

Kariyenkappu, KVB 31216; Meenmutty, KVB 31277;
Chelachode, KVB 31295

Fl. & Fr.: November-May

Distribution: Common in the Evergreen of Meenmutty, Chelachode, Moonamthode, Kannadivechakunnu and Chavachi; Semi-evergreen forests of Kariyenkappu, Pothanplavu, Paripode and 55 Block.

Myristica malabarica Lam., Acad. Roy. Sci. Mem. Math. Phys. (Paris) 162. 1791; Hook. f., Fl. Brit. India 5: 103. 1886; Gamble, Fl. Pres. Madras 1213(850). 1925; Manilal & Sivar., Fl. Calicut 249. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 692. 2009.

Dioecious trees, height to 20 m tall; bark 8-10 mm thick, greenish-black, smooth, tuberculate-lenticellate; exudation deep red; branchlets glabrous. Leaves simple, alternate, distichous, 7-20 x 3-10 cm, elliptic or elliptic-oblong, apex acute, base acute or attenuate, or subacute, margin entire, glabrous and glossy above and glaucous beneath, coriaceous; lateral nerves 8-14 pairs,

pinnate, slender; petiole 10-15 mm long, stout, grooved above, glabrous. Flowers unisexual, white; male in cymes, axillary or from the old axils below the leaves, generally cymosely branched, rarely simple. Male flowers: more numerous than in female and smaller, umbelled at the apex of branchlets; perianth urceolate, minutely puberulous outside, glabrous inside, 3-4 cleft at apex; staminal column stalked, slightly produces above the anthers, pubescent; anthers 10-15, linear. Female flowers: slightly larger than male peduncle generally simple with 3 umbelled pedicels at the apex, rarely once branched and bearing 5-6 flowers; bracteole forming a narrow linear cup round the base of the perianth; ovary superior, sessile, globose, hairy, stigma 2 clefted, glabrous. Fruit a capsule 5-7.5 x 1.8-3.5, oblong, pubescent, seed one, oblong, obtuse, slightly flattened on one side, aril yellow, irregularly lobed, laciniate, extending to the apex of the seed.

Pothurumi, KVB 31655; Paripode, KVB 31678

Fl. & Fr.: January-September

Distribution: Rare in Semi-evergreen forests of Paripode and Evergreen forests of Chavachi and Pothurumi. Endemic to Western Ghats; Conservation status: Vulnerable.

LAURACEAE

- 1a. Leaves opposite or subopposite..... Cinnamomum
- 1b. Leaves alternate or verticillate 2
- 2a. Anthers 2-celled 3
- 2b. Anthers 4-celled..... 4
- 3a. Fruit not covered by perianth tube..... Beilschmiedia
- 3b. Fruit covered by perianth tube Cryptocarya
- 4a. Flowers bisexual 5
- 4b. Flowers dioecious..... 6
- 5a. Fruit supported by basal erect perianth lobe Phoebe
- 5b. Only basal rim of perianth lobe persistent in fruit Persea
- 6a. Fertile stamens 6 Neolitsea
- 6b. Fertile stamens 9-12 7
- 7a. Involucral bracts deciduous..... Actinodaphne
- 7b. Involucral bracts persistent in flowers Litsea

ACTINODAPHNE Nees. in Wall., Pl. Asiat. Rar. 2: 68. 1831.

- 1a. Leaves 7-25 cm long, densely hairy below *A. malabarica*
- 1b. Leaves less than 10 cm long, not hairy. *A. salicina*

Actinodaphne malabarica Balakr., Journ. Bombay Nat. Hist. Soc. 63: 329. 1967; Ramach. & V.J. Nair, Fl. Cannanore Dist. 392. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 694. 2009. *Actinodaphne hirsuta* Hook. f., Fl. Brit. India 5: 152. 1886, non Blume 1851; Gamble, Fl. Pres. Madras 1231(862). 1925.

Trees, to 18 m high, bark dark grey, smooth, lenticellate; young shoots densely fulvous tomentose. Leaves simple, subverticillate, opposite or subopposite, 7-25 x 2.5-6 cm, elliptic or elliptic-lanceolate, apex acuminate, base acute or attenuate, margin entire, glabrous above, villous beneath, chartaceous; lateral nerves 8-12 pairs, pinnate, slender, prominent, intercostae scalariform, obscure; petiole 7-20 mm long, stout, tomentose. Flowers unisexual, yellowish. Male flowers: in densely tomentose racemes of 2.5 cm long; bracts 10 x 7 mm, orbicular, densely silky brown tomentose;

tepals 6, subequal, oblong, obtuse, silky brown tomentose; stamens 9, in 3 rows; filaments 2-glandular, densely hispid; anthers 4-celled, oblong, introrse. Female flowers: staminodes 9, in 3 rows, those of row 3 with 2-glands; ovary half inferior, ovoid, attenuate into the style; stigma dilated. Fruit a berry 7-10 mm across, globose, seated in a perianth cup, red.

Kattikari, NS & KVB 31335

Fl. & Fr.: August-January

Distribution: Fairly common in Evergreen forests of Kattikari and Moonamthode. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Actinodaphne salicina Meisner in DC., Prodr. 15: 212. 1864; Hook. f., Fl. Brit. India 5: 148. 1886; Gamble, Fl. Pres. Madras 1230(861). 1925; Mohanan & Sivad., Fl. Agasthyamala 563. 2002.

Small trees or large shrubs; branchlets slender, glabrous. Leaves simple, subverticillate, 8.5 x 2.5 cm, narrowly elliptic or oblanceolate, attenuate at the base, membranous, glaucous beneath; nerves 8-12 pairs, parallel; intercostae, densely and minutely reticulate; petiole to 6 mm long.

Ambalappara, KVB 31582

Fl. & Fr.: September-March

Distribution: Fairly common in Evergreen forests of Ambalappara, Pothurumi and Kattikari. Endemic to southern Western Ghats; Conservation status: Endangered.

BEILSCHMIEDIA Nees in Wall., Pl. Asiat. Rar. 2: 61, 69. 1831.

Beilschmiedia wightii (Nees) Benth. ex Hook. f., Fl. Brit. India 5: 124. 1886; Gamble, Fl. Pres. Madras 1221(855). 1925; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 696. 2009. *Haasia wightii* Nees, Syst. Laurin. 676. 1836.

Trees, to 25 m high, bark 14-16 mm thick, surface brown, smooth, branchlets glabrous. Leaf-buds elongate perulate with lanceolate scales. Leaves simple, alternate and opposite, 7.5-15 x 2-6.2 cm, elliptic, elliptic-ovate, elliptic-oblong or elliptic-lanceolate, apex obtusely acuminate, base acute or alternate, margin entire, glabrous, shining, coriaceous; lateral nerves 8-10 pairs, pinnate, prominent, intercostae reticulate; petiole 1-2.5 cm, stout, glabrous. Flowers bisexual, greenish-yellow, in axillary and terminal, glabrous panicles, small, ebracteate; peduncle and pedicel slender; perianth tube short, lobes 6, (3+3) subequal. Stamens 9 perfect, in 3 rows, those of the 2 outer series with eglandular filaments and introrse anthers, those of the third series with 2 glandular filaments and extrorse anthers; staminodes 3, of fourth series cordate or ovoid, stipitate; glands 6, stipitate, as large as staminodes, between the second and third row of stamens. Ovary half inferior, ovoid, glabrous; style slender, stigma subcapitate or obtuse. Fruit a berry 17-18 mm long, ovoid, smooth, purple.

Chelachode, NS & KVB 31432

Fl. & Fr.: January-February

Distribution: Rare in Evergreen forests of Chelachode-Chavachi area. Endemic to southern Western Ghats; Conservation status: Endangered

CINNAMOMUM Schaeffer, Bot. Exped. 74. 1760, *nom. cons.*

- 1a. Leaves tomentose or sparsely hairy below 2
1b. Leaves glabrous below 3
2a. Leaf base cuneate, more than 8 cm long *C. nicolsonianum*

- 2b. Leaf base acute, less than 5 cm long..... *C. perrottetii*
- 3a. Leaves linear 4
- 3b. Leaves broad..... 5
- 4a. Leaves more than 15 cm long; trees 12-15 m tall *C. macrocarpum*
- 4b. Leaves less than 10 cm long; and small trees *C. riparium*
- 5a. Leaf base acute; medium trees 20 m or more tall 5
- 5b. Leaf base cuneate, slightly decurrent; trees below 10 m tall *C. wightii*
- 6a. Leaves 10-15 cm long..... *C. verum*
- 6b. Leaves 15-30 cm long..... *C. malabatum*

Cinnamomum malabatum (Burm. f.) Blume, Bijdr. 568. 1826; Ansari, Fl. Kasaragod Div. 324. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 697. 2009. *Laurus malabatum* Burm. f., Fl. Ind. 92. 1768.

Cinnamomum iners sensu Gamble, Fl. Pres. Madras 1224(857). 1925, non Reinw. ex Blume, 1826.

Trees, to 20 m high, bark 5-10 mm thick, reddish-brown, smooth or slightly, longitudinally cracked. Apical bud small, densely, subadpressed pilose. Leaves simple, opposite or subopposite, 10-30 x 3-9 cm, elliptic-oblong, oblong or oblong-lanceolate, apex acute or acuminate, base acute, margin entire, glabrous above, highly aromatic when bruised, coriaceous; 3-ribbed from at or a little above the base, the side ribs running almost to the apex, prominent with sparse crisp fine hairs, intercostae scalariform, glabrescent, slender; petiole 10-20 mm long, stout, glabrous. Flowers bisexual, in axillary and pseudo terminal paniculate cymes upto 25 cm long, with densely minutely subadpressed hairy; pedicels 3-4 mm long, slender, slightly thickened upwards; perianth tube shallow, 1 mm broad. Tepals 6, 3-3.5 mm long, fleshy, ovate, acute, with dense subadpressed pilose hairs. Stamens 9 perfect, in 3 rows, 2-2.5 mm long, those of first and second row opposite the perianth lobes, introrse and eglandular, those of the third row opposite the first row, extrorse, bearing large glands on short stipes, the basal part of which adnate to the filaments; filaments pilose, slender, slightly longer than the anthers; anthers oblong to subovate-oblong, 4-celled; staminodes of fourth row 1.5 mm long, hastate, cordate, on as long stipes, opposite the second row. Ovary half inferior, 2 mm, ellipsoid; style thick, cylindrical; stigma small, peltate. Fruit a berry, to 8 x 10 mm, subtended by shallow fleshy cup; the rim with the persistent thickened, basal part of tepals rounded, pilose.

Meenmutty Road, KVB 31512

Fl. & Fr.: March-April

Distribution: Common in all areas except Kattikari-Ambalappara-Pothurumi region. Endemic to southern Western Ghats.

Cinnamomum nicolsonianum Manilal & Shylaja, Bull. Bot. Surv. India 28: 111. 1986.

Trees, 15 m high. Leaves simple, opposite, 9-20 x 4-6 cm, elliptic, apex obtuse, base cuneate, margin entire, sparsely hairy above, moderately hairy beneath, chartaceous, 3-ribbed from base, reaching the tip, intercostae scalariform, prominent. Flowers bisexual, 15-30, in axillary panicles, 10 cm long; pedicels short. Perianth tube short, tepals 6, 2-3 mm long, tomentose. Stamens 9 perfect, those of first and second rows opposite the perianth lobes, introrse and eglandular, those of third row opposite the first row, lateral, bearing 2 large glands at the base; staminodes 3, of the fourth row opposite the second row, cordate and stipitate. Ovary half inferior, sessile. Fruit a berry, up

to 8 x 10 mm, subtended by shallow fleshy deep cup, the base conical; the rim with the persistent, thickened tepals, basal part rounded, pilose.

Kattikari, State Boundary, *KJD 26119*

Fl. & Fr. February-July

Distribution Rare in Evergreen forests of Kattikari. Endemic to southern Western Ghats.

Note: Earlier reported from plains and foot hills of Silentvalley. The present collection is the second locality at elevation of 1000 m.

Cinnamomum macrocarpum Hook. f., Fl. Brit. India 5: 133. 1886; Gamble, Fl. Pres. Madras 1225(857). 1925; Mohanan, Fl. Quilon Dist. 344. 1984; Vajr., Fl. Palghat Dist. 402. 1990; M. Mohanan & Henry, Fl. Thiruvanthapuram 392. 1994; Subram., Fl. Thenmala Div. 312. 1995; Sasidh., Fl. Periyar Tiger Reserve 344. 1998; Ravikumar & Ved, Illustr. Field Guide 100 Red Listed Med. Pl. 87. 2000 Mohanan & Sivad., Fl. Agasthyamala 566. 2002.

Trees, 12-15 m high; branches terete, blackish-brown; branchlets puberulous, smooth, gradually compressed and quadrangular, leaf-bearing branchlets slender, compressed, densely brown puberulous, 1.5-2.0 mm thick. Leaves simple, subopposite, 15-22 x 2.8-4.0 cm, narrow oblong-lanceolate to oblong-elliptic, apex ending to broad acumen, subequally acute at base, slightly decurrent to extreme base, thinly coriaceous; lateral nerves of the central one sub-prominent and distant, that of accessories forming faint loops along margin; tertiary nerves parallel, 1-2 mm apart, faint above, obscure beneath; intercostae faintly reticulate above, obscure beneath; petioles 1-1.5 cm long, puberulous. Infructescences solitary, axillary, c. 15 cm long; peduncles ca 5.5 cm long, terete, puberulous; rachis flattened, densely puberulous. Fruits green with large oblong, perianth c 22 x 16 mm, obtuse and projected at apex, pericarp blackish, glabrous, muriculate; fruit cup thick, c 3 x 12-15, margin slightly undulate.

Paripode, *KVB 31267*

Fl. & Fr.: May-September

Distribution: Fairly common in Semi-evergreen forests of Pothanplavu to Meenmutty and Paripode. Endemic to southern Western Ghats.

Cinnamomum perrottetii Meisner in DC., Prodr. 15: 504. 1864; Hook. f., Fl. Brit. India 5: 134. 1886; Gamble, Fl. Pres. Madras 1225(857). 1925; Sasidh., Fl. Periyar Tiger Reserve 345. 1998.

Trees, to 8 m high, bark 10 mm thick, smooth, brown, tasteless and odourless; branchlets stiff densely minutely tomentose. Apical bud small, tomentose. Leaves simple, opposite or subopposite, 3.5-6 x 2.5-4 cm, ovate or ovate-elliptic, apex obtuse or acute, base acute, subtruncate or round, margin entire, coriaceous, tomentose on both sides when young, glabrous above, subglaucous and minutely tomentellous beneath; 3-5-ribbed from near the base, prominent, side ribs reaching near the leaf tip; intercostae scalariform, faint; petiole 10-15 mm long, stout, grooved above, tomentose. Flowers bisexual, large, up to 7 mm long, in axillary, few-flowered, minutely tomentose 2-10 cm long panicles; pedicels 2-3 m long, thick. Perianth tube 1.5-2 mm long, funnel-shaped; tepals 6, 5 mm long, oblong-ovate, fleshy, densely appressed pilose inside. Stamens 9 perfect, those of first and second row opposite the perianth lobes, introrse and eglandular, those of third row opposite the first row, extrorse, bearing 2 large glands attached to the middle

of the filament; staminodes of the fourth row opposite the second row, 1.5 mm long, narrowly sagittate, pilose. Ovary half inferior, ellipsoid, as long as style; stigma small, peltate. Fruit a berry, ellipsoid, subtended by densely woolly tepals, base of cup fleshy, obconical.

Ambalappara, *KJD 18770*

Fl. & Fr.: February-May

Distribution: Fairly common in Evergreen forests of Ambalappara and Pothurumi. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Cinnamomum riparium Gamble, Bull. Misc. Inform. Kew 1925. 128. 1925 & Gamble, Fl. Pres. Madras 1224(856). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 393. 1988; Ramach. et al., Journ. Econ. Tax. Bot. 1: 94. 1980; Mohanan & Sivad., Fl. Agasthyamala 567. 2002.

Small trees. Leaves opposite to subopposite, 7-11 x 1.5-3.5 cm, acuminate at apex, broadly attenuate at base, 3-ribbed, c. 0.5 cm above from base. Panicles few-flowered, lax; peduncles 3-4 cm long; pedicels slender, 0.8-1 cm long. Flowers 0.3-0.35 cm across. Perianth lobes 6, c. 1 mm long. Stamens in 3 rows; first and second introrse, 3rd extrorse, glands attached to middle of filaments. Ovary ellipsoid; stigma peltate.

Valayamchal, *KJD 31475*

Fl. & Fr.: January-March

Distribution: River banks of Valayamchal. Endemic to southern Western Ghats; Conservation status: Vulnerable.

Cinnamomum verum Presl, Prir. Rostl. 2: 36. t. 7. 1825; Manilal & Sivar., Fl. Calicut 250. 1982; Ansari, Fl. Kasaragod Div. 324. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 393. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 697. 2009. *Cinnamomum zeylanicum* Blume, Bijdr. 568. 1826; Hook. f., Fl. Brit. India 5: 131. 1886; Gamble, Fl. Pres. Madras 1224(857). 1925.

Trees, to 20 m high, bark 8-10 mm thick, brown, rough, cracks vertical; branchlets glabrous. Leaves simple, opposite or subopposite, 9.5-14 x 3.5-5.5 cm, ovate, elliptic ovate or elliptic-lanceolate, apex acute to acuminate, base acute, margin entire, glabrous, coriaceous, 3-ribbed from base, prominent, glabrous; lateral nerves 3-6 pairs, obscure, pinnate, intercostae reticulate; petiole 8-20 mm, stout, glabrous, slightly grooved above. Flowers bisexual, in terminal and axillary, pedicel 7 mm long, pale yellow, 5 mm long, 6 mm across; perianth 8 mm, silky, tube campanulate, lobes 6, 3 mm long, oblong-lanceolate. Stamens 9 perfect, those of first and second rows opposite the perianth lobes, introrse and eglandular, those of third row opposite the first row, lateral, bearing 2 large glands at the base; staminodes 3, of the fourth row opposite the second row, cordate and stipitate. Ovary half inferior, sessile. Fruit a berry, 1-2 cm, ellipsoid to oblong-ovoid, dark purple, surrounded by the enlarged perianth.

Chavachi, *KJD 18771*

Fl. & Fr.: March-April

Distribution: Stream sides of Chavachi.

Cinnamomum wightii Meisner in DC., Prodr. 15: 11. 1864; Hook. f., Fl. Brit. India 5: 132. 1886; Gamble, Fl. Pres. Madras 1224(857). 1925; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 698. 2009.

Trees, to 8 m high, bark 5-10 mm, grey, smooth, thin, pustular, without aromatic smell; branchlets stiff, smooth, glabrous. Apical bud small, densely minutely sericeous. Leaves simple, opposite or spirally arranged, 3.5-20 x 2.5-7.5 cm, elliptic, ovate, elliptic-ovate or elliptic-oblong, apex obtusely acute or obtusely shortly acuminate, base cuneate, slightly decurrent, margin entire, glabrous, glossy above, pale, subglaucous, smooth or obscurely, minutely pitted beneath, coriaceous; 3-5 or sometimes 7-ribbed from at or a little above the base, very slender, slightly prominulous, the side ribs reaching half to two third the lamina length, becomes obscure; intercostae scalariform, very faint; petiole 10-20 mm long, stout, flattened above. Flowers bisexual, 5-6 mm long, densely fulvous-sericeous, in axillary and pseudo-terminal, short and compact but long peduncled panicle of 10-14 cm long; peduncle stout; branchlets few up to 1 cm, densely, minutely adpressed fulvous pilose; pedicel 5 mm long, thick, obconic. Perianth tube 1 m long, funnel shaped; tepals 6, 3-5 mm long, thick, ovate to oblong-ovate, acute. Stamens 9 perfect, in 3 rows, upto 2 mm long, those of first and second row opposite the perianth lobes, introrse and eglandular, those of third row opposite the first row, extrorse bearing large stipitate glands as long as filaments; filaments pilose, anthers 4-celled, broadly ovate; staminodes of fourth row opposite the second row, narrowly sagittate, pilose, stipitate, almost as long as the stamens. Ovary ellipsoid, half-inferior; style as long with minute, peltate stigma. Fruit a berry, upto 1 x 1.5 cm, ellipsoid, subtended by fleshy obconical pedicel, margin 1 cm across bearing 0.5 mm long basal remnants of the tepals.

Ambalappara, *KJD 22576*

Fl. & Fr.: April-June

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthippara. Endemic to southern Western Ghats.

CRYPTOCARYA R. Br., Prodr. Fl. Nov. Holland. 1: 402. 1810.

Cryptocarya beddomei Gamble, Bull. Misc. Inform. Kew 1925: 127. 1925 & Fl. Pres. Madras 1218(853). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 394. 1988.

Evergreen trees, to 8 m high; bark pale reddish-brown, smooth; branchlets fulvous pubescent. Leaves simple, alternate, 9.5-14 x 4-6.5 cm, elliptic, ovate or oblong-ovate apex obtuse or shortly obtusely acute, base round or truncate, margin entire, glabrous except sometimes midrib and nerves, shining above, reddish glaucous beneath, coriaceous; lateral nerves 5-9 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole upto 10 mm long, stout, pubescent. Flowers bisexual, minute, in axillary or lateral fulvous pubescent panicles of 9 cm long; peduncle upto 3 cm long; pedicels short; bracts oblong, upto 3 mm long, deciduous; bracteoles minute, deciduous. Perianth tube narrowed at the top; lobes 6, subequal, in 2 rows, pubescent. Stamens 9 perfect, in 3 rows, those of the 2 outer series with eglandular filaments and introrse anthers, connective produced into acute tip; those of the third series with 2 glandular filaments and extrorse anthers with obtuse connective tip; filaments villous; anthers 2-celled; those of the fourth series replaced by 3 stipitate staminodes. Ovary sessile, half inferior, enclosed in the perianth tube; style short, exerted. Fruit a drupe 10 x 6 mm enclosed in accrescent perianth tube, puberulous, perianth more or less free from pericarp.

Ambalappara, *KVB 31744*

Fl. & Fr.: March-April

Distribution: Fairly common in Evergreen forests of Ambalappara and Pothurumi. Endemic to southern Western Ghats; Conservation status: Vulnerable.

LITSEA Lam., Encycl. Meth., Bot. 3: 574. 1792, *nom. cons.*

- 1a. Leaves white-glaucous below 2
 1b. Leaves not as above 3

- 2a. Inflorescence on fascicles *L. beddomei*
 2b. Inflorescence umbellules *L. stocksii*
 3a. Leaves subverticillate; umbels solitary *L. ghatica*
 3b. Leaves alternate; umbels not solitary 4
 4a. Umbellules sessile *L. coriacea*
 4b. Umbellules peduncled 5
 5a. Leaf margins recurved *L. wightiana*
 5b. Leaf margin not as above *L. floribunda*

Litsea beddomei Hook. f., Fl. Brit. India 5: 177. 1886; Gamble, Fl. Pres. Madras 1237(866). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 395. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 700. 2009.

Trees, to 5 m tall. Leaves simple, alternate, 15 x 3.5 cm, linear-oblong or lanceolate, obtuse, glabrous above, white-glaucous beneath when dry; main nerves 8-10 pairs rather close and prominent. Male flowers ca. 0.7 cm long, pubescent; pedicel ca. 0.8 cm long. Perianth tube hemispheric, ca. 1 cm across. Berries ca. 1.2 cm long, oblong, apiculate, seated on an enlarged perianth tube with a more or less thickened pedicel, shining black when dry; seeds 2, ca. 0.8 cm long.

Pothurumi, NS & KJD 25547

Fl. & Fr.: September-January

Distribution: Fairly common in Evergreen forests of Ambalappara and Pothurumi. Endemic to southern Western Ghats; Conservation status: Endangered.

Litsea coriacea (Heyne ex Meisner) Hook. f., Fl. Brit. India 5: 166. 1886; Gamble, Fl. Pres. Madras 1236(865). 1925; Manilal & Sivar., Fl. Calicut 251. 1982; Ansari, Fl. Kasaragod Div. 325. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 395. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 700. 2009. *Tetranthera coriacea* Heyne ex Meisner in DC., Prodr. 15: 186. 1864.

Dioecious trees, to 12 m high, bark pale brown, thinly scaly; branchlets puberulous, rather slender. Leaves simple, alternate, 8.5-17.5 x 2.5-7.5 cm, elliptic-lanceolate or elliptic-ovate, apex acute or acuminate, base acute or cuneate, margin entire, coriaceous, glabrous above, minutely puberulous beneath; petiole 5-10 mm long, slender, pubescent; lateral nerves 6-9 pairs, pinnate, slender, prominent, intercostae reticulate, obscure. Flowers unisexual, white, in 4-flowered axillary, subsessile, crowded umbels; bracts 4, silky; perianth tube funnel shaped, finely silky, lobes 6. Stamens 12, in 4 rows; those of rows 1 and 2 usually eglandular, glands of those opposite to tepals very large; staminodes in female flowers as the stamens of males, but those of inner rows subulate and 2-glandular. Ovary half inferior, ovoid; style slender; stigma small, erect. Fruit a berry, 10-12 mm long, ovoid, greenish-white, seated on a thickened perianth tube.

Meenmutty, KVB 31270, 31232; 'S' valavu, KVB 31535

Fl. & Fr.: November-February

Distribution: Common in all areas except places above 1000 m elevation. Endemic to Peninsular India.

Litsea ghatica Saldanha, Fl. Karnataka 1: 67. 1984; Subram. *et al.*, Indian For. 115: 117. 1989; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 702. 2009.

Dioecious shrubs or small trees; young shoots tomentose, elongating through terminal scales. Leaves simple, alternate, 10-20 x 4-9 cm, subverticillate, obovate, apex abruptly acute or obtuse, tapering to subacute or rounded base, glabrous except nerves above, more or less softly tomentose beneath; nerves 10-14 pairs, prominent beneath, looped; petiole to 1 cm long. Flowers unisexual, 4-5, in solitary umbels; peduncle 5-8 mm long, cauliferous; bracts ovate, usually in 2 pairs, tomentose without. Perianth 6-lobed; tube short or absent. Stamens 16, biseriate; filaments hairy; anthers 4-celled; staminodes with stalked glands.

Pookundu, *KJD 26198*

Fl. & Fr.: September-February

Distribution: Fairly common in Semi-Evergreen forests of Valayamchal to Narikkadavu. Endemic to Western Ghats.

Litsea floribunda (Blume) Gamble, Fl. Pres. Madras 1238(867). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 395. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 701. 2009. *Cylicodaphne floribunda* Blume, Mus. Bot. Lugd.-Bat. 1: 387. 1851. *Litsea wightiana* Hook. f., Fl. Brit. India 5: 177. 1886, quoad descr.

Dioecious trees, to 15 high, bark light brown, smooth, brittle, lenticellate; lenticels horizontal; branchlets brown to black, pubescent. Leaves simple, alternate, 7.5-28 x 3.7-10.5 cm, elliptic, obovate-oblong, elliptic-oblong or ovate-oblong, apex acute, or acuminate, base acute, margin entire, glabrous above except midrib above and rusty tomentose beneath, coriaceous; petiole 10-15 mm long, stout, pubescent; lateral nerves 10-15 pairs, pinnate, prominent; intercostae subscalariform, prominent. Flowers unisexual, in axillary racemose umbellule; peduncle upto 1 mm long, silky pubescent; bracts 4, orbicular, silky tomentose; flowers 6-8 in an umbellule. Perianth tube turbinate, silky tomentose, lobes 6. Stamens 12, in 4 rows; filaments hairy, those of rows 1 and 2 usually eglandular, those of rows 3 and 4 with 2-glands; anthers 4-celled, introrse; staminodes in female flowers as the stamens of males but those of the outer rows clavate or linear, those of the inner rows subulate and 2 glandular. Ovary half inferior, stigma capitate. Fruit a berry, 12-18 mm long, oblong, seated on a turbinate perianth tube.

Ambalappara, *KVB 31660; NS & KJD 31953*

Fl. & Fr.: December-April

Distribution: Fairly common in Evergreen forests of Chelachode to Moonamthode, Ambalappara and Chavachi. Endemic to Western Ghats.

Litsea stocksii (Meisner) Hook. f. **var. glabrescens** (Meisner) Hook. f., Fl. Brit. India 5: 176. 1886; Gamble, Fl. Pres. Madras 1236(865). 1925.

Cylicodaphne wightiana Nees *var. glabrescens* Meisner in DC., Prodr. 15:201. 1864.

Dioecious trees, to 20 m high, bark brown, smooth, slightly rugose. Leaves simple, alternate, 6.5-17 x 3-7.5 cm, oblong, elliptic-oblong or elliptic-lanceolate, apex acute or obtuse, base acute, margin entire, glabrous, reddish-brown beneath when dry, coriaceous; petiole 10-30 mm long, stout, grooved above, glabrous; lateral nerves 8-12 pairs, pinnate, obscure, intercostae obscure. Flowers unisexual, yellowish, in umbellules, in axillary racemes upto 6 cm long; peduncles to 6 mm long; bracts orbicular, pubescent. Perianth short; lobes 6, 2.5 x 3 mm, ovate, obtuse, pubescent. Stamens 9, in 3 rows, all

filaments with sessile glands at the base, filaments hairy; staminodes 9, in 3-series, glandular at base. Ovary half inferior, papillose. Fruit a berry, 2-2.5 cm across, subtended by the cupular perianth, red with white spots.

Ambalappara, KVB 31598

Fl. & Fr.: December-February

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Peninsular India.

Litsea wightiana (Nees) Hook. f. in Benth. & Hook. f., Gen. Pl. 3: 162. 1880,p.p; Gamble, Fl. Pres. Madras 1238(866). 1925; Mohanan & Sivad., Fl. Agasthyamala 572. 2002. *Cylicodaphne wightiana* Nees in Wall., Pl. Asiat. Rar. 2: 68. 1831.

Large trees. Leaves simple, alternate, to 11 x 4 cm, elliptic-lanceolate, acute, cuneate at base, coriaceous, reddish brown beneath, tomentose, later becomes glabrous; nerves ca. 8 pairs, transverse nervules faint, margins thick; petiole to 2 cm. Racemes axillary, to 7 cm; umbellules 8 mm across, globose, ferrugineous, tomentose.

Ambalappara, KVB 31656

Fl. & Fr.: March-November

Distribution: Rare in Evergreen forests of Ambalappara and Pothurumi. Endemic to southern Western Ghats.

NEOLITSEA (Benth.) Merr., Phillip. J. Sci. 1 (Suppl.): 56. 1906, *nom. cons.*

1a. Leaves ovate, nerves 3-ribbed, *N. scrobiculata*

1b. Leaves elliptic, penni-nerved,..... *N. cassia*

Neolitsea cassia (L.) Kosterm., J. Sci. Res.(Jakarta) 1: 85. 1952; Ramach. & V.J. Nair, Fl. Cannanore Dist. 397. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 703. 2009. *Laurus cassia* L., Sp. Pl. 369. 1753.

Neolitsea zeylanica (Nees) Merr., Philipp. J. Sci. Suppl. 1: 57. 1906; Gamble, Fl. Pres. Madras 1239(867). 1925; Vajr., Fl. Palghat Dist. 406. 1990.

Litsea zeylanica Nees, Amoen. Bot. Benn. Fasc. 1: 58. t. 5. 1823; Hook. f., Fl. Brit. India 5: 178. 1886.

Deciduous trees, to 18, bark grey, rough, brittle. Leaves simple, alternate, opposite or in whorls, elliptic, elliptic-lanceolate or oblong-lanceolate, apex acute, base acute or attenuate, margin entire, glabrous above and glaucous beneath, reticulation areolate, coriaceous; 3-ribbed near the base, faint; lateral nerves 1-4 pairs, pinnate, very faint; intercostae scalariform, faint. Flowers unisexual, yellowish-green, densely sericeous, in sessile umbels on extremely short branchlets at internodes; bracts 5 mm long, orbicular, concave, sericeous, rather thin. Tepals 4, 2-3 mm long, narrowly ovate or oblong, acute. Stamens 6, in 3 rows; those of 2 outer rows eglandular, those of the inner row biglandular opposite the first row; filaments 4-5 mm long, greenish-yellow, thread-like, glabrous; anthers 0.5 mm long, introrse. Ovary half inferior, ovoid; style long; stigma large peltate; staminodes 6, in 3 rows. Fruit a drupe 10-12 mm across, globose, seated on disc like, crenate perianth cup of 5 mm diameter; pedicel slender.

Ambalappara, KVB 31571

Fl. & Fr.: February-April

Distribution: Fairly common in Evergreen forests of Ambalappara, Pothurumi and Kattikari.

Neolitsea scrobiculata (Meisner) Gamble, Fl. Pres. Madras 1240(868). 1925; Swarup. et al., Shola For. Kerala 56. 1998; Anil Kumar et al., Fl. Pathanamthitta 426. 2005. *Litsea scrobiculata* Meisner in DC., Prodr. 15: 223. 1864. *Litsea zeylanica* sensu Hook. f., Fl. Brit. India 5: 178. 1886, p.p., non Nees 1823.

Deciduous evergreen trees, to 15 m high; bark grey, smooth; branchlets glabrous, black. Leaves simple, alternate, subopposite or in whorls, 5-11 x 2.5-6 cm, elliptic-ovate or ovate, base acute or attenuate, apex obtusely acute or acuminate, margin entire, glabrous above, glaucous beneath, densely scrobiculate, coriaceous; 3-ribbed from base; petiole 15-25 mm long, slender, glabrous; lateral nerves 2-3 pairs, pinnate, faint, intercostae scalariform, faint. Flowers unisexual, 3-8 in axillary, subsessile umbellules; involucre bracts 4, concave, naviculate, deciduous; male flowers: 5 mm across, tepals 4. Stamens 6 in 3 whorls of 2 each, those of the 2 outer rows eglandular, those of the inner row biglandular opposite the first row; filaments to 0.5 mm; anthers 4-celled, 1 m, upper cells introrse, lower lateral; pistillode linear, to 1.5 mm; female flowers: 6 mm across; tepals 4, free, lanceolate, 3 mm, acute. Ovary 7 x 5 mm, half inferior, globose; style 2 mm; stigma discoid; staminodes 6, in 3 series, first and second whorl linear, third whorl of stalked staminodes with 2-lobed sterile anthers. Fruit a drupe 8 mm across, globose, with a basal rim of perianth tube; epicarp fleshy, crinkled, brownish-black when dry; seed 6 mm across, globose.

Kannadivechakunnu, NS & KJD 25549

Fl. & Fr.: May-August

Distribution: Rare in Evergreen forests of Kannadivechakunnu. Endemic to Western Ghats.

PERSEA Mill., Gard. Dict. ed. 4, 1754. *nom. cons.*

Persea macrantha (Nees) Kosterm., Reinwardtia 6: 193. 1962; Ramach. & V.J. Nair, Fl. Cannanore Dist. 397. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 703. 2009. *Machilus macrantha* Nees in Wall., Pl. Asiat. Rar. 2: 70. 1831; Hook. f., Fl. Brit. India 5: 140. 1886; Gamble, Fl. Pres. Madras 1227(859). 1925.

Evergreen trees, to 30 m high, bark pale brown, mottled with dark blotches, scurfy and thinly scaly, rough, exfoliations small, brittle; branchlets glabrous. Leaves simple, alternate, clustered at the tip of branchlets, 6.5-20 x 3.7-10 cm, oblong, elliptic-oblong or ovate-oblong, apex obtuse or obtusely acute, base oblique or acute, margin entire, glabrous, glaucous beneath, coriaceous; petiole 15-40 mm long, stout, grooved above, glabrous; lateral nerves 6-12 pairs, pinnate, prominent, intercostae reticulate, obscure. Flowers bisexual, 10-12 mm across, pale yellow, in panicles from upper axils and terminal. Perianth tube very short, tepals 6, subequal, in 2 series, 4-5 mm, obovate, puberulous; persistent, spreading or reflexed in fruit. Stamens 9 perfect, those of first and second row opposite the perianth lobes, introrse, with long filaments, those of third row opposite the first row, extrorse with slender filaments and a pair of stipitate glands at their base, filaments pubescent 2.5 mm; anthers 4-celled; staminodes 3, in row 4 and opposite the row 2, 4 mm long, stalked, arrow shaped, pubescent. Ovary half inferior, sessile, 1-celled; ovule 1, pendulous; style, slender, 2 mm; stigma discoid. Fruit a berry 15-18 mm across, globose, green with white specks, aromatic, with a basal persistent rim of perianth; lobes reflexed in young fruits, deciduous later; epicarp red when ripe; seed one, globose.

Valayamchal, KJD 26274

Fl. & Fr.: December-May

Distribution: Fairly common in Semi-evergreen forests of Valayamchal to Pookundu.

PHOEBE Nees, Syst. Laurin. 98. 1836.

Phoebe lanceolata Nees, Syst. Laurin. 109. 1836; Hook. f., Fl. Brit. India 5: 141. 1886; Gamble, Fl. Pres. Madras 1228(860). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 398. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 704. 2009.

Evergreen trees, to 12 m high, bark greyish-brown, smooth, bark yellowish-white or grey, smooth with shallow fissures, exfoliating in thick flakes, fibrous. Leaves simple, alternate, clustered at the tip of branchlets, 8-25 x 2.5-4.5 cm, lanceolate, elliptic-obovate or elliptic-oblancoate, base cuneate, apex long acuminate, margin entire, glabrous, coriaceous; lateral nerves 6-13 pairs, pinnate, prominent, intercostae scalariform, faint; petiole 5-20 mm long, slender, grooved above, glabrous. Flowers bisexual, 2-5 mm across, yellowish-green, in axillary, slender panicles. Perianth tube short; lobes 6, ovate, tomentose, unequal, accrescent. Stamens 9 perfect, in 3 rows, those of first and second row introrse, eglandular, those of third row extrorse with 2 large stipitate glands at base; staminodes of row 4 stipitate, cordate; anthers 4-celled. Ovary half inferior, sessile, globose, pubescent; style slender; stigma discoid. Fruit a drupe, 10-12 mm long, ovoid or ellipsoid, glabrous, black; supported by erect perianth lobes.

Kattikari State Boundary, *KJD 26018*; way To Mullenpara, *KJD 26067*
Fl. & Fr.: January-March
Distribution: Fairly common in Evergreen forests of Mullenpara-Kattikari Region.

ELAEAGNACEAE

ELAEAGNUS L., Sp. Pl. 121. 1753.

Elaeagnus indica Serv., Bull. Herb. Boiss. ser.2, 8: 393. 1908; Gamble, Fl. Pres. Madras 1246(872). 1925; Anil Kumar et al., Fl. Pathanamthitta 427. 2005.

Woody climbers, densely covered with silvery scales, thorns axillary, straight, 1-2 cm long. Leaves simple, alternate, 9-14 x 6-7.5 cm, ovate, apex acute, glabrous above, silvery-white below; lateral nerves 5-7 pairs, indistinct. Flowers bisexual, 3-6 in axillary fascicles, pedicelled. Perianth greenish white, 1 cm long, urceolate, gamotepalous, lobes 4, ovate. Stamens 4, filaments free, broadened below, anthers transverse. Ovary 1-celled, inferior; ovule solitary; style filiform, stigma lateral. Nut 2.6 x 1.2 cm, covered with thickened perianth base, reddish, fleshy.

Kattikari, *KVB 31672*

Fl. & Fr.: December-April

Distribution: Rare in Evergreen forests of Kattikari.

LORANTHACEAE

- 1a. Flowers arise on subtended campanulate involcre Tolypanthus
- 1b. Flowers arise on stems, involcre not campanulate 2
- 2a. Petals 4 3
- 2b. Petals 5-6 4
- 3a. Corolla gamopetalous, lobes acute, flowers in fascicles or cymes Scurrula
- 3b. Corolla polypetalous, lobes obtuse, flowers in spikes or racemes Helixanthera
- 4a. Bracteoles present, calyx tubular Macrosolen
- 4b. Bracteoles absent, calyx copular 5
- 5a. Flowers sessile Helicanthes
- 5b. Flowers pedicelled 5
- 6a. Flowers in elongated many flowered racemes Dendrophthoe
- 6b. Flowers solitary or in few flowered fascicles or short racemes Taxillus

DENDROPHTHOE Mart., Flora 13. 1830.

- 1a. Branches trigonus..... *D. trigona*
1b. Branches terete..... *D. falcata* var. *falcata*

Dendrophthoe falcata (L. f.) Etting., Denkschr. Kaisel. Akad. Wiss. Math.-Naturwiss. Klasse 32: 52,53,58. t.13. 1871, var. *falcata*; Manilal & Sivar., Fl. Calicut 252. 1982; Ansari, Fl. Kasaragod Div. 326. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 399. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 707. 2009. *Loranthus falcatus* L. f., Suppl. Pl. 211. 1781. *Loranthus longiflorus* Desr. in Lam., Encycl. 3: 598. 1792; Hook. f., Fl. Brit. India 5: 214. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925. *Loranthus longiflorus* Desr. var. *falcata* (L. f.) Kurz, For. Fl. Burma 2: 321. 1877; Hook. f., Fl. Brit. India 5: 215. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925. *Loranthus longiflorus* Desr. var. *amplexifolia* (DC.) Thw., Enum. Pl. Zeyl. 134. 1859; Hook. f., Fl. Brit. India 5: 215. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.

Parasitic shrubs, stem woody, terete, lenticellate. Leaves simple, subopposite, 5-10 x 3-4.5 cm, ovate-oblong to lanceolate, apex acute or obtuse, base truncate, obtuse or cordate, thickly coriaceous; petiole 2-3 mm long or absent. Inflorescence axillary and lateral, curved racemes, 3-5 cm long, many-flowered; pedicels c. 3 mm long. Calyx 2-3 mm long, truncate. Corolla tube pink, 2.5-3.5 cm long, curved, slender at base, widening to top; lobes green, 0.7-1 cm long, c. 2 mm wide, linear, recurved. Filaments bright red, c. 4 mm long; anthers yellow, linear-oblong. Ovary 2-3 mm long. Berry 1-1.5 x 0.3-0.4 cm, oblong, crimson.

Ambalappara, KVB 31783

Fl. & Fr.: December-May

Distribution: Common in the Sanctuary.

Dendrophthoe trigona (Wight & Arn.) Danser ex Sant., Rec. Bot. Surv. India 16:163. 1953; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 708. 2009. *Loranthus trigonus* Wight & Arn., Prodr. 386. 1834; Hook. f., Fl. Brit. India 5: 219. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.

Parasitic shrubs; branches to 15 mm thick, rugose, glabrous; branchlets often acutely 3-angled. Leaves simple, alternate, 20 x 13 cm, ovate, obtuse, acute at base, thickly coriaceous; petiole to 1.5 cm long, flattened or winged. Flowers in axillary, to 3 cm long racemes or cymes; bracts forming a shallow oblique cup. Calyx cupular, truncate, glabrous. Corolla 15-20 mm long, pink or yellow, tube split to the middle, lobes 5, linear. Berry 1 x 0.5 cm, obovoid, crowned by the cup-shaped calyx limb.

Chavachi, NS & KVB 31314

Fl. & Fr.: May-September

Distribution: Common in Evergreen forests of Chavachi, Kattikari, Chelachode, Kariyenkappu and Semi-evergreen forests of Narikkadavu, Pookundu and Paripode. Endemic to Western Ghats.

HELICANTHES Danser, Verh. Kon. Ned. Akad. Wet., Afd. Natuurk. Sect. 29(6): 5. 1933.

Helicanthes elastica (Desr.) Danser, Verh. Kon. Akad. Wet. Afd. Natuurk. Sect. 2. 29: 55. 1933; Manilal & Sivar., Fl. Calicut 253. 1982; Ansari, Fl. Kasaragod Div. 327. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 708. 2009. *Loranthus elasticus* Desr. in Lam., Encycl. 3: 599. 1792; Hook. f., Fl.

Brit. India 5: 216. 1886; Gamble, Fl. Pres. Madras 1254(877). 1925. *Dendrophthoe elasticus* (Desr.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 308. 1929.

Semi-parasitic dichotomously branched subshrubs; branchlets woody, swollen at nodes, glabrous. Leaves opposite, 4-8 x 1.5-4 cm, ovate or elliptic-oblong, base obtuse or truncate, apex acute or obtuse, thickly coriaceous, glaucous beneath, basally 3-nerved; sessile or subsessile. Flowers aggregated in short axillary fascicles. Calyx minute, flask-shaped, margin truncate. Corolla white with green stripes, 2.5-3.5 cm long, split lengthwise into 5 linear, twisted lobes. Stamens 5, exserted, filaments crimson. Ovary ca. 1.5 mm long; style 3-3.5 cm long; stigma ovoid. Berry 6-8 x 3-3.5 mm, obovoid, red.

Kannadivechakunnu, *KJD 26390*

Fl. & Fr.: December-March

Distribution: Common on Cashew, also seen in other trees. Endemic to Peninsular India.

HELIXANTHERA Lour., Fl. Cochinch. 142. 1790.

- 1a. Bracts with a small appendage, corolla dark brown at apex; branches tomentose..... *H. obtusata*
- 1b. Bracts with out appendages, corolla purplish at apex; branches glabrous 2
- 2a. Corolla 4-angled in buds *H. intermedia*
- 2b. Corolla terete in buds..... *H. wallichiana*

Helixanthera intermedia (Wight) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 317. 1929; Ramach. & V.J. Nair, Fl. Cannanore Dist. 400. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 709. 2009. *Loranthus intermedius* Wight, Calcutta J. Nat. Hist. 6: 361. 1846; Hook. f., Fl. Brit. India 5: 205. 1886; Gamble, Fl. Pres. Madras 1251(876). 1925.

Parasitic glabrous shrubs. Leaves simple, alternate, 4-8 x 3-5 cm, ovate, obtuse, coriaceous, base obtuse, truncate, or sub-cordate; petiole 1 cm long. Racemes 7 cm long, axillary, many-flowered; pedicel 7 mm long, slender, glabrous. Flower buds 4-angled and curved. Calyx truncate. Corolla lobes 4, straight, purplish pink or yellowish green, free to the base. Stamens 4; filaments attached below the middle of the corolla; stigma globose.

Ambalappara, *NS & KVB 31355*

Fl. & Fr.: February-March

Distribution: Fairly common in Evergreen forests of Ambalappara. Endemic to southern Western Ghats.

Helixanthera obtusata (Schult.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 317. 1929; Ansari, Fl. Kasaragod Div. 327. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 709. 2009. *Loranthus obtusatus* Schult. in Roem. & Schult., Syst. Veg. 7: 1650. 1830; Hook. f., Fl. Brit. India 5: 205. 1886; Gamble, Fl. Pres. Madras 1251(876). 1925.

Parasitic shrubs, branchlets terete, slender, ferruginous-tomentose. Leaves simple, alternate, to 14 x 8 cm, ovate, obtuse, base rounded, coriaceous, glabrous, young leaves usually red; petiole 1 cm long. Flowers in many flowered axillary racemes which are solitaru or 2-3 together, to 8 cm long, densely golden tomentose; bracts with a small appendage.; pedicel 5 mm long, reflexed; Calyx 3 mm long, cylindrical, slightly constricted at mouth, limb very short. Corolla dark pink, dark purple inside to 18 mm long, 4-angular

and curved in bud, lobes 4, free, tomentose outside. Anthers dark brown. Style 4 angled, stigma capitate. Berry 4 mm long, ovoid, truncate at apex somewhat tuberculate.

Ambalappara, NS & KVB 31351; KJD 26029; Kattikari, NS & KVB 31383
Fl. & Fr.: April-July

Distribution: Rare in Evergreen forests of Ambalappara, Asthiparaa and Kattikari. Endemic to Western Ghats.

Helixanthera wallichiana (Schult.) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 319. 1929; Manilal & Sivar., Fl. Calicut 252. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 400. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 709. 2009. *Loranthus wallichianus* Schult. in Roem. & Schult., Syst. Veg. 7: 100. 1829; Hook. f., Fl. Brit. India 5: 205. 1886; Gamble, Fl. Pres. Madras 1251(876). 1925.

Parasitic shrubs, branchlets terete, rugose or lenticellate. Leaves simple, alternate and opposite, 5-10 x 3-6 cm, ovate, obtuse, base acute or rounded glabrous; lateral nerves 2 or 3 pairs; petiole 0.8-2 cm long. Flowers in slender to 3-6 cm long, glabrous racemes; pedicel 3 mm long; bract adenate to the pedicel, spoon-shaped, ciliate. Calyx globose, 2 mm long, limb annular, obscure. Corolla reddish, terete in bud, lobes 4, ovate, acute, glabrous. Berry 6 mm long, ovoid, rugose.

Ambalappara, KJD 26130

Fl. & Fr.: July-September

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to Western Ghats.

MACROSOLEN (Blume) Reichb., in J. A. Schultes & J. H. Schultes in

J. J. Roemer & J. A. Schultes, Syst. Veg. 7: 1731. 1830.

Macrosolen capitellatus (Wight & Arn.) Danser, Blumea 2: 36. 1936; Manilal & Sivar., Fl. Calicut 252. 1982; Ansari, Fl. Kasaragod Div. 327. 1985. *Loranthus capitellatus* Wight & Arn., Prodr. 382. 1834; Hook. f., Fl. Brit. India 5: 221. 1886. *Elytranthe capitellata* (Wight & Arn.) Engl. in Engl. & Prantl, Naturl. Pflanzenfam. 3(1): 189. 1889; Gamble, Fl. Pres. Madras 1255(879). 1925.

Parasitic shrubs, branches 2-angulr, glabrous. Leaves simple, 5-8 x 2-3 cm, elliptic-lanceolate, acute, cuneate at base, coriaceous; nerves 2 or 3 pairs, obscure; petiole to 7 mm long. Flowers 2-4 together, nearly sessile, on very short peduncle; bracts and bracteoles similar, ovate to orbicular, keeled. C 5 mm long, cylindric, apex truncate with short rounded lobes. Corolla to 2 cm long, yellow to white in the tubular part and scarlet green at apex, split below the middle; lobes 6, linear or linear spathulate. Stamens 6, anthers multilocellate. Berry 6 x 5 mm, purple-black when ripe, ellipsoid, beaked with persistent calyx tube.

Kariyenkappu, KJD 26001

Fl. & Fr.: April-July

Distribution: Fairly common in Plantations of Kariyenkappu.

SCURRULA L., Sp. Pl. 110. 1753.

Scurrula parasitica L., Sp. Pl. 110. 1753; Ramach. & V.J. Nair, Fl. Cannanore Dist. 401. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 710. 2009. *Loranthus buddleioides* Desr. in Lam., Encycl. 3: 660. 1792; Gamble, Fl. Pres.

Madras 1251(876). 1925; Mohanan, Fl. Quilon Dist. 350. 1984. *Loranthus scurrula* L., Sp. Pl. (ed. 2) 472. 1762; Hook. f., Fl. Brit. India 5: 208. 1886.

Parasitic shrubs; branches terete, rusty tomentose. Leaves simple, opposite, 5-9 x 3-5 cm, ovate, rounded at base and apex, coriaceous, golden tomentose below; petiole to 1 cm long. Flowers in axillary fascicles or shortly peduncled cymes, 16-20 together; bract ovate, concave, densely tomentose. Calyx 2-3 mm long, cupular, grey tomentose, limb truncate, entire. Corolla 15 mm long, greenish-yellow, slender, densely tomentose; lobes 4, ovate, acute. Stamens 4, filaments flattened, glabrous. Stigma clavate. Berry 6-8 mm long, obovoid, densely hairy.

Kariyenkappu, *KJD 31869*

Fl. & Fr.: November-February

Distribution: Fairly common in Plantations of Kariyenkappu.

TAXILLUS van Tieghem, Bull. Soc. Bot. France 42: 256. 1895.

1a. Corolla densely tomentose, inflated above *T. tomentosus*

1b. Corolla glabrescent, not inflated *T. cuneatus*

Taxillus cuneatus (Heyne ex Roth) Danser, Bull. Jard. Bot. Buitenz. ser. 3, 10: 354. 1929. *Loranthus cuneatus* Heyne ex Roth, Nov. Pl. Sp. 193. 1821; Hook. f., Fl. Brit. India 5: 214. 1886; Gamble, Fl. Pres. Madras 1253(877). 1925.

Parasitic shrubs, branches slender, rugulose, glabrous. Leaves simple, alternate, to 3 x 1.5 cm, obovate, rounded or retuse at apex, base cuneate and decurrent to the petiole; nerves obscure; petiole 2-4 mm long. Flowers 2-5 in axillary sessile or pedunculate fascicles; bracts 2 mm long, obovate. Calyx 2 mm long, tube subcylindric, limb irregularly toothed, pubescent. Corolla 2-3 cm long, tube inflated at middle, curved, 5-ribbed, greenish-white; lobes linear, recurved or spreading. Stamens exerted beyond the corolla tube; filaments dark red. Berry 8 mm long, ovoid, crowned by the calyx teeth, crimson.

Ambalappara, *NS & KVB 31420*

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Ambalappara.

Taxillus tomentosus (Heyne ex Roth) Tieghem, Bull. Soc. Bot. France 42: 256. 1895; Ramach. & V.J. Nair, Fl. Cannanore Dist. 401. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 711. 2009. *Loranthus tomentosus* Heyne ex Roth, Nov. Pl. Sp. 191. 1821; Hook. f., Fl. Brit. India 5: 212. 1886; Gamble, Fl. Pres. Madras 1252(876). 1925.

Parasitic shrubs, branches lenticellate, young shoots fulvous tomentose. Leaves simple, to 5 x 2.5 cm, obovate to oblong, obtuse, glabrous above; nerves 4-5 pairs; petiole 5 mm long. Flowers 3-8, fascicled; pedicels 2 mm long. Calyx 2 mm long, lobes triangular, acute, tomentose. Corolla 1.5 cm long, split to the middle, greenish-white, 5-angled, densely hairy, tube gibbous, lobes green spreading or recurved. Stamens 5; filaments red. Style bulbous at the middle, stigma hemispheric. Berry subglobose, tomentose.

Ambalappara, *KVB 31775*

Fl. & Fr.: December-January

Distribution: Rare in Evergreen forests of Ambalappara.

TOLYPANTHUS Blume. Syst. Veg. ed. 15. 1731. 1830.

Tolypanthus lagenifer (Wight) Tieghem, Bull. Soc. Bot. France 42: 249. 1895; Ramach. & V.J. Nair, Fl. Cannanore Dist. 402. 1988; Vajr. et al., Journ. Econ. Tax. Bot. 5:424. 1984; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 711. 2009. *Loranthus lageniferus* Wight, Ic. t. 306. 1840; Hook. f., Fl. Brit. India 5: 218. 1886; Gamble, Fl. Pres. Madras 1254(878). 1925.

Parasitic shrubs; stem stout, glabrous, lenticellate. Leaves simple, opposite, 6-9 x 3-6 cm, reddish when young, ovate or ovate-oblong, apex obtuse or acute, base rounded; petiole 5-6 mm long. Flowers subsessile, fascicled on woody stem, subtended by reddish or yellowish campanulate, 5-lobed, 2-3 cm long involucre. Calyx 2.5-3 mm long, united; lobes 5, triangular. Corolla 2-2.5 cm long, green or reddish; tube dilated above the middle; lobes 5, short, linear-oblong. Stamens 5; filaments short; anthers linear. Ovary inferior, 1-loculed; style erect; stigma capitate.

Narikadavu, NS & KVB 31442

Fl. & Fr.: August-November

Distribution: Common in the Sanctuary. Endemic to Western Ghats.

VISCACEAE

VISCUM L., Sp. Pl. 1023. 1753.

Viscum angulatum Heyne ex DC., Prodr. 4: 283. 1830; Hook. f., Fl. Brit. India 5: 225. 1886; Gamble, Fl. Pres. Madras 1259(881). 1925; Sanjai & Balakr., Rheedeia 16: 88. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 712. 2009.

Parasitic leaf less shrubs, branches 4-angled, drooping, slightly broadened near the apex of the internode, smooth. Flowers solitary or 3-together, axillary, all female, all male or middle one female and laterals male. Perianth lobes in male flowers 4, triangular, connate below. Stamens 4, epiphyllous, anthers sessile. Ovary obovoid, style short or absent. Berry 5 x 5 mm, globose, yellowish.

Ambalappara, NS & KVB 31431

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Ambalappara.

SANTALACEAE

- 1a. Plants armed; inflorescence on drooping spikes Scleropyrum
1b. Plants unarmed; inflorescence cyme 2
2a. Tepals 5, flowers in paniculate cymes Santalum
2b. Tepals 3, flowers in cymes Osyris

OSYRIS L., Sp. Pl. 2: 1022. 1753.

Osyris quadripartita Salzm. ex Decne., Ann. Sci. Nat. Bot. ser. 2, 6: 65. 1836; Sasidh., Fl. Chinnar WLS 276. 1999. *Osyris wightiana* Wall. ex Wight, Ic. t. 1853. 1852. *Osyris arborea* Wall. ex A. DC. in DC., Prodr. 14: 633. 1857; Hook. f., Fl. Brit. India 5: 232. 1886; Gamble, Fl. Pres. Madras 1262(883). 1925.

Shrubs glabrous shrubs; branchlets sharply triangular. Leaves simple, alternate, to 4 x 2 cm, elliptic, mucronate, glaucous and pubescent below; petiole 1-3 mm. Flowers yellowish-green, small axillary. Male flowers in long peduncled shortly pedicelled 5-10 flowered umbels; bisexual flowers 1-3 on peduncles. Flowers 3-merous; tepals of male flowers basally connate, 2 mm,

ovate, hairy inside, spreading; stamens exserted. Ovary inferior sunk in the perianth tube; ovules 2-4, pendulous; style short, stigma 3-lobed. Drupe 5-8 mm long, yellow, subglobose.

Ambalappara, *KJD 26131; NS & KVB 31345*

Fl. & Fr.: January-July

Distribution: Margins of Grass lands and Evergreen forests of Ambalappara.

SANTALUM L., Sp. Pl. 349. 1753.

Santalum album L., Sp. Pl. 349. 1753; Hook. f., Fl. Brit. India 5: 231. 1886; Gamble, Fl. Pres. Madras 1261(883). 1925; Manilal & Sivar., Fl. Calicut 254. 1982; Ansari, Fl. Kasaragod Div. 328. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 402. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 713. 2009.

Evergreen trees, to 10 m high, bark surface dark grey to nearly black, rough with short vertical cracks. Leaves simple, opposite, 3.7-12 x 2-4 cm, elliptic, elliptic-ovate or ovate-lanceolate, apex acute, base acute or round, margin entire, glabrous, glaucous beneath, coriaceous; lateral nerves 8-13 pairs, pinnate, faint, intercostae reticulate, obscure; petiole 12-18 mm long, slender, glabrous, grooved above. Flowers bisexual, 5-6 mm across, reddish-purple, in axillary and terminal paniculate cymes, much shorter than leaves. Tepals 5, basally connate into a campanulate tube of 2 mm long, shortly connate to the basal part of the ovary; lobes 2.5 x 1.5 mm, ovate, thin, fleshy, glaucescent without, minutely ciliate; disc concave, adhering to the bottom of perianth, its lobes alternates with tepals. Stamens 5, alternates with disc; filaments 1 mm; anthers 0.7 mm, ovoid, 2-celled. Ovary superior later half inferior at the time of flowering, globose, 1 mm, 1-celled, ovules 2-3, pendulous from below the long, acuminate, central column; style 1.5 mm, stigma 3 lobed. Fruit a drupe, 8-12 mm across, globose, blackish-purple, annulate above, beaked with the basal part of the style; seed one.

Valayamchal, *KJD 18762*

Fl. & Fr.: November-December

Distribution: Palnted at Valayamchal.

SCLEROPYRUM Arn., in Mag. Bot. & Zool. 2: 549 1838, *nom. cons.*

Scleropyrum pentandrum (Dennst.) Mabb., Taxon 26: 533. 1977; Manilal & Sivar., Fl. Calicut 254. 1982; Ansari, Fl. Kasaragod Div. 329. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 403. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 714. 2009. *Pothos pentandrus* Dennst., Schluss. Hort. Malab. 16, 24, 33. 1818. *Scleropyrum wallichianum* (Wight & Arn.) Arn., Mag. Zool. Bot. 2: 550. 1838; Hook. f., Fl. Brit. India 5: 234. 1886; Gamble, Fl. Pres. Madras 1262(884). 1925. *Sphaerocarya wallichiana* Wight & Arn., Edinb. New Phil. J. 15: 180. 1833.

Small trees; trunk with sharp axillary thorns. Leaves simple, alternate, to 15 x 9 cm, ovate or oblong, acute or acuminate, base truncate or rounded, coriaceous; nerves 5 pairs, irregular; petiole 4 mm long, stout. Flowers polygamous on drooping spikes; bracts filiform, deciduous. Spikes unequal, solitary or fascicled, along mature stems, 5-10 cm long; bracts triangular, acuminate, 1.5 mm long, scarious. Perianth orange-yellow, adnated to the ovary in bisexual and female flowers and free in male flowers, 5-fid at apex. Stamens 4 or 5, anthers divaricate. Ovary inferior, 1-celled, 3-ovuled; style short; stigma peltate. Drupes pyriform, 2.5 x 2 cm; purple, crowned by the perianth tube; seed 1.

Narikkadavu, *KVB 31205*

Fl. & Fr.: October-April

Distribution: Rare in Semi-evergreen forests of Narikkadavu.

BALANOPHORACEAE

BALANOPHORA J.R. & G. Forst., Charact. Gen. 99, 100. 1776.

- 1a. Plants monoecious; heads yellow B. abbreviata
1b. Plants dioecious; heads reddish-brown B. fungosa ssp. indica

Balanophora abbreviata Blume, Enum. Pl. Jav. 1: 98. 1827; Sasidh. & Sivar., Fl. Pl. Thrissur For. 389. 1996; Anil Kumar et al., Fl. Pathanamthitta 431. 2005.

Monoecious herbs. Rhizome finely warted with lenticels, cream coloured. Scale leaves 4-6, ovate, acute, stiff, yellow. Heads ovoid or lanceoid. Male flowers 20-40, sessile, synandrium with 15-25 anther-loculi. Female flowers fully covering the exposed part of head; pedicels obconical at apex. Spadicles obovoid with a narrow basal and upper portion.

Ambalappara, NS & KJD 31985

Fl. & Fr.: September-January

Distribution: Rare in Evergreen forests of Ambalappara.

Balanophora fungosa J. R. & G. Forst., Char. Gen. Pl. 100. t. 50. 1776, ssp. **indica** (Arn.) Hansen, Dansk. Bot. Ark 28: 100. ff. 20 & 21. 1972; Ramach. & V.J. Nair, Fl. Cannanore Dist. 403. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 714. 2009. *Langsdorffia indica* Arn., Ann. Nat. Hist. 2:37. 1838. *Balanophora indica* (Arn.) Wall. ex Griff., Trans. Linn. Soc. London 20: 95. 1846; Hook. f., Fl. Brit. India 5: 237. 1886; Gamble, Fl. Pres. Madras 1263(885). 1925.

Dioecious, parasitic herbs, 10-25 cm high. Rootstock warted with lenticels. Stem stout, short, cylindric, 1.5-2 cm diam. Scale leaves 2.5-3.5 x 1.5-2 cm, ovate to sub orbicular, obtuse at apex, purple. Male inflorescence obovoid, dense raceme, 5-10 cm long, 3-6 cm wide. Flowers small, 0.4-0.6 cm long. Perianth lobes 2-6, white. Stamens 2-6 or more; filaments united. Female inflorescence globose heads, 2-5 cm diam., bright red in colour. Perianth 0. Ovary ellipsoid, minute.

Kattikari, KJD 31895

Fl. & Fr.: November-March

Distribution: Rare in Evergreen forests of Kattikari and Mullenpara.

EUPHORBIACEAE

- 1a. Flowers without perianth, arranged in cyathia; stamen 1 Euphorbia
1b. Flowers with perianth either 1 or 2 whorled, not arranged in cyathia; stamens 2 or more 2
2a. Leaves 3-foliolate Bischofia
2b. Leaves simple 3
3a. Cells of ovary 2-ovuled 4
3b. Cells of ovary 1-ovuled 14
4a. Perianth uniseriate 5
4b. Perianth 2-seriate 13
5a. Branchlets phyllanthoid 6
5b. Branchlets not phyllanthoid 8
6a. Disc absent or indistinct 7
6b. Disc present Phyllanthus
7a. Perianth lobes of male flowers turbinate Breynia
7b. Perianth lobes of male flowers spreading Sauropus

8a. Male and female flowers in fascicles or solitary	9
8b. Male flowers in elongated racemes or spikes, female in spikes racemes or cymes.	11
9a. Fruits dry, dehiscent.....	Glochidion
9b. Fruit fleshy, indehiscent.....	10
10a. Disc of 5 distinct glands; berry 6-seeded	Securinega
10b. Disc annular, berry 1-4 seeded.....	Drypetes
11a. Ovary 1-celled; disc annular, Fruit a drupe	Antidesma
11b. Ovary 2-4 celled; disc absent, Fruit a capsule	12
12a. Male flowers in catkins, female in short cymes	Aporusa
12b. Male and female flowers in elongated racemes, often cauliflorous	Baccaurea
13a. Ovary 2-celled; fruit a drupe with 2 pyrenes; lateral nerves of leaves close and parallel.....	Briedelia
13b. Ovary 3-celled; fruit a capsule; lateral nerves of leaves not parallel	Actephila
14a. Perianth in male flowers 2-seriate	15
14b. Perianth in male flowers 1-seriate.....	19
15a. Leaves with stalked glands at the base of lamina; stamens inflexed in the bud	Croton
15b. Leaves without stalked glands; stamens erect in the bud16
16a. Perianth in female flowers uniseriate	Blachia
16b. Perianth in female flowers biseriate	17
17a. Fruiting perianth accrescent and enlarged	Dimorphocalyx
17b. Fruiting perianth absent or not enlarged.....	18
18a. Petals smaller than the sepals	Agrostistachys
18b. Petals longer than the sepals	Paracroton
19a. Male and female flowers are borne in the same plant.....	20
19b. Male flowers and female flowers are borne in separate plants	26
20a. Twining herbs with stinging hairs	Tragia
20b. Erect plants without stinging hair	21
21a. Stamens 2, 3 or 5.....	22
21b. Stamens 8 or more	24
22a. Perianth lobes 2; stamens 2; trees with milky latex	Excoecaria
22b. Perianth lobes 3 or 5; stamens 3 or 5; herbs or shrubs without milky latex	23
23a. Perianth lobes in male 5; capsule coccus with 2 rows of spines	Microstachys
23b. Perianth lobes in male 3; capsule without spines	Micrococca
24a. Perianth lobes 5, linear lanceolate; disc present; style arms entire..	Baliospermum
24b. Perianth lobes 3 or 4; disc absent; style arms plumose or laciniate	25
25a. Stamens 4, filaments inflexed in the bud; trees	Epiprinus
25b. Stamens 8, filaments erect in the bud; herbs	Acalypha
26a. Leaves orbicular peltate; anthers 4-celled; ovary 1-celled	Macaranga
26b. Leaves not peltate; anthers 2-celled; ovary 2 or 3-celled	27
27a. Staminal filaments branched; shrubs	Homonoia
27b. Staminal filaments not branched; trees.....	28
28a. Fruit fleshy, indehiscent, smooth; leaves without glands beneath	Trewia
28b. Fruit a capsule with echinate process; leaves with gland beneath	Mallotus

ACALYPHA L., Sp. Pl. 1003. 1753.

- 1a. Male and female flowers in separate spikes, bracts minute, entire *A. paniculata*
 1b. Male and female flowers on same spikes, bracts deeply 3-5 lobed. *A. brachystachya*

Acalypha brachystachya Hornem., Cat. Hort. Hafn. Willd. Enum. Hort. Berol. 992. 1809; Hook. f., Fl. Brit. India 5: 416. 1887; Gamble, Fl. Pres. Madras 1330(930). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 124. 2007.

Prostrate or procumbent herbs; stems striate, puberulus. Leaves simple, alternate, ovate, acute, rounded to cordate at base, 3-5-nerved from base, sparsely hairy; petiole 0.5-2 cm long. Racemes to 1.5 cm long, bisexual,

axillary. Female flowers 1-4 at the base of the raceme, sessile; sepals 3-5, oblong, glandular-ciliate; styles 3, bifid above. Male flowers many, towards the upper part of raceme; perianth lobes glandular pubescent; stamens 8, free, on a dome-shaped receptacle. Capsule 2 x 2 mm, hispid; seeds ovoid with hilum at one end.

Paripode, *KJD 22559*

Fl. & Fr.: September-December

Distribution: Open areas in Semi-evergreen forests.

Acalypha paniculata Miq., Fl. Ind. Bat. 1: 406. 1859; Hook. f., Fl. Brit. India 5: 415. 1887; Gamble, Fl. Pres. Madras 1330(930). 1925; Rani & Balakr., J. Econ. Tax. Bot. 31: 96. 2007; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 126. 2007. *Acalypha racemosa* Wall. ex Baill., Etud. Gen. Euphorb. 443. 1858, nom. nud.; Manilal & Sivar., Fl. Calicut 270. 1982; Ansari, Fl. Kasaragod Div. 331. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 407. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 689. 2009.

Erect herbs to 1 m tall; branchlets minutely pubescent. Leaves simple, alternate, 4-8 x 2-5 cm, broadly ovate, apex acuminate, base rounded or subcordate, margin crenate-serrate, sparsely hispid, membranous, basally 3-(5) nerved; petiole to 7 cm long. Flowers monoecious. Male flowers in slender axillary spikes, 6-10 cm long, flowers very minute; tepals 4; stamens 8 on a convex receptacle, anthers linear. Female flowers in terminal panicles; bracts minute, ovate; tepals 3-6; ovary 3-lobed, 3-locular; ovule 1-per locule; styles filiform in 3 groups of 3 each. Capsules 1.5-2 mm across, with 3 cocci; seeds globose.

55 Block, *KJD 25412*

Fl. & Fr.: August-December

Distribution: Fairly common in Semi-evergreen forests.

ACTEPHILA Blume, Bijdr. 581. 1826

Actephila excelsa (Dalz.) Muell.-Arg., Linnaea 32: 78. 1863; Gamble, Fl. Pres. Madras 1283(898). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 397. 2007. *Anomospermum exsulsum* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 228. 1851. *Actephila neilgherrensis* Wight, Ic. t. 1910. 1852.

Large shrubs to small trees; young stem, bracts and calyx lobes hispid without. Leaves simple, opposite, 7-20 x 2-5 cm, lanceolate to oblanceolate, acute at apex, attenuate at base; petioles 0.5-1 cm long. Flowers in axillary clusters; male many, short-pedicelled; female 1-2, long-pedicelled. Male flowers: pedicels 0.3-0.4 cm long; calyx lobes 5, hairy without; petals 5, smaller than calyx, white; disc lobed; stamens 3-6, attached on the disc, filaments united to form a gonophore; pistillode within gonophore. Female flowers: pedicel 1-1.3 cm long; ovary ovoid, 0.4-0.5 cm long, 0.3-0.4 cm across, 3-celled; ovules 2 in each cell; styles 3, each again 2-fid to form 6-stigmatic lobes, lobes papillate. Capsule depressed globose, 2-2.5 cm across, 6-lobed.

Kattikkari, *NS & KVB 31339*

Fl. & Fr.: April-May

Distribution: Rare in Evergreen forests of Kattikkari.

AGROSTISTACHYS Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 41. 1850.

- 1a. Leaves entire; female flowers in racemes *A. borneensis*
1b. Leaves serrate; female flowers solitary or 2-3 together *A. indica*

Agrostistachys borneensis Becc., Nelle For. Borneo 331. 1902; Ramach. & V.J. Nair, Fl. Cannanore Dist. 407. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 718. 2009. *Agrostistachys longifolia* (Wight) Trimen, Syst. Cat. Fl. Pl. Ceylon 81. 1885, nom. illeg.; Hook. f., Fl. Brit. India 5: 407. 1887. *Sarcoclinium longifolium* Wight, Ic. tt. 1887, 1888. 1852. *Agrostistachys meeboldii* Pax & Hoffm. in Engl., Pflanzenr., Euphorb.-Chrozoph. 100. 1912; Gamble, Fl. Pres. Madras 1318(922). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 158. 2007.

Dioecious evergreen trees to 15 m; bark 8-10 mm thick, blackish-grey mottled with white, smooth, brittle; branchlets stout, marked with the scars of petioles and stipules; exudation white, milky; young parts glabrous. Leaves simple, alternate, clustered at the tips of branchlets, 10-25 x 5-7.5 cm, oblanceolate or obovate-spathulate, apex acuminate, base long attenuate, margin entire, recurved, glabrous, coriaceous; stipules lateral, short, broad, acute, cauducous; petiole 5-10 mm long, stout, glabrous; lateral nerves 10-18 pairs, pinnate, prominent. Male flowers: in axillary lax spiciform racemes, much shorter than the leaves, few flowers per bract; bracts broadly ovate, ciliate; tepals 8-10, biseriate, outer tepals connate, cupular, splitting into 2-5 valvate segments; inner tepals petaloid, alternating with outer, ovate, obtuse, fleshy, fimbriate; disc glands 5, large, alternating with inner tepals; stamens 10, exserted; outer 5 alternating with disc; inner 5 shortly connate, around pistillode; anthers versatile, the cells pendulous from the thickened connective; pistillode 2-3 clefted. Female flowers: in axillary lax spiciform racemes much shorter than the leaves, solitary in each bract; bracts broadly ovate, ciliate; tepals 8-10, biseriate, outer tepals ovate, stiff, spreading; inner tepals petaloid, longer than the outer tepals, alternating with outer, entire; disc glands 5, partly connate; ovary superior, pubescent, 3-celled, ovules 1 in each cell, laterally pendulous; styles thick, short, spreading. Fruit a capsule 7-15 mm across, 3-lobed, cocci globose, reddish, crustaceous, smooth; seeds globose, smooth, shining.

Kattikkari, *KJD 31553*

Fl. & Fr.: December-April

Distribution: Rare in Evergreen forests of Kattikkari.

Agrostistachys indica Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 41. 1850; Hook. f., Fl. Brit. India 5: 406. 1887; Gamble, Fl. Pres. Madras 1317(921). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 157. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 718. 2009.

Large shrubs to small trees. Leaves simple, subopposite to alternate, to 21 x 9 cm, elliptic-oblong, acute, coriaceous, base attenuate, spineus serrate; nerves ca. 13 pairs, regular, prominent, nervules parallel; petiole 1 cm long. Male flowers in short axillary racemes; bracts broadly ovate, densely tomentose; outer tepals white, 4 x 2.5 mm, obovate, obtuse; inner petaloid smaller than outer, white; stamens 12, filaments united at base. Female flowers solitary or 2-3 together, axillary; bracts many, 3 x 3 mm, imbricating, ciliate; pedicel 7 mm long, stout; inner tepals oblong, densely hairy. Capsule 15 mm across, cocci minutely hispid; seeds globose, glabrous.

Kattikkari, *KVB 31620*

Fl. & Fr.: February-March

Distribution: Common in Evergreen forests of Kattikkari, Mullenpara and Asthipara. Endemic to Central and Peninsular India

ANTIDESMA L., Sp. Pl. 1027. 1753.

- 1a. Stamens 2 *A. acidum*
1b. Stamens 3-5 2
2a. Female flowers sessile, closely arranged *A. alexiteria*
2b. Female flowers pedicelled, distantly arranged *A. montanum*

Antidesma acidum Retz., Obs. Bot. 5: 30. 1788; Ramach. & V.J. Nair, Fl. Cannanore Dist. 408. 1988; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 24: 8. 2000; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 303. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 719. 2009. *Stilago diandra* Roxb., Pl. Corom. 2: 35, t. 166. 1802 & Fl. Ind. 3: 759. 1832. *Antidesma diandrum* (Roxb.) Spreng., Syst. Veg. 1: 826.1825; Hook. f., Fl. Brit. India 5: 361. 1887; Gamble, Fl. Pres. Madras 1298(908). 1925. *Stilago lanceolaria* Roxb., Fl. Ind. 3: 760. 1832. *Antidesma lanceolarium* (Roxb.) Wall. ex Wight, Ic. t. 766. 1844.

Large shrubs; young stem, petioles and leaf below villous with curled hairs. Leaves simple, alteranate, 3-9 x 2-4 cm, elliptic or obovate, base attenuate, apex shortly acuminate; petiole to 3 mm long. Spikes terminal, single or 2-branched, 2.5-3 cm long. Tepals greenish-yellow; lobes 4, c. 1.5 mm long, brown hairy within. In male flowers stamens 2, attached in depressions on the disc. In female flowers ovary obovoid, 1-loculed; ovules 2. Drupe 4-6 mm across, globose.

Paripode, *KJD 22560*

Fl. & Fr.: July-September

Distribution: Rare in Semi-evergreen forests of Paripode.

Antidesma alexiteria L., Sp. Pl. 1027. 1753, Hook. f., Fl. Brit. India 5:359.1887; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 24:11.2000; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 304. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 720. 2009. *Antidesma zeylanicum* Lam., Tabl. Encycl. 1: 207. 1792; Gamble, Fl. Pres. Madras 1297(908). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 409. 1988; Anil Kumar et al., Fl. Pathanamthitta 436. 2005.

Trees, to 8 m high, bark pale brown, thin, smooth; branchlets pale to dark brown, glabrous, sparsely ferruginous-puberulous when young. Leaves simple, alternate, 3.5-15 x 1.5-4.5 cm, elliptic, elliptic-lanceolate, elliptic-oblong or elliptic-obovate, apex acuminate, base acute or rarely round, chartaceous; stipules lateral, 2-2.5 mm long, subulate or triangular-acuminate, cauducous; petiole 1.5-5 mm long, slender, grooved above, glabrous; lateral nerves 5-12 pairs, pinnate, slender, prominent, intercostae reticulate, faint. Male flowers: 2-3 together in terminal and axillary, lax flowered, scattered ferruginous, rufous or yellow puberulous or pilose spikes, perianth 0.5-x 1.5 mm, cupular, scattered pilose outside, lobes 4-5, orbicular to deltoid; disc thick, button like; stamens 3, inserted in the excavation of the disc; anther cells orbicular. Female flowers: 1-2 together in terminal and axillary scattered brown or ferruginous puberulous spikes; perianth cupular, 0.7 x 1 mm, sparsely puberulous; lobes 4, shallow, triangular or deltoid; ovary superior, ovoid, 1 mm long, glabrous, 1-[2] loculed, ovule 2 in each cell; style stout, bifid, terminal. Fruit a drupe, 4-6 x 3-5 mm, flattened, suborbicular or lenticellate or broadly obliquely ellipsoid, irregularly or alveolate, glabrous, often with white pustules, red when ripe.

Ambalappara, *NS & KJD 25554; NS & KVB 31411; KVB 31654*

Fl. & Fr.: March-May

Distribution: Common in Evergreen forests of Ambalappara and Pothururumi.

Antidesma montanum Blume, Bijdr. 1124. 1826; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 24: 26. 2000; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 305. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 720. 2009. *Antidesma pubescens* Roxb. var. *menasu* Tul., Ann. Sci. Nat. Bot. ser. 3, 15: 215. 1851. *Antidesma acuminatum* Wight, Ic. t. 1991. 1853; Hook. f., Fl. Brit. India 5: 363. 1887. *Antidesma moritzii* (Tul.) Muell.-Arg., Linnaea 34: 67. 1865 & in DC., Prodr. 15: 252. 1866; Hook. f., Fl. Brit. India 5: 362. 1887. *Antidesma refractum* Muell.-Arg. in DC., Prodr. 15: 257. 1866. *Antidesma smile* Muell.-Arg. in DC., Prodr. 15: 259. 1866. *Antidesma menasu* (Tul.) Miq. ex Muell.-Arg. in DC., Prodr. 15:257. 1866p.p., Hook. f., Fl. Brit. India 5: 364. 1887p.p.; Gamble, Fl. Pres. Madras 1297(908). 1925; Manilal & Sivar., Fl. Calicut 272. 1982; Ansari, Fl. Kasaragod Div. 332. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 408. 1988. *Antidesma menasu* (Tul.) Miq. ex Muell.-Arg. var. *linearifolia* Hook.f., Fl. Brit. India 5: 364. 1887. *Antidesma montanum* Blume var. *microcarpum* Airy Shaw, Kew Bull. 36: 263. 1981.

Trees, to 15 m high, bark brown, vertically shallowly grooved; branchlets yellow, brown, greyish-white tomentose to sparsely pubescent, becoming glabrous in age. Leaves simple, alternate, 6-30 x 2-10 cm, oblong, elliptic-oblong, ovate-oblong or elliptic-lanceolate, apex acuminate or caudate-acuminate, base acute, obtuse to round or often oblique, margin entire, often glossy above and or beneath, glabrous or puberulous or pilose on midrib above, glabrous or tomentose to sparsely puberulous on midrib beneath, chartaceous to thinly coriaceous; stipules lateral, 3-12 x 0.5-3 mm, linear, lanceolate or subulate, puberulous or glabrous, deciduous; petiole 3-10 mm, slender, tomentose to glabrous; lateral nerves 4-12 pairs, pinnate, slender, prominent, intercostae reticulate, faint. Male flowers: in axillary and terminal simple or paniculate racemes; peduncle puberulous; bracts linear, lanceolate, triangular or oblong; pedicels 0.5-2 mm long, slender, glabrous; perianth cupular 0.6 x 1-1.5 mm, glabrescent; lobes 3-4, triangular, deltoid or ovate, deep; disc 3-4 lobed; stamens 3-4; filaments inserted on the excavations of the disc; pistillode knob like or capitate. Female flowers: in terminal and axillary, simple or one to few branched racemes; peduncle whitish, yellow or tawny tomentose to glabrous; bracts linear, lanceolate or deltoid; pedicel 0.5-3 mm long, tomentolous to glabrous; perianth cupular, ca.1 x 1-2 mm, sparsely puberulous to glabrous; lobes 4-5, deep, triangular, deltoid or suborbicular; ovary superior, 1-1.8 mm long, ovoid or subglobose, glabrous, 1-[2] locular, ovules 2 in each cell; styles terminal. Fruit a drupe 3-6 x 2.5-4 mm, ellipsoid to ovoid or sometimes rhomboid-ellipsoid or rarely ovoid-pyriform, not compressed, glabrous, alveolate or ribbed.

Pothanplavu, NS & KVB 31387

Fl. & Fr.: January-December

Distribution: Fairly common in Deciduous forests of Pothanplavu; Evergreen forest of Chavachi, Moonamthode and Pothurumi.

APORUSA Blume, Bijdr. 514. 1824.

- 1a. Male spike to 5 cm long; lateral nerves 7-9 pairs *A. cardiosperma*
1b. Male spikes to 2.5 cm long; lateral nerves 5 or 6 pairs *A. fusiformis*

Aporosa cardiosperma (Gaertn.) Merr., J. Arnold Arbor. 35: 139. 1954; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 310. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 722. 2009. *Croton cardiospermus* Gaertn., Fruct. Sem. Pl. 2: 120. 1790. *Scepa lindleyana* Wight, Ic. t. 361. 1840. *Aporosa lindleyana* (Wight) Baill., Etud. Gen. Euphorb. 645. 1858; Hook. f., Fl. Brit. India 5: 349. 1887; Gamble, Fl. Pres. Madras 1309(916). 1925; Manilal & Sivar., Fl. Calicut 260. 1982; Ansari, Fl. Kasaragod Div. 333. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 409. 1988; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 17: 164. 1993.

Evergreen trees, to 15 m high; bark 6-8 mm thick, greyish-brown, vertical striations shallow, brittle; branchlets terete, glabrous. Leaves simple, attenuate, bifarious, 7.5-18 x 3-8 cm, elliptic-oblong, elliptic, oblong or ovate-oblong, base acute, obtuse or round, apex acuminate or obtusely acuminate, margin entire, glabrous, coriaceous; stipules lateral, lanceolate, cauducous; petiole 10-20 mm long, stout, grooved above, glabrous; lateral nerves 7-10 pairs, pinnate, prominent, intercostae reticulate, faint. Male flowers: yellow, solitary or clustered in axillary spikes of 1-3.5 cm long; bracts ovate, ciliate, flowers 1-3 in each bract; tepals 4, ovate, ciliate; stamens 2-3, from the centre of the flower; filaments free; anthers didymous. Female flowers: pale green, 3-8 together, in densely tomentose small racemes; pedicellate; bracts concave, ciliate, imbricate; tepals 4, larger than males; ovary superior, flask-shaped, thinly hispid; 2-celled, ovules 2 in each cell; styles 2-3, connate into a column; stigmas 2, small, plumose, spreading, recurved. Fruit a capsule 10-12 mm across, globose, yellow, glabrous, pointed with the style; aril orange-yellow; seed one, brown, planoconvex.

Kariyenkappu, NS & KJD 31996

Fl. & Fr.: December-June

Distribution: Fairly common in Plantations of Kariyenkappu; Evergreen forests of Moonamthode and Deciduous forests of Paripode.

Aporosa fusiformis Thw., Enum. Pl. Zeyl. 288. 1861; Hook. f., Fl. Brit. India 5: 351. 1887; Gamble, Fl. Pres. Madras 1309(916). 1925; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 17: 160. 1993; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 310. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 722. 2009.

Trees, to 8 m high; bark brown, smooth; branchlets terete, brown to greyish glabrous. Leaves simple alternate, 3-18 x 1.5-8 cm, obovate, suborbicular or broadly elliptic, apex apiculate or obtuse, round or retuse, base cuneate, acute, round or obtuse, entire and often minutely glandular-notched along margins, glabrous, often glossy above, coriaceous; stipule 6 mm long, lateral, falcate; petiole 5-25 mm long, slender, grooved above, glabrous; lateral nerves 4-7 pairs, pinnate, slender, prominent, intercostae reticulate, faint. Male flowers: in 1-3 cm long axillary, dense flowered, catkin-like spikes; bracts 0.3-2 x 0.5-3.5 mm, broadly ovate, ciliate; tepals 4-5, 1-1.2 x 0.4-0.6 mm, triangular to oblong, acute, shortly connate; stamens 2-3, 2.5-3 mm long; filaments free; anthers suborbicular, didymous. Female flowers: in axillary few flowered fascicles of 3 cm long; tepals 4, ca. 1.5 x 1.5 mm, suborbicular, ciliate, deciduous; ovary superior, ovoid-ellipsoid, densely tawny-puberulous, soon glabrous, 2-locular; ovules 2 in each cell; style 2, 3-3.5 mm long; column 1-1.5 mm long; stigma 2-lobed, coarsely plumose. Fruit a capsule 12-15 x 8-10 mm, ellipsoid or fusiform, glabrous, thin walled or sometimes slightly fleshy; seeds 1 or 2.

Chavachi, KVB 31798

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Chavachi and Semi-evergreen forests of Paripode.

BACCAUREA Lour., Fl. Cochinch. 2: 651. 1790.

Baccaurea courtallensis (Wight) Muell.-Arg. in DC., Prodr. 15: 459. 1866; Hook. f., Fl. Brit. India 5: 367. 1887; Gamble, Fl. Pres. Madras 1310(916). 1925; Manilal & Sivar., Fl. Calicut 260. 1982; Ansari, Fl. Kasaragod Div. 333. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 409. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 313. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 722. 2009. *Pierardia courtallensis* Wight, Ic. t. 1912. 1852. *Baccaurea sapida* Bedd., Fl. Sylv. t. 280. 1872.

Evergreen trees to 15 m high; bole uneven with tubercles; bark greyish-yellow,; branchlets terete, rough. Leaves simple, alternate, often clustered towards the tip of branchlets, 5.5-30 x 1.5-8.5 cm, oblanceolate or elliptic-oblanceolate, apex acuminate or caudate-acuminate, base acute, attenuate or cuneate, margin entire, membranous to chartaceous, scattered white furfuraceous above and beneath, often scattered puberulous on midrib beneath; stipules 3-5 mm long, lateral, lanceolate, cauducous; petiole 10-60 mm long, slender, grooved above, glabrescent or puberulous; lateral nerves 4-7 pairs, pinnate, slender, faint, intercostae reticulate, obscure. Flowers unisexual, dark crimson, in densely clustered slender racemes on mature stem. Male flowers: bracts lanceolate, linear-lanceolate or triangular, free, conduplicate, encircling the base of lateral branches; tepals 4-5, 1.5-2 x 1 mm, linear, oblong, elliptic, suborbicular or oblanceolate, glabrous or sparsely puberulous; stamens 4-8, free; anthers basifixed; pistillode clavate. Female flowers: bracts 1-1.5 mm long, lanceolate; tepals 4-5, 2.5-3 x 0.6-1.5 mm, linear, oblong or oblong-elliptic, sparsely puberulous to glabrous, ciliate; ovary superior, 2.5 x 2-3 mm, ovoid or subglobose, 3-locular, ovules 2 in each cell, 3-angled, tomentose; stigmas 3, flabellate. Fruit a capsule, 1.5-3 x 1.5-2.5 cm, subglobose, ovoid, ellipsoid or obovoid, 3 locular, thick walled, often with 6 longitudinal ribs, pink-red when ripe, brown when dry, often verrucose, pubescent, dehiscent; seeds 3, oblong, aril white.

Chavachi, *KJD* 26325

Fl. & Fr.: January-July

Distribution: Common in Evergreen forests of Chavachi, Kattikkari, Kurumbankallu and Meenmutty; Semi-evergreen forests of Pothanplavu. Endemic to Peninsular India.

BALIOSPERMUM Blume, Bijdr. 603. 1826.

Baliospermum montanum (Willd.) Muell.-Arg. in DC., Prodr. 15: 1125. 1866; Gamble, Fl. Pres. Madras 1342(939). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 410. 1988; Chakrab. & Balakr., Bull. Bot. Surv. India 32: 5. 1990; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 195. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 723. 2009. *Jatropha montana* Willd., Sp. Pl. 4: 565. 1805. *Baliospermum solanifolium* (Geisl.) Suresh in Nicolson et al., Interp. Hort. Malab. 106. 1988; Sivar. & Mathew, Fl. Nilambur 607. 1997. *Croton solanifolius* Geisl., Croton Monogr. 74. 1807. *Baliospermum axillare* Blume, Bijdr. 604. 1826; Hook. f., Fl. Brit. India 5: 461. 1887. *Baliospermum polyandrum* Wight, Ic. t. 1885. 1852.

Subshrubs. Leaves simple, alternate, 10-15 x 6-10 cm, broadly ovate, often 3-lobed, apex acute or acuminate, base rounded, 3-5 ribbed, glabrous or

sparsely hispid above and tomentose along the nerves beneath, inciso-crenate, with a pair of glands at base of lamina; petiole to 6 cm long. Perianth lobes 4, concave, 1.5 mm long, pubescent. Stamens numerous on a central receptacle; filaments slender, connective broad. Ovary densely tomentose, style 2-fid. Capsule 3-lobed, 1.2 cm long; seeds ovoid, caruncled.

Pottichapara, *KJD 18740*

Fl. & Fr.: August-March

Distribution: Rare in Evergreen forests of Pottichapara.

Bischofia javanica Blume, Bijdr. 1169. 1826; Hook. f., Fl. Brit. India 5: 345. 1887; Gamble, Fl. Pres. Madras 1312c. 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 410. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 315. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 723. 2009.

Deciduous trees, to 30 m high; bark brown, thin, scaly; exudation red, watery; branches spreading. Leaves 3-foliolate, alternate, 5.5-18 x 3-9 cm, elliptic, elliptic-ovate, ovate, obovate or orbicular, base acute or round, apex acuminate, margin serrate, glabrous, membranous; stipules lateral, cauducous; rachis 7-20 cm long, stout, grooved above, glabrous; petiolule of lateral leaflets 3-20 mm long, of terminal leaflet 15-40 mm long, slender, glabrous; lateral nerves 6-9 pairs, slender, prominent, intercostae reticulate, faint. Flowers unisexual, green, in axillary and lateral peduncled paniculate racemes. Male flowers: 2-3 mm across; pedicels very short, slender; tepals 5, obovate, concave, imbricate, concealing the anthers; stamens 5, filaments short; anthers globular; pistillode short, broad. Female flowers: 2-35 mm across; pedicels longer than in the male, stout, elongating in fruit; tepals 5, linear lanceolate; ovary superior, globose, 3-celled, exserted, ovules 2, in each cell; style 3, linear; stigmatic through out on the inner face. Fruit a berry, globose 7 mm across, reddish-brown; seeds 3, trigonus.

Ambalappara, *KJD 18742*

Fl. & Fr.: March-October

Distribution: Rare in Evergreen forests of Ambalappara.

BLACHIA Baillon, Etud. Gen. Euph. 388. t. 19. 1858, *nom. cons.*

Blachia umbellata (Willd.) Baill., Etud. Gen. Euphorb. 387. t.19. 1858; Hook. f., Fl. Brit. India 5: 402. 1887; Gamble, Fl. Pres. Madras 1338(936). 1925; Ansari, Fl. Kasaragod Div. 334. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 410. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 202. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 724. 2009. *Croton umbellatus* Willd., Sp. Pl. 4: 545. 1805. *Blachia reflexa* Benth., J. Linn. Soc. Bot. 17: 226. 1880; Hook. f., Fl. Brit. India 5: 402. 1887; Gamble, Fl. Pres. Madras 1338(936). 1925.

Glabrous shrubs; branchlets slender. Leaves simple, alternate, to 5 x 5 cm, elliptic, acuminate at apex, base acute; lateral nerves 10-13 pairs, irregular, looping; petiole 1 cm long. Male flowers 5 mm across, 5-10 together in a terminal umbel; pedicel 1.5 cm long; sepals 2.5 x 2 mm, ovate, acute, glabrous; stamens 15-20. Female flowers 8 mm across; 3-5, on stout peduncle, sepals 5, 4 x 2 mm, oblong, acute, glabrous; ovary glabrous; styles 3, 8 mm long, bifid. Capsule 18 mm across, 3-lobed, glabrous.

Moonamthode, *NS & KVB 31357*

Fl. & Fr.: October-April

Distribution: Common in Evergreen forests of Moonamthode, Kattikkari and Chavachi.

BREYNIA J. R. Forster & G. Forster, Charact. Gen. 145. 1776, *nom. cons.*

1a. Fruit globose to 1.5 cm across, fruiting perianth much enlarged..... *B. retusa*

1b. Fruit to 0.7 cm across, fruiting perianth not enlarged *B. vitis-idaea*

Breynia retusa (Dennst.) Alston, Ann. Roy. Bot. Gard. (Peradeniya) 11: 204. 1929; Ansari, Fl. Kasaragod Div. 334. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 411. 1988; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 505. 1996; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 340. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 725. 2009. *Phyllanthus retusus* Dennst., Schluss. Hort. Malab. 24. 1818. *Breynia patens* (Roxb.) Rolfe, J. Bot. 11: 359. 1882; Hook. f., Fl. Brit. India 5: 329. 1887; Gamble, Fl. Pres. Madras 1304(912). 1925. *Phyllanthus patens* Roxb., Fl. Ind. 3: 667. 1832. *Melanthesa turbinata* Wight, Ic. t. 1897. 1852.

Shrubs, 1-1.5 m high. Leaves simple, alternate, 1.3-2.5 x 0.7-1.3 cm, broadly elliptic or ovate, apex obtuse, base rounded or acute, glaucous below, black on drying; petiole to 2 mm long. Flowers unisexual, solitary, axillary. Male flowers 3 mm across; pedicels 1 mm long; perianth turbinate, 3-4 mm long, truncate; lobes 5-6; stamens 3. Female flowers 5-6 mm across; pedicels 3-4 mm; perianth campanulate, 3-4 mm long, 5-6-lobed; ovary globose; stigma bifid. Capsule 1.2-1.5 cm across, depressed globose, orange-red on ripening, subtended by the enlarged fruiting perianth.

Chavachi, *KJD 26367*

Fl. & Fr.: February-September

Distribution: Fairly common in Evergreen forests of Chavachi and Meenmutty.

Breynia vitis-idaea (Burm. f.) C.E.C. Fisch., Bull. Misc. Inform. Kew 1932: 65. 1932; Manilal & Sivar., Fl. Calicut 271. 1982; Ansari, Fl. Kasaragod Div. 335. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 411. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 340. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 725. 2009. *Rhamnus vitis-idaea* Burm. f., Fl. Ind. 61. 1768. *Breynia rhamnoides* (Retz.) Muell.-Arg. in DC., Prodr. 15:440. 1866; Hook. f., Fl. Brit. India 5: 330. 1887; Gamble, Fl. Pres. Madras 1304(912). 1925. *Phyllanthus rhamnoides* Retz., Obs. Bot. 5: 30. 1788. *Melanthesa rhamnoides* (Retz.) Wight, Ic. t. 1898, fig. 1. 1852.

Large shrubs. Leaves simple, alternate, 2-3 x 1.5-2.5 cm, ovate or elliptic, apex acute, base acute or obtuse, glabrous, dark brown above and lighter below on drying; petiole to 2 mm long. Male flowers in axillary fascicles of 2-5; pedicels 3-5 mm long; perianth turbinate, yellow, lobes 5; stamens 3. Female flowers axillary, solitary, reddish, c. 1.5 mm across; perianth campanulate, 5-6-lobed; ovary 3-celled; style short; stigmas 3, sunk at top of ovary. Fruit 3-4 mm across; globose, red on ripening, changes to purple.

Paripode, *KJD 18747*

Fl. & Fr.: February-August

Distribution: Rare in Semi-evergreen forests of Paripode.

BRIDELIA Willdenow, Sp. Pl. 4(2): 978. 1806.

1a. Trees; flowers in terminal paniculate spikes*B. retusa*

1b. Scandent shrubs; flowers in axillary fascicles *B. stipularis*

Briedelia retusa (L.) A. Juss., Euphorb. Gen. 109. 1824; Hook. f., Fl. Brit. India 5: 268. 1887p.p.; Gamble, Fl. Pres. Madras 1280(896). 1925; Manilal & Sivar., Fl. Calicut 273. 1982; Ansari, Fl. Kasaragod Div. 335. 1985; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 319. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 726. 2009. *Clutia retusa* L., Sp. Pl. 1475. 1753. *Briedelia spinosa* (Roxb.) Willd., Sp. Pl. 4:979.1806. *Briedelia crenulata* Roxb., Fl. Ind. 3: 734. 1832; Sasidh., Fl. Chinnar WLS 280. 1999. *Briedelia roxburghiana* (Muell.-Arg.) Gehrm., Bot. Jahrb. Syst. 41. 95: 30. 1908; Gamble, Fl. Pres. Madras 1280(896). 1925; Manilal & Sivar., Fl. Calicut 273. 1982. *Briedelia airy-shawii* P. T. Li, Acta Phyt. Sin. 20: 117. 1982, nom. illeg.; Sasidh., Fl. Periyar Tiger Reserve 366. 1998.

Deciduous trees, to 20 m high, bark greyish-brown; young trees armed with sharp thorns; branchlets thinly hairy. Leaves simple, alternate, 5-22 x 3-11 cm, broadly elliptic, oblong, elliptic-oblong, obovate or obovate-oblong, apex obtuse retuse or subacute, base round, obtuse, truncate, cordate or acute, margin entire or slightly crenulate, bright green and glabrous above (turning pinkish-brown before falling), glaucous and usually finely tomentose beneath, coriaceous; stipules 7 mm long, lateral, lanceolate, deciduous; petiole 9-15 mm long, stout, pubescent when young; lateral nerves 14-25 pairs, parallel, prominent, dichotomously forked near the margin, intercostae scalariform, prominent. Flowers unisexual; greenish-yellow, sessile or shortly pedicellate, crowded in dense axillary or terminal, some times paniculate spikes often exceeding the leaves; bracts scaly. Male flowers: 7 mm across, tepals 10, biseriate, valvate; outer tepals 3 mm long, ovate-lanceolate, thick, truncate, shortly connate, acute, inner ones 2 mm, obovate, cuneate, obtuse, fimbriate; stamens 5, monadelphous, born on a gonophore, exserted; filaments 0.7 mm, anthers oblong; pistillode bifurcate; disc annular. Female flowers: 6.5 mm across, tepals 10, biseriate, lanceolate, valvate; outer and inner 2.5 and 1.5 mm long, coriaceous, puberulous without, truncate, shortly connate, fimbriate, acute; ovary half inferior, globose, 2 x 1 mm, 2-locular, ovules 2 in each cell; styles 2, forked, 2 mm; stigmatiferous; disc with an inner, membranous, fimbriate corona enclosing basal part of ovary. Fruit a drupe, 7-8 mm across, purplish-black, seated on the persistent, slightly enlarged calyx, pyrenes 2, epicarp crustaceous; seed one in each pyrene.

Kariyenkappu, KJD 22597

Fl. & Fr.: August-December

Distribution: Rare in Plantations of Kariyenkappu; Semi-evergreen forests of Narikkadavu and Pothanplavu.

Briedelia stipularis (L.) Blume, Bijdr. 597. 1825; Hook. f., Fl. Brit. India 5: 270. 1887; Gamble, Fl. Pres. Madras 1281(896). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 412. 1988; Chakrabarty et al., Journ. Econ. Tax. Bot. 26: 324. 2002; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 320. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 726. 2009. *Clutia stipularis* L., Mant. Pl. 1: 127. 1767. *Clutia scandens* Roxb., Pl. Corom. t. 173. 1802. *Briedelia scandens* (Roxb.) Willd., Sp. Pl. 4: 979. 1805; Gamble, Fl. Pres. Madras 1281(896). 1925; Manilal & Sivar., Fl. Calicut 273. 1982; Ansari, Fl. Kasaragod Div. 335. 1985; Sunil & Sivadasan, Fl. Alappuzha Dist. 623. 2009.

Scandent shrubs with spines on older stem; branchlets brown tomentose. Leaves simple, alternate, 4-8 x 2-6 cm, elliptic-oblong, apex obtuse, base subcordate or rounded, minutely tomentose below, those of flowering branches much smaller; petiole c. 5 mm long. Flowers greenish-yellow, sessile, in axillary fascicles. Male flowers 2-3 mm across. Female flowers 4-5 mm across. Tepals 10,

biseriate, ovate-acute, densely tomentose without. Stamens 5, monadelphous. Drupe 5-6 mm across, globose, black, calyx persistent.

Kariyenkappu, *KJD 26076*

Fl. & Fr.: December-February

Distribution: Fairly common in Plantations of Kariyenkappu and Evergreen forests of Chavachi. Endemic to Peninsular India.

CROTON L., Sp. Pl. 1004. 1753.

- 1a. Herbs, covered with yellow viscid glands *C. bonplandianus*
1b. Shrubs or small trees, without yellow viscid glands 2
2a. Leaves silvery white beneath *C. malabaricus*
2b. Leaves not silvery white beneath *C. klotzschianus*

Croton bonplandianus Baill., *Adansonia* 4: 339. 1864; Manilal & Sivar., *Fl. Calicut* 266. 1982; Ansari, *Fl. Kasaragod Div.* 336. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 412. 1988; N.P. Balakr. & Chakrab., *Fam. Euphorbiaceae India* 212. 2007; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 731. 2009. *Croton sparsiflorus* Morong. in *Ann. New York Acad. Sci.* 7: 221. 1893; Gamble, *Fl. Pres. Madras* 1316(920). 1925.

Herbs, young parts stellate-pubescent and viscous glandular. Leaves simple, alternate, 2-5 x 1-2 cm, ovate-lanceolate, apex gradually acute, base attenuate, margin faintly serrulate, densely stellate scaly on both sides when young, sparsely so below and glabrous above on ageing; petiole to 1.5 cm long. Racemes to 10 cm long; pedicels glandular on either side. Male flowers 3-4 mm across; perianth 2-seriate, greenish-white, outer c. 1 mm long, inner c. 2 mm long; stamens many. Female flowers few, towards base, 2.5-3 mm across; perianth 1-seriate, lobes 5; ovary subglobose, tomentose; style short; stigma 3, each forked to form 6 lobes. Capsule 5-6 mm across, ovoid, warty; seeds 3, globose, carunculate.

Paripode, *KJD 18785*

Fl. & Fr.: November-May

Distribution: Boundaries of Farm.

Croton klotzschianus Thw., *Enum. Pl. Zeyl.* 276. 1861; Hook. f., *Fl. Brit. India* 5:392.1886; Gamble, *Fl. Pres. Madras* 1315(920).1925; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 413. 1988; N.P. Balakr. & Chakrab., *Fam. Euphorbiaceae India* 214. 2007. *Oxydectes klotzschianus* (Thw.) Kuntze, *Revis. Gen. Pl.* 2: 612. 1891. *Croton thwaitesianus* Muel.-Arg., *Linnaea* 34: 116. 1865.

Shrubs, often straggling. Leaves simple, alternate, 7-9 x 2.5-4 cm, elliptic-ovate or oblong, base and apex acute, margin serrulate, membranous; 3-ribbed from the base, stellately hairy when young; petiole to 1 cm long. Racemes 3-6 cm long. Male flowers many for most of the parts of the raceme, pedicel to 1 cm long; tepals gland-dotted; stamens many; disc-glands 5, large. Female flowers a few at the base of the racemes, pedicel short, outer tepals ovate, inner ones subulate. Ovary densely stellately hairy. Capsule subglobose.

Kattikkari, *KVB 31558*; Pothurumi, *KVB 31625*

Fl. & Fr.: February-April

Distribution: Fairly common in Evergreen forests of Chavachi, Kattikkari and Pothurumi.

Croton malabaricus Bedd., Fl. Sylv. 204. 1873; Hook. f., Fl. Brit. India 5: 386. 1887; Gamble, Fl. Pres. Madras 1314(919). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 214. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 732. 2009.

Trees, to 20 m high, bark greyish-white, smooth; branchlets stellate-hairy. Leaves simple, alternate, 7-24 x 3-12 cm, rhombic-ovate, broadly ovate or elliptic, apex acuminate, base cuneate, obtuse or round, margin entire, glabrous or with silvery stellate hairs and reddish glands beneath, chartaceous; stipules 12-18 mm long, lateral, filiform, scarious; petiole 10-12.5 mm long, slender, stellate scales present; prominently, 3-4-ribbed from base; lateral nerves 4-6 pairs, pinnate, prominent, intercostae scalariform, obscure. Flowers unisexual, 5-10 mm across, white, in erect terminal racemes of 5-12.7 cm long; bracts small; perianth 2-seriate; 5-partite, glandular at base; sepals ovate, obtuse, silky tomentose; petals 5, smaller than sepals, obovate. Ovary stellate hairy, 3-celled, ovules one in each cell; styles long, slender, pistillode absent in males; stamens 10-15, filaments bearded. Fruit a capsule 2.5 x 2 cm, obovoid, depressed above, brown tomentose; seeds 13 x 8 mm, oblong, mottled with brown.

Way to Meenmutty, *KJD 18727*

Fl. & Fr.: April-November

Distribution: Fairly common at Semi-evergreen forest of Pothanplavu to Evergreen forest of Meenmutty. Endemic in southern Western Ghats

DIMORPHOCALYX Thwaites, Enum. Pl. Zeyl. 278. 1861.

Dimorphocalyx glabellus Thw., Enum. Pl. Zeyl. 278. 1861; Hook. f., Fl. Brit. India 5: 403. 1887; Gamble, Fl. Pres. Madras 1336(935). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 205. 2007.

Small much branched trees; branchlets nearly white. Leaves simple, alternate, 12 x 5 cm, elliptic or lanceolate, obtuse or acute, reddish brown when dry and rather thin; petiole 0.5-1 cm long. Male flowers shortly pedicelled; female long pedicelled; pedicels with few small obtuse bracts. Petals of the male longer than the sepals, of the female shorter. Stamens about 10. Ovary strigose. Capsule slightly hispid-villous, shortly lobed; seeds oblong, mottled. Fruiting calyx obovate, obtuse, with a glandular pit on back near the tip.

Kattikkari, *KJD 22598*

Fl. & Fr.: Throughout the year

Distribution: Rare in Evergreen forests of Kattikkari.

DRYPETES Vahl, Eclog. Amer. 3: 49. 1807.

- 1a. Fruit sessile; leaves remotely serrate..... *D. confertiflora*
1b. Fruit distinctly pedicelled; leaves entire 2
2a. Fruit pedicel less than 1 cm long *D. wightii*
2b. Fruit pedicel over 1.5 cm long..... *D. venusta*

Drypetes confertiflora (Hook.f.) Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Phyllanthoid.-Phyllanth. 246. 1922; Chakrab. et al., Journ. Econ. Tax. Bot. 21: 259. 1997; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 330. 2007. *Cyclostemon confertiflorus* Hook.f., Fl. Brit. India 5: 341. 1887; Gamble, Fl. Pres. Madras 1302(911). 1925.

Trees, to 25 m high; bark greyish, smooth; branchlets glabrous, brownish, terete. Leaves simple, alternate, 6-22 x 2.5-7.5 cm, oblong or elliptic-oblong,

apex obtusely acuminate, base oblique, margin entire or distantly serrate, glabrous and glossy, coriaceous; stipules lateral, small, caducous; petiole 5-12 mm long, stout, grooved above, glabrous; lateral nerves 7-10 pairs, pinnate, prominent, intercostae reticulate, prominent. Flowers unisexual, axillary but usually in clusters on old wood. Male flowers: pedicels 4-5 mm long; tepals 5-6, 4-6 × 3.5-5.5 mm, suborbicular, white, ciliate; stamens 15-20; filaments glabrous; inserted around disc; anthers oblong. Disc impressed, large, glabrous, radiately ribbed with inflexed marginal lobe. Female flowers: nearly sessile; ovary superior, brown tomentose, 2-celled, ovules 2. Fruit a drupe, 3.5-5 cm across, subglobose, somewhat flattened, pubescent, 2-locular; endocarp fleshy.

Kariyenkappu, NS & KJD 31995

Fl. & Fr.: February-May

Distribution: Rare in Plantations of Kariyenkappu, Semi-evergreen forests of Chulikandam, Pothanplavu and Bhoothamkallu. Endemic in southern Western Ghats; Conservation status: Vulnerable.

Drypetes venusta (Wight) Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Phyllanthoid.-Phyllanth. 268. 1922; Chakrabarty et al., Journ. Econ. Tax. Bot. 21: 277. 1997; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 334. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 735. 2009. *Astylis venusta* Wight, Ic. t. 1992. 1853. *Hemicyclia venusta* (Wight) Thw. in Hook.'s J. Bot. Kew Gard. Misc. 7: 272. 1855; Hook. f., Fl. Brit. India 5: 339. 1887; Gamble, Fl. Pres. Madras 1300(909). 1925. *Drypetes elata* (Bedd.) Pax. & Hoffm. in Engl., Pflanzenr. Euphorb.-Phyllanthoid.-Phyllanth. 268. 1922; Ramach. & V.J. Nair, Fl. Cannanore Dist. 413. 1988. *Hemicyclia elata* Bedd., Fl. Sylv. t. 279. 1872; Hook. f., Fl. Brit. India 5: 339. 1887; Gamble, Fl. Pres. Madras 1300(909). 1925.

Deciduous trees, to 30 m high, bole fluted, bark greyish-white, smooth, thin; branchlets 1-5 mm thick, slender, drooping, glabrous. Leaves simple, alternate, 6-15 x 2-6.4 cm, elliptic, elliptic-lanceolate or elliptic-oblong, apex obtusely acute, obtusely acuminate or acute, base oblique, acute, margin entire, glabrous, coriaceous; stipules small, lateral, caducous; petiole 3-20 mm long, slender, grooved above, glabrous; lateral nerves 7-15 pairs, pinnate, slender, prominent, intercostae reticulate, prominent. Flowers unisexual, greenish-yellow, 5-8 mm across. Male flowers: 3-6 in axillary clusters; pedicel 5-8 mm long, minutely hispid; tepals 4, 4 x 2 mm, oblong, obtuse, hispid outside; stamens 6-10; filaments 3 mm long, free, glabrous. anthers oblong; disc lobulate, villous. Female flowers: solitary or in pairs, axillary; pedicel minutely hispid; tepals 4, 4 x 2 mm, oblong, obtuse, hispid outside; ovary ovoid, 1-celled; stigma mushroom shaped; ovules 2, pendulous. Fruit a drupe, obovoid, 1.5-2.5 cm long, greenish-yellow, drooping; seed solitary, covered with pulpy mucilage.

Meenmutty, KVB 31273

Fl. & Fr.: November-July

Distribution: Common in Evergreen forests of Meenmutty, Moonamthode, Chelachode, Chavachi, Pothurumi, Ambalappara region, Kannadivehakunnu and; Semi-evergreen forests of Narikkadavu and Paripode. Endemic to Western Ghats

Drypetes wightii (Hook. f.) Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Phyllanthoid.-Phyllanth. 273. 1922; Chakrab. et al., Journ. Econ. Tax. Bot. 21: 277. 1997; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 334. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 735. 2009. *Hemicyclia wightii* Hook. f., Fl. Brit. India 5: 339. 1887; Gamble, Fl. Pres. Madras 1300(909). 1925.

Trees to 18 m tall; bark greyish-white, smooth; branches drooping; branchlets terete, glabrous. Leaves simple, alternate, 4-10.5 x 1.5-3.5 cm, elliptic, elliptic-oblong or elliptic-lanceolate, apex acuminate, base oblique or acute, margin entire, glabrous, coriaceous; stipules small, lateral, caducous; petiole 2-8 mm long, stout, glabrous; lateral nerves 6-9 pairs, pinnate, prominent; intercostae reticulate, prominent. Flowers unisexual, yellowish, in axillary clusters or in the axils of fallen leaves. Male flowers: pedicels 3-5 mm long, puberulous; tepals 4-5, 3 x 2-2.5 mm, broadly elliptic to suborbicular, tomentellous outside; stamens 6-10, 1-1.5 mm long; filaments free; anthers oblong; disc entire, pubescent. Female flowers: pedicels 4-5 mm long, puberulous; tepals 4-5, 3-4 x 2.5-3.5 mm, suborbicular, tomentellous outside; disc annular; ovary 2 x 1 mm, ellipsoid, 1-locular, ovules 2, sparsely puberulous to glabrous; stigma reniform. Fruit a capsule 17-20 x 15 mm, ovoid, ellipsoid or obovoid, smooth, glabrous; pedicels 10-12 mm long.

Way to Meenmutty, KJD 22599

Fl. & Fr.: October-March

Distribution: Fairly common in Deciduous forests of Pothanplavu to Evergreen forests of Meenmutty. Endemic to Western Ghats.

EPIPRINUS Griffith, Notul. Pl. Asiat. 4: 487. 1854.

Epiprinus mallotiformis (Muell.-Arg.) Croizat, J. Arnold Arbor. 23: 53. 1942; Ramach. & V.J. Nair, Fl. Cannanore Dist. 414. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 170. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 736. 2009. *Symphyllia mallotiformis* Muell.-Arg., Linnaea 34: 156. 1865; Gamble, Fl. Pres. Madras 1323(925). 1925. *Adenochlaena indica* (Bedd.) Bedd. ex Hook. f., Fl. Brit. India 5: 418. 1887. *Cephalocroton indicum* Bedd., Fl. Sylv. t. 261. 1872.

Trees, to 12 m; young shoots stellate-tomentose. Leaves simple, alternate, 7-20 x 1-8 cm, elliptic, elliptic-ovate or elliptic-obovate, apex acute or acuminate, base round, obtuse or acute, margin entire, glabrous, coriaceous; stipules 2, lateral, minute; petiole 4-20 mm long, stout, stellate-tomentose when young; lateral nerves 6-10 pairs, pinnate, prominent intercostae reticulate, prominent. Flowers unisexual, pale green, in long axillary spikes. Male flowers: densely clustered along the upper part of the raceme; tepals 4-6, ovate, acute, thinly tomentose; stamens 4-6, free, inflexed in bud; pistillode columnar. Female flowers: tepals 5-8, unequal, 2 mm, shortly connate, lanceolate, puberulous without; ovary superior, 2 mm long, globose, pubescent, 3-locular; ovules one in each cell; styles 3, stout, 3 mm, twice forked, papillose. Fruit a capsule 2.5-3 cm across, 3-lobed, lobes globular, densely stellate hairy; seeds 3, globose.

Kattikkari, NS & KJD 31905

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Kattikkari and Chavachi. Endemic to Western Ghats.

EUPHORBIA L., Sp. Pl. 450. 1753.

- 1a. Erect unbranched herbs; cyathia 20-40 together..... *E. hirta*
1b. Prostrate herbs; cyathia 1-5 together *E. thymifolia*

Euphorbia hirta L., Sp. Pl. 454. 1753; Gamble, Fl. Pres. Madras 1275(892). 1925; Manilal & Sivar., Fl. Calicut 257. 1982; Ansari, Fl. Kasaragod Div. 337. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 415. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 256. 2007. *Chamaesyce hirta* (L.) Millisp., Publ. Field Columbian Mus. Bot. Ser. 2: 303. 1909; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 727. 2009.

Slender, erect, pubescent herbs about 20-35 cm tall. Leaves decussate, 1-2.5 x 0.7-1.5 cm, broadly oblong to elliptic-lanceolate, apex acute, base obliquely truncate, margin serrulate, hispid on both sides, basally 3-nerved; petiole to 3 mm long. Cyathia aggregated in single or paired axillary clusters. Involucre minute, c. 1 mm long; glands 5, red. Male flowers 4-6, ebracteolate. Female florets laterally pendulous; styles 2-fid from base. Capsule 1.5-2 mm across, pubescent; seeds minute, red, 4-angled, minutely furrowed.

Paripode, *KJD 26251*

Fl. & Fr.: Throughout the year

Distribution: Rare along the boundaries of Farm.

Euphorbia thymifolia L., Sp. Pl. 454. 1753; Hook. f., Fl. Brit. India 5: 252. 1887; Gamble, Fl. Pres. Madras 1276(893). 1925; Manilal & Sivar., Fl. Calicut 257. 1982; Ansari, Fl. Kasaragod Div. 338. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 416. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 261. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 728. 2009. *Chamaesyce thymifolia* (L.) Millisp., Publ. Field Columbian Mus. Bot. Ser. 2: 412. 1916.

Softly hispid prostrate herbs. Leaves opposite, distichous, 2-7 x 2-4 mm, oblong or suborbicular, apex obtuse, base obliquely cordate, margin serrulate, 1-nerved, subsessile. Cyathia in axillary clusters. Involucre campanulate, c. 8 mm long; glands 4. Male flowers 1-4, ebracteolate. Female laterally pendulous; ovary tomentose; style 3-forked from base. Capsule c. 2 mm across, obtusely angled, glabrescent; seeds 4-angular, minutely tuberculate, red.

Narikkadavu, *KJD 26375*

Fl. & Fr.: November-May

Distribution: Near stream side.

EXCOECARIA L., Syst. Nat., ed. 10. 2: 1288. 1759.

Excoecaria oppositifolia Griff. **var. crenulata** (Wight) Chakrab. & Gangop., Journ. Econ. Tax. Bot. 18: 208. 1994; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 291. 2007. *Excoecaria crenulata* Wight, Ic. t. 1865. 1852; Hook. f., Fl. Brit. India 5: 473. 1888; Gamble, Fl. Pres. Madras 1345(941). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 417. 1988. *Excoecaria robusta* Hook. f., Fl. Brit. India 5: 474. 1888; Gamble, Fl. Pres. Madras 1345(941). 1925.

Trees, up to 8 m high; branchlets 3-7 mm thick, flattened or angled when young, terete when mature. Leaves simple, opposite, 8-20 x 2-4.5 cm, oblong-lanceolate, oblanceolate, elliptic or obovate, apex acuminate, apiculate or subacute, base acute or obtuse, margins shallowly crenate-serrate, dentate or entire, coriaceous, glabrous, glossy above; stipules minute, inter petiolar, 15 mm long, lanceolate; petiole 5-30 mm long, stout, grooved above, glabrous;

lateral nerves, 10-22 pairs, slender, parallel, prominent; intercostae reticulate. Flowers unisexual, yellowish-green; bracteoles with large glands on either side. Male flowers: in terminal and axillary 3.5-18 cm long spikes; bracts 1.5-2 x 0.8-2 mm, broadly ovate, deltoid, triangular, suborbicular or flabellate, denticulate to entire; tepals 3, 1-1.5 x 0.8-1.3 mm, broadly ovate, ovate-oblong or suborbicular, dentate or erose or occasionally subentire; stamens 2 or 3, 1.5-2 mm long, anthers 0.5-1 mm across, basifixed. Female flowers: in axillary or terminal 1-3 flowered clusters; bracts 1-2 x 1-2.5 mm, broadly triangular to deltoid or suborbicular, entire to erose; pedicel 1-5 mm long; tepals 3, 2-3.5 x 1.5-3 mm, broadly ovate to triangular, lanceolate to entire; ovary superior, 1.5-2 mm across, subglobose, 3-celled, ovules 1 in each cell; styles 3, 3-7 mm long, simple or occasionally shortly bifid above; basal column 1-2 mm long. Fruit a capsule 1-3 cm across, somewhat depressed, shallowly or sometimes deeply 3 lobed; seeds globose.

Mullenpara State Boundary, *KJD 26026*

Fl. & Fr.: February-April

Distribution: Fairly common in Evergreen forests of Mullenpara and Kattikkari.

FLUEGGEA Willdenow, Sp. Pl. 4: 757. 1806.

Flueggea leucopyrus Willd., Sp. Pl. 4: 757. 1806; Hook. f., Fl. Brit. India 5: 328. 1887; Gamble, Fl. Pres. Madras 1296(907). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 342. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 738. 2009. *Securinea leucopyrus* (Willd.) Muell.-Arg. in DC., Prodr. 15: 451. 1866; Sasidh., Fl. Chinnar WLS 290. 1999.

Shrubs, branchlets angular, ending in spines. Leaves distichous, to 3.5 x 2 cm, obovate, apex emarginate, base cuneate, membranous, glaucous beneath; lateral nerves ca. 5 pairs, slender. Flowers greenish-white in axillary clusters; bracts many, minute, pedicels 2 mm. Male flowers: tepals 0.7 mm, concave, obtuse; stamens 5, filaments 1.5 mm, pistillode 1 mm. Capsule 5-8 mm across, globose, white.

Paripode, *NS & KVB 31452*

Fl. & Fr.: May-September

Distribution: Fairly common in Semi-evergreen forests of Paripode.

GLOCHIDION J.R.Forst. & G.Forst., Charact. Gen. 113, t. 57. 1776, *nom. cons.*

- 1a. Style 5-toothed at apex; capsule with a stiff elongated style *G. candolleanum*
- 1b. Style 4 toothed at apex; capsule with a stiff elongated style 2
- 2a. Capsule tomentose, pinkish *G. hohanackeri* var. *johnstonei*
- 2b. Capsule smooth, greenish-yellow *G. ellipticum*

Glochidion candolleanum (Wight & Arn.) Chakrab. & Gangop., Journ. Econ. Tax. Bot. 19: 191. 1995; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 347. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 740. 2009. *Lobocarpus candolleanus* Wight & Arn., Prodr. 1: 7. 1834. *Glochidion neilgherrense* Wight, Ic. 5: 229. 1852; Hook. f., Fl. Brit. India 5: 316. 1887; Gamble, Fl. Pres. Madras 1307(914). 1925. *Glochidion arboreum* Wight, Ic. t. 1907. f.1. 1852; Hook. f., Fl. Brit. India 5: 316. 1887; Gamble, Fl. Pres. Madras 1307(914). 1925. *Glochidion sisparensense* Gamble, Fl. Pres. Madras 1307(914). 1926.

Small trees, branchlets tomentose. Leaves simple, alternate, to 9 x 3.5 cm, oblong or ovate-oblong, acute, base obtuse, tomentose along veins below. Flowering branches slender, zig-zag. Flowers greenish-yellow. Style elongated. Capsule 0.8 cm across, 6-lobed.

Ambalappara, KVB 31792, 31704

Fl. & Fr.: December-March

Distribution: Common in Evergreen forests of Ambalappara.

Glochidion ellipticum Wight, Ic. t. 1906. 1852; Hook. f., Fl. Brit. India 5: 321. 1887; Gamble, Fl. Pres. Madras 1308(915). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 418. 1988; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 19: 199. 1995; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 348. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 740. 2009. *Phyllanthus malabaricus* Muell.-Arg., Linnaea 34: 69. 1865 & in Flora 48: 386. 1865 & in DC., Prodr. 15: 305. 1866. *Glochidion malabaricum* (Muell.-Arg.) Bedd., Fl. Sylv. 193. 1872; Hook. f., Fl. Brit. India 5: 319. 1887; Gamble, Fl. Pres. Madras 1308(915). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 419. 1988.

Trees, to 15 m high, bark blackish-grey or dark brown, with shallow vertical striations; branchlets sometimes sparsely puberulous when young, become glabrous. Leaves simple, alternate, distichous, 4-17 x 1.5-9 cm, elliptic, oblong, elliptic-oblong, elliptic-lanceolate, oblong-lanceolate, subfalcate or obovate, apex apiculate to acuminate or obovate, base acute, attenuate, round or oblique, margin entire, coriaceous, glabrous, glossy; lateral nerves 5-12 pairs, pinnate, prominent, intercostae scalariform, faint; stipule lateral; petiole 2-9 mm long, stout, glabrous. Flowers unisexual, yellow, in dense clusters from leaf scars. Male flowers: pedicels 5-17 mm long, filiform; tepals 3+3, 1.5-5 x 0.3-2 mm, ovate, elliptic, triangular, oblong, linear or spatulate; stamens 3-4, 1-1.5 mm long, connate by their connectives in a column; connectives produced. Female flowers: sessile or pedicels 1-5 mm long; tepals 3+3, 1-3 x 0.5-1 mm, linear, oblong, elliptic or triangular, occasionally sparsely puberulous; ovary superior, 0.5-1 mm across, subglobose, densely hispid, usually 4 locular, ovules 2 in each cell; style 2-3 mm, columnar to conical, sometimes obconic; lobes corresponds to locules, suborbicular, oblong or linear, occasionally bilobulate, erect or spreading. Fruit a capsule 3-10 x 6-15 mm, depressed, unlobed or shallowly to deeply lobed with the lobes rounded or bilobular, crustaceous, hirsute, pedicels 2-8 mm; seeds brown, glabrous.

Kariyenkappu, KJD 26051

Fl. & Fr.: January-July

Distribution: Fairly common in Plantations of Kariyenkappu; Evergreen forests of Chavachi and Moonamthode. Endemic to Western Ghats.

Glochidion hohenackeri (Muell.-Arg.) Bedd. **var. johnstonei** (Hook. f.) Chakrab. & Gangop., Journ. Econ. Tax. Bot. 19: 210. 1995; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 349. 2007. *Glochidion johnstonei* Hook. f., Fl. Brit. India 5: 314. 1887; Gamble, Fl. Pres. Madras 1307(914). 1925.

Trees, to 10 m high; branchlets tawny or grey-tomentellous to sparsely puberulous. Leaves simple, alternate, distichous, 7-13 x 1.5-6.5 cm, oblong, elliptic, elliptic-oblong, oblong-lanceolate, oblong-ovate or subfalcate, apex acuminate, base oblique, glabrous above, sparsely pilose on major nerves beneath, margin entire, coriaceous; lateral nerves 4-8 pairs, pinnate,

prominent, intercostae reticulate, prominent stipules lateral; petiole 2-5 mm, slender, puberulous. Flowers unisexual, yellow. Male flowers: in many flowered axillary clusters; pedicels 3-8 mm long, densely tomentose; tepals 3+3, 3-4 x 0.8-1.5 mm, lanceolate or oblanceolate, puberulous; stamens 3-4, connate by their connectives in a column; connectives produced. Female flowers: in few flowered axillary clusters; sessile; perianth 1.2-3 x 1.5-3.5 mm, tomentellous to glabrescent, irregularly 4-6 toothed; ovary superior, subglobose, 1 mm across, 4-6 locular, ovules 2 in each cell, tomentellous to glabrous; styles 4-6, usually connate into subglobose or discoid mass, often with minute projection at the corners, sometimes free or connate only at base. Fruit a capsule 2-5 x 6-12 mm, 4-6 locular, depressed, deeply lobed with the lobes bilobulate, puberulous to glabrous, pedicels absent, to 4 mm long.

Moonamthode, *KJD 26374*

Fl. & Fr.: November-April

Distribution: Rare in Evergreen forests of Moonamthode.

Endemic to Peninsular India; Conservation status: Vulnerable.

HOMONOIA Lour., Fl. Cochinch. 637. 1790.

1a. Leaf margin serrate; inflorescence less than 5 cm long *H. retusa*

1b. Leaf margin entire; inflorescence over 6 cm long..... *H. riparia*

Homonoia retusa (Graham ex Wight) Muell.-Arg., Linnaea 34: 200. 1865; Hook. f., Fl. Brit. India 5: 456. 1887; Gamble, Fl. Pres. Madras 1333(933). 1925; Ramach., Journ. Econ. Tax. Bot. 3: 660. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 419. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 137. 2007. *Adelia retusa* Graham ex Wight, Ic. t.1869. 1852.

Shrubs. Leaves simple, alternate, 2-4 x 1-2 cm, oblong to spatulate, apex obtuse to retuse, margin serrate to dentate; lateral nerves ca. 4 pairs; petiole to 3 mm. Spikes to 1 cm long. Male 4 mm across: tepals 3, glabrescent, 2.5 mm; anthers 0.2 mm. Female flowers 3 mm across: tepals 6-8, linear, 2 mm, acute; ovary 3-lobed; styles 3 mm, recurved, Capsule ca. 3.5 mm across.

Valayamchal, *KJD 31477*

Fl. & Fr.: January-August

Distribution: Rare in Semi-evergreen forests of Valayamchal. Endemic to Peninsular India.

Homonoia riparia Lour., Fl. Cochinch. 637. 1790; Hook. f., Fl. Brit. India 5: 455. 1887; Gamble, Fl. Pres. Madras 1333(933). 1925; Ansari, Fl. Kasaragod Div. 340. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 420. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 137. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 741. 2009. *Adelia neriiifolia* Heyne ex Roth, Nov. Pl. Sp. 375. 1821.

Large shrubs; branchlets pubescent, reddish. Leaves simple, spiral, closely packed, to 18 x 2 cm, linear-oblong, acute at either ends, penni-nerved, covered with yellow scales below and pubescent along nerves; petiole 1 cm long, tomentose; stipule filiform. Flowers dioecious in axillary 10-15 cm long racemes. Male flowers 3 mm across, sepals 2-5, glabrous, ciliate along the margins, yellowish red; stamens many, free. Female flowers sessile, densely packed; bracts ovate; sepals 2 mm long, lanceolate, ciliate; ovary densely hairy; styles 3, spreading, linear. Capsule 5 mm across, globose, hairy.

Chavachi, *KVB 31608*

Fl. & Fr.: December-May

Distribution: Along the banks of streams and Rivers.

MACARANGA Du Petit-Thouars, Gen. Nova Madag. 26. 1806.

Macaranga peltata (Roxb.) Muell.-Arg. in DC., Prodr. 15: 1010. 1866; Gamble, Fl. Pres. Madras 1326(928). 1925; Manilal & Sivar., Fl. Calicut 259. 1982; Ansari, Fl. Kasaragod Div. 341. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 421. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 142. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 742. 2009. *Osyris peltata* Roxb., Fl. Ind. 3: 755. 1832. *Mappa peltata* (Roxb.) Wight, Ic. t. 817. 1844-45. *Macaranga roxburghii* Wight, Ic. t. 1949, f.4. 1853; Hook. f., Fl. Brit. India 5: 448. 1887. *Macaranga tomentosa* Wight, Ic. t. 1949, f.1. 1853.

Diocious trees, to 18 m high; bark surface pale, greyish-brown mottled with white, smooth, lenticellate; brittle; exudation red, gummy; branchlets thick, terete, glaucous. Leaves simple, alternate, 11-25 x 9-20 cm, ovate-orbicular, deltoid-ovate, ovate or orbicular, apex acute or acuminate, base peltate, margin entire, glabrous or glabrescent, pubescent with reddish glands beneath, coriaceous; stipules large, lateral, ovate-acuminate, reflexed, cauducous; petiole 12-35 mm long, stout, glabrous; lamina 8-10 ribs from base, palmate, prominent beneath; lateral nerves 7-8 pairs, parallel, regular, prominent, intercostae scalariform, much prominent; margin glandular. Flowers unisexual, greenish-yellow. Male flowers: in axillary, much branched, dense, tomentose, panicles, concealed in large bracts; bracteoles concave; tepals 3, minute, obovate, cuneate; stamens 2-8, free, shortly connate below, exerted. Female flowers: in panicles simpler than in males, branches racemes with larger bracts; tepals 4, basally connate at base; ovary superior, 2-6-celled, densely glandular, ovule one in each cell; style lateral; stigma sessile, often embracing one side of the ovary, thickly papillose. Fruit a capsule, 5-6 mm across, globose, hairy, glandular, black; seed one, black.

Kariyenkappu, *KJD 25591*

Fl. & Fr.: January-February

Distribution: Common in degraded forest areas and plantations.

MALLOTUS Lour., Fl. Cochinch. 601. 1790.

- 1a. Capsule smooth with red gland *M. philippensis*
- 1b. Capsule echinate or muricate without red glands 2
- 2a. Leaves alternate, peltate..... *M. tetracoccus*
- 2b. Leaves opposite, not peltate..... 3
- 3a. Young capsule with dense long soft pubescent spines *M. resiosus var. muricatus*
- 3b. Young capsule with short stiff spines *M. beddomei*

Mallotus beddomei Hook. f., Fl. Brit. India 5: 438. 1887; Gamble, Fl. Pres. Madras 1323(925). 1925; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 146. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 744. 2009.

Large shrubs. Leaves simple, alternate, to 25 x 9 cm, elliptic to oblanceolate, long-acuminate at apex, base acute, dentate along the margins, glabrous; nerves 5 or 6 pairs, nervules parallel, prominent; petioles unequal, 0.5-3 cm long. Male racemes 5-10 cm long, shortly tomentose. Flowers many, clustered; sepals 3 x 2 mm, ovate, glabrous; stamens many. Capsule 1.2 cm across, with soft echinate process.

Chavachi, *KJD 31805*

Fl. & Fr.: October-April

Distribution: Fairly common in Evergreen forests of Chelachode, Chavachi, Kattikkari and Monnamthode; Semi-evergreen forests of Paripode. Endemic to southern Western Ghats.

Mallotus philippensis (Lam.) Muell.-Arg., *Linnaea* 34: 196. 1865; Hook. f., *Fl. Brit. India* 5: 442. 1887, "philippinensis"; Gamble, *Fl. Pres. Madras* 1322(924). 1925; Manilal & Sivar., *Fl. Calicut* 260. 1982; Ansari, *Fl. Kasaragod Div.* 342. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 422. 1988; N.P. Balakr. & Chakrab., *Fam. Euphorbiaceae India* 150. 2007; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 744. 2009. *Croton philippensis* Lam., *Encycl.* 2: 206. 1786. *Mallotus philippensis* (Lam.) Muell.-Arg. *var. tomentosus* Gamble, *Fl. Pres. Madras* 1322(924). 1925.

Dioecious trees, to 12 m high, bark 4-5 mm thick, pale brown; branchlets, young leaves and inflorescence tawny or rusty pubescent. Leaves simple, alternate, 5-20 x 2-8 cm, ovate or ovate-lanceolate, apex acuminate or acute, base acute or round, margin entire or sparsely serrate, glabrous above, greyish pubescent to fulvous tomentose with minute red glands beneath; coriaceous; 3-ribbed from base, lateral nerves upto 6 pairs, pinnate, ascending, prominent, intercostae scalariform, prominent; stipules lateral, cauducous; petiole 7-60 mm long, stout, swollen at base, fulvous-pubescent with 2 small sessile glands on each side of the submit. Flowers unisexual, brick red, in rusty puberulous, terminal spicate panicles. Male flowers: 4.5 mm across; tepals 4, lanceolate, stamens many. Female flowers: 4 mm across, tepals 3 or 4, thicker than in males, ovate-lanceolate; ovary with red glands, superior, 3-celled, ovules one in each cell; styles 3, to 3.5 mm long, papillose. Fruit a capsule, 7-8 mm across, globose, 3-lobed, loculicidally 3 valved, densely red-glandular, pubescent; seeds 1-4, globose, glabrous, black.

Pookundu, *KJD* 25468

Fl. & Fr.: October-March

Distribution: Common in Semi-evergreen forests of Pookundu to Pothanplavu and Paripode; Evergreen forests of Meenmutty.

Mallotus resinus (Blanco) Merr. **var. muricatus** (Wight) Balakr. & Chakrab., *Rheedea* 1: 39. 1991; N.P. Balakr. & Chakrab., *Fam. Euphorbiaceae India* 151. 2007. *Claoxylon muricatus* Wight, *Ic. t.* 1886. 1852. *Mallotus subramanyamii* J.L.Ellis, *Bull. Bot. Surv. India* 25: 199. 1985. *Mallotus resinus* (Blanco) Merr. *var. subramanyamii* (J.L.Ellis) Chakrab., *J. Econ. Tax. Bot.* 6: 704. 1985.

Shrubs or trees, up to 8 m tall; branchlets flattened. Leaves simple, opposite, unequal, short-petioled, penninerved, glabrous, mostly cuneate-obovate to elliptic and distally repand-dentate with a few conspicuous macular glands near the base. Staminate inflorescences not branched; flowers clustered per bracteole; bracteoles with entire margin. Pistillate inflorescences not branched. Capsules with long, slender spines, glabrous.

Chelachode, *KVB* 31231

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Chavachi, Chelachode and Kannadivechakunnu.

Mallotus tetracoccus (Roxb.) Kurz, *J. Asiat. Soc. Bengal Pt. 2, Nat. Hist.* 41: 245. 1873; Ansari, *Fl. Kasaragod Div.* 342. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 423. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 745. 2009. *Rottlera ferruginea* Roxb., *Fl. Ind.* 3: 828. 1832. *Mallotus ferrugineus* (Roxb.) Müll.Arg. in *DC., Prodr.* 15: 982. 1866; N.P. Balakr. &

Chakrab., Fam. Euphorbiaceae India 146. 2007. *Rottlera albus* var. *occidentalis* Hook. f., Fl. Brit. India 5: 429. 1887; Gamble, Fl. Pres. Madras 1321(924). 1925.

Dioecious trees, to 20 m high, bark 5-8 mm thick, surface grey, smooth, fibrous; branchlets grey tawny tomentose; young parts covered with rusty lepidote scales. Leaves simple, alternate, 9-21 x 7.5-20 cm, orbicular or deltoid-ovate, apex acuminate, base truncate, peltate, subcordate or round, margin entire or glandular dentate, glabrous above and tomentose below when matured, coriaceous; usually 5-ribbed from base, lateral nerves 6-8 pairs, pinnate, prominent, intercostae scalariform, prominent; stipules lateral, deciduous; petiole 4.5-10 cm long, stout, swollen at base, with 2 large glands at the top, stellate tomentose. Flowers unisexual, yellow, in terminal branching tomentose spicate panicles. Male flowers: 7 mm across, tepals 4, 2 mm, ovate; stamens many, crowded on a fleshy receptacle; filaments to 3 mm; anther cells unequal. Female flowers: 5 mm across, tepals 4, 2 mm, connate at base; ovary superior, 0.8 x 0.7 cm, 3-4 locular, densely stellate hairy, ovule one in each cell; style 3 mm, 3, plumose; stigma acute. Fruit a capsule 7-8 mm across, globose, loculicidal 3-4 valved, echinate with soft, woolly spines, white-tomentose; seeds angular, black.

Meenmutty, KVB 31289

Fl. & Fr.: July-April

Distribution: Fairly common in Evergreen forests of Meenmutty and Chavachi.

MICROCocca Bentham, in Hook. Niger Fl. 503. 1849.

1a. Perennial shrubs; leaves to 15 cm long; racemes to 12 cm long..... *M. beddomei*

1b. Annual herbs; leaves under 4 cm long; racemes to 7 cm long..... *M. mercurialis*

Micrococca beddomei (Hook.f.) Prain, Ann. Bot. (London) 25: 630. 1911; Gamble, Fl. Pres. Madras 1328(929). 1925; Mohanan & Sivad., Fl. Agasthyamala 614. 2002. *Claoxylon beddomei* Hook.f., Fl. Brit. India 5: 413. 1887; Susila Rani & Balakr., Rheedea 5: 128. 1995; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 130. 2007.

Herbs. Leaves simple, alternate, 3-4 x 2.5 cm, ovate or ovate-lanceolate, apex acuminate, base acute, serrate, puberulous, lateral nerves ca. 4 pairs; petiole to 2 cm. Spikes lax, slender, to 5 cm long; bracts minute. Perianth lobes of male ovate; of female 3, lanceolate. Capsule 3-lobed, 5 mm across, glabrescent; seeds 1.2 mm across.

Kattikkari, KVB 31556

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests of Kattikkari and Kannadivechakunnu. Endemic to southern Western Ghats.

Micrococca mercurialis (L.) Benth. in Hook., Niger. Fl. 503. 1849; Gamble, Fl. Pres. Madras 1328(929). 1925; Manilal & Sivar., Fl. Calicut 268. 1982; Ansari, Fl. Kasaragod Div. 344. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 746. 2009. *Tragia mercurialis* L., Sp. Pl. 980. 1753. *Claoxylon mercurialis* Thw., Enum. Pl. Zeyl. 271. 1861; Hook. f., Fl. Brit. India 5: 412. 1887; Susila et al., Rheedea 5(2):131.1995; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 131. 2007.

Annual herbs. Leaves simple, alternate, 2-4x 1-2.5 cm, ovate or ovate-lanceolate, apex acute or shortly acuminate, base rounded, serrate on margins, puberulous, membranous; petiole to 2.5 cm long. Flowers in interrupted clusters, on axillary racemes, often drooping; bracts minute. Male flowers minute, c. 1.5 mm across; perianth 1-seriate, 3-lobed, lobes ovate; stamens 3-5, free, with 6-8-

ciliate glandular scales between filaments. Female flowers ca 2 mm across; tepals 3, lanceolate, shortly connate; ovary 3-lobed, sparsely pubescent, 3-locular; ovules 3; styles 3; stigma linear, plumose. Capsule 4-5 mm across, 3-lobed, glabrescent; seeds c. 1mm across, globose, minutely arillate.

Paripode, *KJD 25599*

Fl. & Fr.: June-December

Distribution: Along the boundaries near Farm.

MICROSTACHYS A.Juss., Euphorb. Gen.: 48. 1824.

Microstachys chamaelea (L.) Muell.-Arg., Linnaea 32: 95. 1863; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 293. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 747. 2009. *Tragia chamaelea* L., Sp. Pl. 981. 1753. *Sebastiania chamaelea* (L.) Muell.-Arg. in DC., Prodr. 15: 1175. 1866; Hook. f., Fl. Brit. India 5: 475. 1888; Gamble, Fl. Pres. Madras 1344(940). 1925; Ansari, Fl. Kasaragod Div. 347. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 426. 1988; Sunil & Sivadasan, Fl. Alappuzha Dist. 651. 2009.

Erect or diffuse herbs. Leaves simple, alternate, 2-4.5 x 0.7-1 cm, oblong-lanceolate, apex obtuse or acute, base obtuse, margin minutely dentate; petiole to 3 mm long. Flowers in monoecious slender axillary spikes, 1.5-2.5 cm long. Male flowers minute, c. 1.5 mm across in clusters of 3; tepals 5, connate; stamens 2-4, anthers globose. Female flowers solitary at base of spike, c. 1 mm across; tepals 3, ovate; ovary 3-lobed, echinate without; ovule 1 in each cell; style 3, connate at base. Capsule 3-lobed each with two rows of soft prickles on the back, 4-6 mm across; seeds 1-1.5 mm long, oblong, carunculate.

Chavachi, *KJD 25600*

Fl. & Fr.: July-December

Distribution: Rare along the boundaries of forests at Chavachi.

PARACROTON Miquel, Fl. Ind. Bat. 1(2): 382. 1859.

Paracroton integrifolius (Airy Shaw.) Balakr. & Chakrab., Kew Bull. 48: 718. 1993; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 218. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 747. 2009. *Ostodes integrifolius* Airy Shaw, Kew Bull. 16: 362. 1963. *Ostodes zeylanicum* var. *minor* sensu Gamble, Fl. Pres. Madras 1336(935). 1925, non (Thw.) Hook.f. 1887. *Fahrenheitia integrifolia* (Airy Shaw) Airy Shaw, Kew Bull. 20: 410. 1966; Ramach. & V.J. Nair, Fl. Cannanore Dist. 417. 1988.

Trees, to 18 m high, bark 3-4 mm thick, surface brown, smooth, exfoliations small; brittle or semifibrous; branches lepidote-pubescent. Leaves simple, alternate, 10-16 x 4-7 cm, elliptic or elliptic-obovate, apex shortly acuminate, base cuneate, margin entire or distantly indistinctly serrate, glabrous, coriaceous; lateral nerves 10-13 pairs, pinnate, prominent, intercostae scalariform, prominent; stipules lateral, caducous; petiole 10-25 mm long, stout, 4 glands seen at the apex of the petiole 2 on either sides, lepidote scales present. Flowers unisexual, white, in terminal and axillary racemes; tepals 10 in 2 series; outer 5 lobed, unequal; inner 5 petaloid, free; stamens 10-20, free; connective broad; ovary superior, glabrous, 3-celled, 4 mm across, strigose, ovules 1 in each cell; styles 3, short, bifid, disc of 5-10 glands. Fruit a capsule, 2 cm across, 6-ribbed, subglobose, tomentose, breaking into 3, 2-valved cocci; seeds mottled.

Pothurumi, *KVB 31615*; Kattikkari State Boundary, *KJD 26063*

Fl. & Fr.: November-December

Distribution: Fairly common in Evergreen forests of Pothurumi, Kattikkari and Mullenpara.

PHYLLANTHUS L., Sp. Pl. 981. 1753.

- 1a. Trees; stamens 3; fruits 1.8-2.5 cm across..... *P. emblica*
- 1b. Erect or scandent herbs or shrubs; stamens 5..... 2
- 2a. Fruits baccate; scandent shrubs..... *P. reticulatus*
- 2b. Fruits capsular 3
- 3a. Leaves reddish; capsules densely muricate *P. urinaria*
- 3b. Leaves green; capsules smooth 4
- 4a. Fruting perianth smaller than capsule..... *P. amarus*
- 4b. Fruting perianth as long as capsule..... *P. rheedei*

Phyllanthus amarus Schum. & Thonn. in C.F. Schumacher, Besk. Guin. Pl. 421. 1827; Manilal & Sivar., Fl. Calicut 264. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 424. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 386. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 749. 2009. *Phyllanthus fraternus* auct. non Webster 1955; Ansari, Fl. Kasaragod Div. 345. 1985. *Phyllanthus niruri* sensu Hook. f., Fl. Brit. India 5: 298. 1887, non L. 1753; Gamble, Fl. Pres. Madras 1290(903). 1925.

Erect herbs to 30 cm tall. Leaves simple, 6-8 x 3-4 mm, oblong, apex obtuse to acute, base unequal sided, lower surface glaucous; stipules lanceolate, scarious. Male flowers towards tip of branchlets, solitary, axillary; tepals 5, ovate; stamens 3, exserted; filaments connate; disc of 5 glands. Female flowers c. 1.5 mm across; tepals 5, oblong; ovary globose; style erect, recurved; pedicel to 2 mm long. Capsule c. 2 mm across, globose; seeds 6, trigonous, vertically muriculate.

Kariyenkappu, *KJD 26278*

Fl. & Fr.: July-October

Distribution: Along the boundaries and open areas in the forests.

Phyllanthus emblica L., Sp. Pl. 982. 1753; Hook. f., Fl. Brit. India 5: 289. 1887; Manilal & Sivar., Fl. Calicut 262. 1982; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 369. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 749. 2009. *Emblica officinalis* Gaertn., Fruct. 2: 122. 1791; Gamble, Fl. Pres. Madras 1295(906). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 414. 1988.

Deciduous trees, to 15 m high, bark grey-brown, rough, irregularly flaking. Leaves simple, alternate, bifarious on short deciduous branchlets, closely overlapping, subsessile, 0.4-1.5 x 2-4 mm, oblong or linear-oblong, apex obtuse and shortly apiculate, base round, glabrous, membranous, nerves obscure; stipules minute, lateral, linear. Flowers unisexual, 2-3 mm across, greenish-yellow, densely clustered in leaf axils. Male flowers: tepals 6, oblanceolate, 1.5 mm, obtuse, stamens 3, anthers oblong, connate by their connectives; apiculate; disc glands 6. Female flowers: tepals 6, oblanceolate, obtuse; ovary superior, 1.5 mm, 3-celled; ovules 2 in each cell; styles 3, broadly fimbriate, recurved, stigmatiferous. Fruit a capsule 1.5-2.5 cm across, subglobose, dehiscent into 6 cocci, disc enlarged to give an appearance of fleshy yellowish-green, indehiscent berry.

Ambalappara, *KJD 26331*

Fl. & Fr.: July-February

Distribution: Occasional in Grasslands.

Phyllanthus reticulatus Poir. in Lam., Encycl. 5: 298. 1804; Hook. f., Fl. Brit. India 5: 288. 1887; Manilal & Sivar., Fl. Calicut 262. 1982; Ansari, Fl. Kasaragod Div. 345. 1985; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 382. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 751. 2009. *Kirganelia reticulata* (Poir.) Baill., Etud. Gen. Euphorb. 613. 1858; Gamble, Fl. Pres. Madras 1294(905). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 421. 1988; Vajr., Fl. Palghat Dist. 432. 1990. *Anisonema multiflora* Wight, Ic. t. 1899. 1852.

Scandent shrubs; branches pubescent. Leaves simple, alternate, 1.5-2 x 1-1.5 cm, elliptic, apex acute or obtuse, base acute, glabrous; stipules lanceolate, often spinescent; petiole to 2 mm long. Male flowers in axillary fascicles; tepals 5, unequal, obovate, imbricate; stamens 5, outer 2-3 free, inner connate. Female flowers solitary; tepals 5, shortly connate, obovate, valvate, margin scarious; ovary globose, 5-12-locular; styles 3, bifid. Fruits 5-7 mm across, globose, black; seeds 8-10 trigonous.

Kariyenkappu, *KJD 26279*

Fl. & Fr.: August-December

Distribution: Rare in Plantations of Kariyenkappu.

Phyllanthus rheedei Wight, Ic. t. 1895. f. 1. 1852, 'rheedii'; Hook. f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Pres. Madras 1289(902). 1925; Ramach. & V.J. Nair, Fl. Cannanore Dist. 425. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 379. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 751. 2009. *Phyllanthus kozhikodianus* Sivar. & Manilal, J. Indian Bot. Soc. 56. 165. 1977; Manilal & Sivar., Fl. Calicut 264. 1982; Sasidh., Fl. Periyar Tiger Reserve 378. 1998.

Woody herbs, to 80 cm high; stems glabrous. Leaves simple, alternate, 2.5 x 1.5 cm, obovate, obtusely acute, distant on lateral branchlets, glaucous beneath; nerves 7-9 pairs, stipules lanceolate, acuminate; petiole 2mm long. Flowers solitary or fascicled; sepals 6, 4.5 x 2mm, obovate, obtuse, green with narrow white margins, glabrous; ovary globose, styles 3, bifid, radiating. Capsule 5 mm across, glabrous, smooth; seeds 2 x 1.5 mm, trigonous, longitudinally striate with minute cross bars.

Ambalappara, *KJD 26142; KVB 31700*

Fl. & Fr.: November-January

Distribution: Common in Evergreen forests of Ambalappara, Asthipara and Mullenpara.

Phyllanthus urinaria L., Sp. Pl. 982. 1753; Hook. f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Pres. Madras 1289(902). 1925; Manilal & Sivar., Fl. Calicut 266. 1982; Ansari, Fl. Kasaragod Div. 345. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 425. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 389. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 752. 2009. *Phyllanthus leprocarpus* Wight, Ic. t. 1895. f. 4. 1852.

Erect herbs to 40 cm tall; young stem and leaves reddish. Leaves simple, alternate, 0.6-1.2 x 0.4-0.6 cm, oblong, apex acute to apiculate, base oblique, margin ciliate, glabrous; stipules c. 1mm long, linear to subulate. Male flowers in axillary clusters; tepals 6, 1-seriate, orbicular; stamens 5, filaments united; disc 6-lobed. Female flowers in lower axils, solitary; tepals 6, obovate-oblong; ovary warted without; stigma 3, each 2-fid; disc annular. Capsule 2-3 mm

across, globose, 3-lobed, sessile, verrucose; seeds 6, trigonous, transversely ridged.

Kariyenkappu, *KJD 25402, 31872*

Fl. & Fr.: July-October

Distribution: Fairly common in Plantations of Kariyenkappu near boundaries.

SAUROPUS Blume, *Bijdr.* 595. 1825-1826.

- 1a. Leaves to 2.5 cm long, obtuse at apex; fruiting perianth enlarged *S. quadrangularis*
- 1b. Leaves more than 5 cm long, acuminate at apex; fruiting perianth hardly enlarged 2
- 2a. Fruits 1.5-2 cm across; white *S. gour-maitii*
- 2b. Fruits 1 cm across; pink *S. androgynus*

Sauropus androgynus (L.) Merr., *Bull. Bur. Forest. Philipp. Islands* 1: 30. 1903; Gamble, *Fl. Pres. Madras* 1303(911). 1925; Manilal & Sivar., *Fl. Calicut* 261. 1982; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 426. 1988; Chakrab. & Gangop., *Journ. Econ. Tax. Bot.* 20: 519. 1996; N.P. Balakr. & Chakrab., *Fam. Euphorbiaceae India* 393. 2007; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 753. 2009. *Clusia androgyna* L., *Mant. Pl.* 1: 128. 1767. *Sauropus albicans* Blume, *Bijdr.* 596. 1826; Hook. f., *Fl. Brit. India* 5: 332. 1887. *Sauropus indicus* Wight, *Ic. t.* 1952. f.2. 1853.

Erect monoecious shrubs, 1-1.5 m high; leafy branches seemingly clustered towards tip of branches. Leaves simple, alternate, 2.5-10 x 1.5-13.5 cm, triangular-lanceolate, acuminate at apex, broad and truncate at base, glaucous beneath. Flowers axillary, solitary to clustered. Perianth 1-seriate, 6-lobed. Stamens 3, filaments connate to a column. Ovary globose, 0.15-0.2 cm diam., 3-celled; ovules 2 in each cell; style 3; stigma curved. Capsules globose, 1-1.5 cm diam. with persistent styler portion at tip.

Kariyenkappu, *KJD 22504*

Fl. & Fr.: August-December

Distribution: At earlier settlements.

Sauropus gour-maitii Chakrab. & M.Gangop., *J. Econ. Taxon. Bot.* 20: 529. 1996.

Shrubs, 2-4 m high, almost glabrous; leaf-bearing branchlets 15-30 cm long, pale greenish-brown to dark brown, terete, 1-3 mm thick, initially sparsely papillose-puberulous, soon glabrous. Leaves simple, alternate, 6-13 x 1.5-5 cm, ovate-lanceolate, triangular-lanceolate, acute to acuminate at apex, obtuse, subtruncate or acute at base, membranous, green to brown above when dry, paler beneath; lateral nerves 7-8 pairs; petioles 1.5-2 x ca 1 mm; stipules linear-lanceolate, up to 5 mm long. Male flowers : pedicels 1.5-4 mm long; calyx concave-cupular, ca 1 x 1.5 mm, deeply 6-lobed; segments oblong-oblancheolate, ca 1.2 x 0.5 mm, incurved and shortly bifid at apex; staminal column ca 0.5 mm long; anthers narrowly ovoid, ca 0.8 mm long, erect when young, finally horizontal. Female flowers: pedicels 4-5 x ca 0.5 mm; calyx cupular, ca 3 x 3.5 mm; segments ovate, 2-2.5 x 1-1.5 mm, acute to subacute; ovary trigonous, ca 1 x 0.8 mm; styles ca 0.5 mm long, erect, shortly bifid at apex. Capsules somewhat depressed, 8-10 x 13-15 mm, unlobed, thin-walled, brown when dry; pedicel 10-12 mm long, slender.

Pothurumi, *NS & KJD 25551*

Fl. & Fr.: December-July

Distribution: Rare in Evergreen forests of Pothurumi. Endemic to Western Ghats.

Sauropus quadrangularis (Willd.) Muell.-Arg., Linnaea 32: 73. 1863; Hook. f., Fl. Brit. India 5: 335. 1887; Gamble, Fl. Pres. Madras 1303(911). 1925; Manilal & Sivar., Fl. Calicut 261. 1982; Ansari, Fl. Kasaragod Div. 347. 1985; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 534. 1996; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 395. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 754. 2009. *Phyllanthus quadrangularis* Willd., Sp. Pl. 4: 585. 1805. *Sauropus compressus* Muell.-Arg in DC., Prodr. 15: 243. 1866; Hook. f., Fl. Brit. India 5: 336. 1887; Chakrab. & Gangop., Journ. Econ. Tax. Bot. 20: 526. 1996.

Glabrous shrubs. Leaves simple, alternate, ovate-obtuse, emarginate at apex, glaucous below, black when dried; nerves 5 pairs, prominent; petiole 2 mm long; stipules cordate at base. Flowers solitary, axillary, pedicelled. Male flowers 3 mm across; sepals ovate, acute; stamens 3, anthers sessile on erect staminal column. Sepals of female flowers broadly ovate, obtuse, emarginate, united by the disk; styles 3, 2-fid at apex. Capsule 1.2 cm across, smooth, glabrous.

Paripode, *KJD 22505*

Fl. & Fr.: Throughout the Year

Distribution: Along Forest boundaries and plantations.

TRAGIA L., Sp. Pl. 980. 1753.

- 1a. Leaves cordate at base; fruiting perianth lobes deeply lobed,
Sparsely hispid *T. montana*
1b. Leaves acute or rounded at base; fruiting perianth lobes
densely hispid..... *T. involucrata*

Tragia involucrata L., Sp. Pl. 980. 1753; Hook. f., Fl. Brit. India 5: 465. 1888,p.p.; Gamble, Fl. Pres. Madras 1332(931). 1925; Manilal & Sivar., Fl. Calicut 267. 1982; Ansari, Fl. Kasaragod Div. 348. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 427. 1988; N.P. Balakr. & Chakrab., Rheedia 16: 19. 2006 & Fam. Euphorbiaceae India 181. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 755. 2009.

Slender, twining herbs with stinging hairs. Leaves simple, alternate, 6-10 x 3-5.5 cm, ovate or elliptic, base acute or rounded, margin serrate, apex acuminate, hispidulous on both sides; petiole to 2.5 cm long. Spikes axillary, monoecious, to 2 cm long; male flowers above, female flowers 1-2, at the base. Male flowers c. 1.5 mm across; bracts spatulate; tepals 3, spreading; stamens 3, anthers subsessile. Female flowers c. 3 mm across, ebracteate; tepals 6, c. 1 mm long, ovate-lanceolate, enlarged and spreading in fruits; style 3, spreading. Capsule c. 0.6 x 1 cm, 3-lobed, hispid; seeds globose.

Chavachi, *KJD 22538*

Fl. & Fr.: July-December

Distribution: Rare in forest plantations and road side.

Tagia montana (Thw.) Muell.-Arg., Linnaea 34: 183. 1856 & in DC., Prodr. 15: 944. 1866; N.P. Balakr. & Chakrab., Rheedia 16: 20. 2006 & Fam. Euphorbiaceae India 182. 2007. *Tragia involucrata* L. var. *montana* Thw., Enum. Pl. Zeyl. 270. 1861. *Tragia involucrata* L. var. *cordata* Muell.-Arg. in DC., Prodr. 15: 943. 1866; Hook. f., Fl. Brit. India 5: 465. 1888. *Tragia muelleriana* Pax & Hoffm. in Engl., Pflanzenr. Euphorb.-Plukenetiiin.-Eiprinin.-Ricinin. 80. 1919; Gamble, Fl. Pres. Madras 1332(932). 1925.

Slender twiners; young shoots densely hirsute. Leaves alternate, 4-12 x 2-6, ovate-cordate to suborbicular, to ovate-elliptic, cordate to subcordate at base at base, acuminate at apex, dentate-serrate along the margins, hispid; 3-nerved at base; petiole 0.5-3 cm long; stipules lanceolate, 3-4 mm long. Racemes terminal and leaf opposed, 3-6 cm long with 1 or 2 female flowers at the base and several male towards the distal portion. Male flowers 2 mm across, tepals 3, ovate to suborbicular 1 mm long; stamens 3. Female flowers 5 mm, tepals 6, ovate, fimbriate; ovary subglobose, 3-lobed, densely hispid. Capsule depressed globose, 5 x 10 mm, deeply 3-lobed, enclosed by the fruiting tepals; seeds 3, globose.

Ambalappara, NS & KJD 31959

Fl. & Fr.: August-January

Distribution: Fairly common in Evergreen forests of Ambalappara and Mullenpara. Endemic to Western Ghats.

TREWIA L., Sp. Pl. 1193. 1753.

Trewia nudiflora L., Sp. Pl. 1193.1753; Hook. f., Fl. Brit. India 5: 423. 1887; Gamble, Fl. Pres. Madras 1319(922). 1925; Manilal & Sivar., Fl. Calicut 271. 1982; Ansari, Fl. Kasaragod Div. 348. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 428. 1988; N.P. Balakr. & Chakrab., Fam. Euphorbiaceae India 155. 2007; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 755. 2009. *Trewia polycarpa* Benth. in Benth. & Hook.f., Gen. Pl. 3:318.1880; Hook. f., Fl. Brit. India 5:424.1887; Gamble, Fl. Pres. Madras 1319 (923). 1925.

Deciduous dioecious trees to 20 m, bark greyish-brown, smooth; young parts tomentose or glabrous. Leaves simple, opposite, 6-20 x 9-15 cm, broadly ovate or deltoid, apex acuminate to cuspidate or caudate-acuminate, base truncate, subcordate or cordate, margin entire, glabrous above, glaucous beneath, chartaceous; 3-ribbed from base, prominent, lateral nerves 3-6 pairs, prominent, intercostae scalariform, faint; stipules inter petiolar, 2-3 x 1 mm, linear lanceolate; petiole 3-12 cm long, slender, glabrous, unequal at each node. Flowers unisexual, pale green. Male flowers; 3-5 mm across, numerous on 10-20 cm long peduncle; bracts ca. 3 mm across, ovate-lanceolate, pubescent; pedicels 4-5 mm long; tepals globose, ovate, splitting into 3-4 broad, concave, often reflexed segments, 4-7 x 3-4 mm; stamens many, clustered on a convex receptacle; filaments 1.5-3 mm long, free, slender; anthers oblong. Female flowers; 5-9 mm across, 4-5 on axillary racemes; pedicels 5-10 mm long, finely hairy; tepals 3-5, 4-5 mm long, broadly ovate, densely tomentose beneath, caducous; ovary superior, 3-4 mm across, 2-4-loculed, ovule one in each cell; styles 3, 1.5-3 cm long, spreading, connate below, oblong. Fruit a capsule 2-3 cm across, woody, dark brown, broadly rounded, 3-4 loculed, pericarp very thick; seeds globose, ovoid.

Chavachi, KVB 31610; Pothanplavu, NS & KVB 31330

Fl. & Fr.: May-November

Distribution: Fairly common in Evergreen forests of Chavchi, Semi-evergreen forests of Pothanplavu and Paripode near River banks.

DAPHNIPHYLLACEAE

DAPHNIPHYLLUM Blume, Bijdr. 17: 1152.

Daphniphyllum neilgherrense (Wight) K. Rosenth. in Engl., Pflanzenreich. Daphniphyllac. 7. 1919; Gamble, Fl. Pres. Madras 1311(917). 1925; Ratheesh

Narayanan, Fl. Stud. Wayanad Dist. 733. 2009. *Goughia neilgherrensis* Wight, Ic. tt. 1878 & 1879. 1852. *Daphniphyllum glaucescens* Muell.-Arg. in DC., Prodr. 16: 3. 1866, non Blume 1826-1827; Hook. f., Fl. Brit. India 5: 353. 1887. *Daphniphyllum roxburghii* Baillon, Etude Euphorb. 565. 1858.

Trees, to 15 m, bark surface greyish-brown, smooth; exudation milky; branchlets stout. Leaves simple, alternate, clustered at the tip of branchlets, 3.5-12 x 1.5-5 cm, obovate, elliptic-obovate or obovate-oblong, apex acute or obtuse, base acute, margin entire, revolute, glabrous above and glaucous beneath, coriaceous; lateral nerves 5-10 pairs, slender, faint, intercostae reticulate, faint; petiole 5-25 mm, slender, glabrous. Flowers unisexual, yellowish-green, in axillary racemes. Male flowers: bracts 3 x 3 mm, ovate, obtuse, ciliate; tepals 5, minute; stamens 5-12, free; anthers oblong; connective apiculate. Female flowers: bracteate, perianth similar to male flowers; ovary superior, imperfectly 2-celled; ovules 2 in each cell; stigmas thick, recurved, undivided. Fruit a drupe, 10-12 mm long, ovoid, greenish-red.

Ambalappara, KVB 31573

Fl. & Fr.: January-June

Distribution: Rare in Evergreen forests of Ambalappara.

URTICACEAE

- 1a. Trees or shrubs..... 2
- 1b. Herbs or subshrubs 5
- 2a. Plants with stinging hairs; inflorescence elongate cyme..... Dendrocnide
- 2b. Plants without stinging hairs; flowers on axillary fascicles or short peduncled spikes 3
- 3a. Leaves white tomentose below Debregeasia
- 3b. Leaves not white tomentose below 4
- 4a. Flowers sessile, leaves 3-ribbed at base Bohmeria
- 4b. Flowers short pedicelled, penni-nerved Oreocnide
- 5a. Plants with stinging hairs..... 6
- 5b. Plants without stinging hairs..... 7
- 6a. Leaves 3-7 lobbed, female flowers usually aggregated on globose heads..... Girardinia
- 6b. Leaves not lobbed, flowers on elongated peduncle Laportea
- 7a. Female flowers aggregated on fleshy receptacle 8
- 7b. Female flowers not aggregated on fleshy receptacle 10
- 8a. Leaves opposite, receptacle long peduncled..... Lecanthes
- 8b. Leaves alternate, receptacle sessile or shortly peduncled..... 9
- 9a. Leaves 3-ribbed at base, male and female flowers on fleshy receptacle.. Elatostema
- 9b. Leaves penni-nerved, male flowers in cymes Procris
- 10a. Flowers in peduncled cymes..... 11
- 10a. Flowers sessile cymose axillary clusters..... Pouzolzia
- 11a. Leaves opposite..... Pilea
- 11b. Leaves alternate..... Pellionia

BOEHMERIA Jacq., Enum. Pl. Carib. 9. 1760.

Boehmeria glomerulifera Miq. in Zoll., Syst. Veg. Ind. Archip. 101,104. 1854; Manilal & Sivar., Fl. Calicut 280. 1982; Ansari, Fl. Kasaragod Div. 359. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 435. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 757. 2009. *Boehmeria malabarica* Wedd., Arch. Mus. Hist. Nat. 8: 355. 1855-56; Hook. f., Fl. Brit. India 5: 575. 1888; Gamble, Fl. Pres. Madras 1387(970). 1928.

Shrubs to 2 m high; stem pilose. Leaves simple, alternate, to 15 x 8 cm, ovate, acuminate, serrulate, base rounded, pubescent below, glabrous above; lateral nerves 5-6 pairs, lowest pairs opposite, rib-like; petiole to 5 cm long. Flowers 10-20 together, axillary. Male flowers 2 mm across; perianth lobes 4, united below, glabrous; stamens 4, free. Female perianth lobes 4 or 5, hispid. Achenes 1.2 x 1 mm, obovoid, glabrous, stigma 2 mm long, persistent.

Fl. & Fr.: April-December

Distribution: Common in Evergreen forests of Moonamthode, Kattikkari and Chavachi; Semi-evergreen forests of Paripode.

DEBREGEASIA Gaud., Voyage Bonite Bot. Atlas t. 90. 1844.

Debregeasia longifolia (Burm. f.) Wedd. in DC., Prodr. 16:235. 1869; Ramach. & V.J. Nair, Fl. Cannanore Dist. 436. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 757. 2009. *Urtica longifolia* Burm. f., Fl. Ind. 197. 1768. *Debregeasia velutina* Gaud., Voy. Bonite Bot. t. 90. 1844-46; Hook. f., Fl. Brit. India 5: 590. 1888; Gamble, Fl. Pres. Madras 1389(971). 1928; Anil Kumar et al., Fl. Pathanamthitta 469. 2005. *Conocephalus niveus* Wight, Ic. t. 1959. 1853.

Shrubs; branchlets slender, densely shaggy-pubescent. Leaves simple, alternate, to 6 x 5 cm, ovate to oblong-lanceolate, acuminate, base acute or obtuse, serrulate, 3-ribbed, midrib with 4 pairs of lateral nerves, nervules reticulate, densely white tomentose below, scabrous above; petiole 3 cm long; stipules linear-lanceolate. Spike 4 mm across; peduncles 5 mm long; bracts and bracteoles ovate, ciliate; male perianth lobes 4, free, 1 mm long, ovate, densely woolly; stamens 4, free. Fruits globose, 4-5 mm across, fruiting perianth orange-yellow.

Chelachode, KVB 31222

Fl. & Fr.: December-April

Distribution: Fairly common in Evergreen forests of Moonamthode, Chelachode, Chavachi and Kattikkari.

DENDROCNIDE Miq., Pl. Jungh. 29. 1851.

Dendrocniide sinuata (Blume) Chew, Gard. Bull. Singapore 21: 206. 1965; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 758. 2009. *Urtica sinuata* Blume, Bijdr. 505. 1826. *Urtica crenulata* Roxb., Fl. Ind. 3: 591. 1832. *Laportea crenulata* (Roxb.) Gaud. in Freye., Voy. Bont. Bot. 498. 1826; Hook. f., Fl. Brit. India 5: 550. 1888; Gamble, Fl. Pres. Madras 1373(961). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 438. 1988; Mohanan & Sivad., Fl. Agasthyamala 642. 2002.

Large shrubs to small trees; branchlets terete, white, covered with soft stinging hairs. Leaves simple, alternate, to 20 x 10 cm, elliptic to oblong-lanceolate, acute at either ends, entire or crenate, lateral nerves 9 pairs; petiole to 6 cm long. Inflorescence axillary, peduncled cymes, branches dichotomous, to 20 x 20 cm. Flowers monoecious or dioecious; male perianth lobes 4 or 5, ovate, cupular; female perianth lobes 4, ovate, free, pubescent. Stamens 4, free; pistillode clavate. Ovary 1-celled, ovules solitary; style 4 mm long, puberulous, persistent. Achenes 6 mm, ovoid, white, glabrous.

Meenmutty, KVB 31299

Fl. & Fr.: November-January

Distribution: Common in Evergreen forests of Meenmutty, Chavachi, Chelachode, Kattikkari and Pothurumi.

ELATOSTEMA J.R.Forst. & G.Forst., Char. Gen. 53. 1775, *nom. cons.*

- 1a. Receptacle shortly peduncled *E. wightii*
- 1b. Receptacle sessile 2
- 2a. Branchlets zig-zag..... *E. surculosum*
- 2b. Branchlets not zig-zag..... *E. lineolatum*

Elatostema lineolatum Wight, Ic. t. 1984. 1853, var. lineolatum; Hook. f., Fl. Brit. India 5: 565. 1888; Gamble, Fl. Pres. Madras 1376(963). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 438. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 759. 2009.

Glabrous herbs with elongated stem. Leaves simple, alternate, oblong-lanceolate, apex caudate-acuminate, base rounded, slightly oblique, coarsely crenate-toothed, lateral nerves 7-9 pairs, slender, archingly joining along margin. Receptacle sessile, solitary; bracts obovate-obtuse; bracteoles linear.

Pothurumi, NS & KJD 25538

Fl. & Fr.: March-April

Distribution: Rare in Evergreen forests of Pothurumi.

Elatostema surculosum Wight, Ic. t. 2091. 1853; Hook. f., Fl. Brit. India 5: 572. 1888; Gamble, Fl. Pres. Madras 1377(963). 1928.

Gregarious, subsucculent, herbs on moist rocks, rooting below; branchlets to 25 cm, zig-zag. Leaves simple, alternate, obliquely lanceolate, to 6 x 2.5 cm, subtended by several very small leaves, margin deeply dentate, apex caudate; stipules lanceolate. Inflorescence axillary, 1.3 cm wide, subtended by bracts and bracteoles. Flowers unisexual. Male flowers: tepals 4, ovate, basally connate. Stamens 4. Female flowers: tepals 5; ovary 1-celled; ovule 1. Achene ovoid.

Pothurumi, KJD 22534

Fl. & Fr.: October-December

Distribution: Rare in Evergreen forests of Pothurumi.

Elatostema wightii Hook. f., Fl. Brit. India 5: 570. 1888; Gamble, Fl. Pres. Madras 1377(963). 1928; Sasidh., Fl. Periyar Tiger Reserve 384. 1998.

Small herbs; stems usually unbranched. Leaves simple, alternate, 10 x 3.5 cm, ovate, inequilateral, acuminate at apex, rounded at base, widely crenate, sessile; cystolith scarce. Male receptacle 8 mm across, peduncles 4 cm long, slender; bracts ovate, cuspidate; bracteole lanceolate; flowers many, tepals 4, free, 1.5 mm long, ovate, long-cuspidate; stamens 4, free. Female receptacle 8 mm across, sessile; bracts obovate, cuspidate, fimbriate.

Amabalappara, KJD 26127

Fl. & Fr.: August-September

Distribution: Rare in Evergreen forests of Ambalappara on moist tree trunks. Endemic to Western Ghats.

GIRARDINIA Gaud., in Freycinet Voyage Monde, Bot. 498. 1830.

Girardinia diversifolia (Link) Friis, Kew Bull. 36: 145. 1981; Ansari, Fl. Kasaragod Div. 359. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 438. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 760. 2009. *Urtica diversifolia* Link, Enum. Hort. Berol. 2: 385. 1822. *Girardinia heterophylla* Decne. in Jacq., Voy. 4: 151. t.153. 1844; Hook. f., Fl. Brit. India 5: 551. 1888 incl. var. palmata. *Girardinia leschenaultiana* Decne. in Jacq., Voy. 4: 152. 1844; Gamble, Fl. Pres. Madras 1372(960). 1928. *Girardinia zeylanica* Decne. in Jacq., Voy. 4: 152. 1844; Gamble, Fl. Pres. Madras 1373(960). 1928;

Manilal & Sivar., Fl. Calicut 279. 1982. *Girardinia heterophylla* Decne. var. *zeylanica* (Decne.) Hook. f., Fl. Brit. India 5: 551. 1888.

Subshrubs with white stinging hairs. Leaves alternate, 3-7-lobed, 8-15 x 10-17 cm, base cordate, lobes margin inciso-serrate, densely strigose, 3-ribbed from base; stipules to 1.5 x 1 cm, broadly oblong, auricled, acute; petiole to 10 cm long, reddish. Male flowers in axillary, cylindrical branched or unbranched spikes, white; tepals 4, 2 mm long, ovate, cucullate; stamens 4; pistillode globose. Female flowers in subterminal heads; tepals connate into a ventricose tube, 2-4-lobed; ovary flattened, ovate, style filiform. Achenes ca 3 mm across, compressed.

Kattikkari, NS & KJD 31967

Fl. & Fr.: October-January

Distribution: Fairly common in Evergreen forests of Kattikkari, Chavachi and Moonamthode.

LAPOTRTEA Gaud., in Freycinet Voyage Bot. 498. 1830. *nom. Cons.*

Laportea interrupta (L.) Chew, Gard. Bull. Singapore 21: 200. 1965; Manilal & Sivar., Fl. Calicut 279. 1982; Ansari, Fl. Kasaragod Div. 360. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 439. 1988; Subram., Fl. Thenmala Div. 357. 1995; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 761. 2009. *Urtica interrupta* L., Sp. Pl. 985. 1753. *Fleurya interrupta* (L.) Gaud., Voy. Uranie 12: 497. t.8. 1830; Hook. f., Fl. Brit. India 5: 548. 1888; Gamble, Fl. Pres. Madras 1372(959). 1928.

Erect monoecious annual herbs with stinging hairs. Leaves simple, alternate, 4-10 x 3-5 cm, broadly ovate, apex acuminate, base rounded or subcordate, margin coarsely serrate, sparsely hairy, membranous, 3-nerved from base; petiole to 8 cm long. Flowers in short, cymose clusters aggregated in slender lax, axillary spikes to 13 cm long. Male flowers: tepals 4, c. 1 mm long, ovate, concave; stamens 4, filaments unequal; pistillode linear, clavate. Female flowers: tepals 4, unequal, basally connate into a cup; ovary obliquely attached, ovoid, style lateral, filiform. Achenes c. 2 mm across, ovoid,

Chavachi, KJD 22600

Fl. & Fr.: June-September

Distribution: Fairly common in Evergreen forests of Chavachi and Kattikkari.

LECANTHUS Wedd., Ann. Sci. Nat., Bot. sér. 4, 1: 187. 1854.

Lecanthus peduncularis (Wall. ex Royle) Wedd. in DC., Prodr. 16: 164. 1869; Ramach. & V.J. Nair, Fl. Cannanore Dist. 439. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 760. 2009. *Procris peduncularis* Wall. ex Royle, Illustr. Bot. Himal. t.83. f.2. 1836. *Lecanthus wightii* Wedd., Ann. Sci. Nat. Bot. ser. 4, 1: 187. 1854; Hook. f., Fl. Brit. India 5: 559. 1888; Gamble, Fl. Pres. Madras 1374(961). 1928.

Fleshy herbs, sometimes rooting at nodes. Leaves in unequal pairs, 4 x 1.5 cm and 1 x 0.5 cm, ovate, base oblique, serrate, membranous, pilose; petiole to 1 cm, slender. Receptacle to 1 cm across; peduncles to 1.5 cm. Female flowers: perianth of 3 unequal lobes, one hooded, to 2 mm and the rest small, flat. Achenes oblong, red, flat.

Crossway, KJD 31875; Ambalappara NS & KJD 25504

Fl. & Fr.: June-October

Distribution: Common in Evergreen forests of Crossway, Monamthode, Pottichappara and Ambalappara.

OREOCNIDE Miq., Pl. Jungh. 1. 39. 1851.

Oreocnide integrifolia (Gaud.) Miq., Ann. Mus. Lugd.-Bat. 4: 306. 1869; Ramach. & V.J. Nair, Fl. Cannanore Dist. 439. 1988; Anil Kumar et al., Fl. Pathanamthitta 471. 2005. *Villebrunea integrifolia* Gaud., Voy. Bonite Bot. t. 91. 1844; Hook. f., Fl. Brit. India 5: 589. 1888; Gamble, Fl. Pres. Madras 1388(971). 1928.

Small trees. Leaves simple, alternate, to 17 x 6 cm, oblong-oblongate, entire, acuminate, base acute; nerves 4-6 pairs, lowest pairs basal, punctate, glabrous; stipule 1 cm long, lanceolate. Flowers in axillary fascicles, monoecious or dioecious; male perianth 1.5 mm long, 4-lobed, united below; female perianth 2 mm long, tubular, narrowed above, toothed; stamens 3-5; pistillode obovate; ovary adnate to perianth tube, 1-celled, ovule basal; style absent; stigma discoid, fimbriate. Achenes adnate to the perianth, embraced by fleshy bracteoles, to 4 mm across.

Ambalappara, *KJD 26147*

Fl. & Fr.: June-August

Distribution: Rare in Evergreen forests of Ambalappara.

PELLIONIA Gaud., in Freycinet Voyage Bot. 494, t 119. 1826, *nom. cons.*

Pellionia heyneana Wedd., Monogr. Urtic. 287. t.5. 1856; Hook. f., Fl. Brit. India 5: 561. 1888; Gamble, Fl. Pres. Madras 1380(965). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 440. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 761. 2009. *Elatostema ovatum* Wight, Ic. t. 1985. 1853, 'ovata'.

Subshrubs; stem arched, angled, densely lineolate. Leaves distichous, 20 x 6 cm, falcate-elliptic, inequilateral, acuminate, acute at base, 3-ribbed; cystolith many, linear; petiole 1.5 cm long. Flowers in axillary peduncled cymes; peduncles stout, erect, to 15 cm long. Male flowers pedicelled, perianth reddish, lobes 4, equal, 2 mm long, oblong; stamens 4, free. Female flowers pedicelled, in short lateral congested cymes; peduncle to 1.5 cm long; perianth reddish, lobes 5, unequal, oblong to 1.5 mm long. Achenes 0.6 x 0.5 mm, obovate, acute, biconvex, tubercled.

Pothurumi, *NS & KVB 31415*

Fl. & Fr.: May-September

Distribution: Fairly common in Evergreen forests of Pothurumi, Chavachi and Kattikkari.

PILEA Lindl., Collect. Bot. ad. t. 4. 1821, *nom. cons.*

1a. Leaves entire; plants below 15 cm high..... *P. microphylla*

1b. Leaves serrate; plants more than 20 cm high..... *P. melastomoides*

Pilea melastomoides (Poir.) Blume, Mus. Bot. Lugd.-Bat. 2: 54. 1856; Anil Kumar et al., Fl. Pathanamthitta 472. 2005. *Urtica melastomoides* Poir. in Lam., Encycl. Suppl. 4: 223. 1816. *Pilea trinervia* (Roxb.) Wight, Ic. t. 1973. 1853; Hook. f., Fl. Brit. India 5: 557. 1888; Gamble, Fl. Pres. Madras 1379(964). 1928. *Urtica trinervia* Roxb., Fl. Ind. 3: 582. 1832.

Dioecious subshrubs, glabrous. Leaves simple, opposite, to 19 x 9 cm, ovate, acuminate, rounded at base, serrate, 3-ribbed, nervules parallel, pubescent along nervules below; lineoles crowded; petiole unequal in opposite pairs, to 10 cm long. Male panicle 10 cm across, axillary; flowers sessile, 4 mm across; perianth lobes 4, ovate, acute; stamens 4. Female panicle 2 cm across,

shortly peduncled. Flowers smaller than male flowers; perianth lobes 1 mm long, stigmas 3-fid. Achenes 1 mm across,

Mullenpara, NS & KJD 31978

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Mullenpara and Kattikkari.

Pilea microphylla (L.) Liebm., Vidensk. Selsk. Skr. 5:296. 1851; Gamble, Fl. Pres. Madras 1379(965). 1928; Manilal & Sivar., Fl. Calicut 279. 1982; Ansari, Fl. Kasaragod Div. 360. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 440. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 762. 2009. *Parietaria microphylla* L., Syst. Nat. (ed.10):1308. 1759. *Pilea muscosa* (L.) Lindl., Coll. Bot. t. 4. 1821; Hook. f., Fl. Brit. India 5: 551. 1888.

Slender succulent herbs; branches and leaves bifarious; stem transparent. Leaves simple, opposite, 4 x 3 mm, ovate-orbicular, apex obtuse, base attenuate, subsucculent, 1-nerved; raphides transverse; petiole to 1 mm long. Flowers monoecious in small umbellate clusters, 1-1.5 mm across. Male flowers: tepals 4, free, concave, obtuse; stamens 4. Female flowers: tepals connate, 2-4-toothed; ovary c. 0.5 mm long, ovoid, 1-celled; ovule 1. Achene c. 1 mm long, ellipsoid.

Kariyenkappu, NS & KJD 31998

Fl. & Fr.: August-November

Distribution: Fairly common in Plantations of Kariyenkappu.

POUZOLZIA Gaud., in Freycinet Voyage Bot. 503. 1826.

1a. Leaves petiolate; herbs *P. zeylanica*

1b. Leaves sessile; subshrubs *P. wightii*

Pouzolzia wightii Bennett, Pl. Jav. Rar. 1: 66. 1838; Wight, Ic. t. 2093. f. 8. 1853; Hook. f., Fl. Brit. India 5:584.1888; Gamble, Fl. Pres. Madras 1383(967). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 441. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 762. 2009.

Herbs; stem pilose. Leaves simple, opposite, 6.5 x 2.5 cm, ovate to elliptic, acuminate, 3-ribbed, hispid; stipule 8 x 6 mm, ovate. Spike to 35 cm long, terminal; bracts 12 x 8 mm, ovate, cordate at base. Flowers 3-6 together in the axils of bracts. Male and female flowers mixed. Male flowers hemispherical, truncate above, shortly pedicelled; perianth lobes 4, 2.5 mm long, ciliate; filaments puberulous. Female flowers sessile; perianth tube striate, hispid. Achenes 1.5 x 1 mm, ovoid, wingless.

Kannadivechakunnu, NS & KJD 31999

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Kannadivechakunnu. Endemic to Western Ghats.

Pouzolzia zeylanica (L.) Bennett, Pl. Jav. Rar. 1: 67. 1838; Manilal & Sivar., Fl. Calicut 280. 1982; Ansari, Fl. Kasaragod Div. 361. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 441. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 763. 2009. *Parietaria zeylanica* L., Sp. Pl. 1052. 1753. *Parietaria indica* L., Mant. Pl. 1: 128. 1767. *Pouzolzia indica* (L.) Gaud., Voy. Uranie 12: 503. 1830; Hook. f., Fl. Brit. India 5: 581. 1888; Gamble, Fl. Pres. Madras 1382(967). 1928.

Slender procumbent herbs. Leaves simple, alternate, 1.5-3 x 1-2 cm, ovate-elliptic, base rounded, apex acute, sparsely strigose, membranous, lateral nerves 3 or 4 pairs, basal pair opposite; petiole to 2 cm long. Flowers in axillary, subsessile clusters. Male flowers: 3-4 mm across; tepals 4, 1.5-2 mm long, ovate-

lanceolate, sparsely villous; stamens 4, filaments c. 2 mm long. Female flowers: tepals connate; style linear c. 2 mm long, thinly pubescent. Achenes 2-winged.

Ambalappara, *KJD 26153*

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Ambalappara.

PROCRIS Comm. ex. Juss., Gen. Pl. 403. 1789

Procris crenata Robins., Philipp. J. Sci. 5: 507. 1911; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 763. 2009. *Procris wightiana* Wall. ex Wedd., Monogr. Urtic. 336. 1856; Gamble, Fl. Pres. Madras 1378(963). 1928; Muktesh, Epiphytic Fl. Western Ghats 70. 1998. *Procris laevigata* sensu Hook.f., Fl. Brit. India 5: 575. 1888, non Blume 1825-1826.

Succulent herbs, usually epiphytic, stem erect or scandent. Leaves simple, alternate, 8 x 2.5 cm, elliptic-lanceolate, crenate, penni-nerved, cystolith linear; petiole 3 mm long; lower part of the stem with small orbicular nanophylls. Flowers monoecious, in axils of leaf scars; male flowers in small cymes; female flowers in peduncled receptacle; male perianth lobes 5, free, fleshy; female perianth lobes 3-5, free, fleshy, cucullate; stamens 5; ovary 1-celled, ovoid; ovule 1, basal; stigma sessile, globose. Achenes 1 mm long, ovoid, apiculate, rugose.

Kattikkari, *NS & KVB 31382*

Fl. & Fr.: October-January

Distribution: Common in Evergreen forests of Kattikkari, Pothurumi, Chavachi and Moonamthode.

ULMACEAE

1a. Leaves 3-ribbed from base; plants monoecious *Celtis*

1b. Leaves penni-nerved, plants dioecious *Trema*

CELTIS L., Sp. Pl. 1043. 1753.

Celtis timorensis Span., Linnaea 15: 343. 1841; Manilal, Fl. Silent Valley 257. 1988; Ramach. & V.J. Nair, Fl. Cannanore Dist. 429. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 764. 2009. *Celtis cinnamomea* Lindl. ex Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 303. 1848; Hook. f., Fl. Brit. India 5: 482. 1888; Gamble, Fl. Pres. Madras 1349(944). 1928. *Celtis trinervia* sensu Bedd., Fl. Sylv. t. 312. 1873, non Roxb. 1814.

Trees, to 15 m high, bark pale green, covered with small lenticels; young parts pubescent; branchlets angular. Leaves simple, alternate, 8-13 x 3-5.8 cm, oblong, ovate, lanceolate, oblong-ovate or elliptic-lanceolate, apex acuminate, base acute, cuneate or oblique margin entire or serrate along the upper half, chartaceous or subcoriaceous, glabrous above, ferruginous pubescent beneath, 3-ribbed from base, prominent; stipules lateral, lanceolate-subulate, caducous; petiole 3-5 mm long, slender; lateral nerves 1-2 pairs, pinnate, puberulous, faint, intercostae reticulate, faint. Flowers polygamous, 3-5 mm across; male flowers in short axillary racemose cymes; female flowers in more slender axillary cymes; tepals 4-5, linear, incurved, 1.7 mm, ciliate, acute; stamens 4-5, inserted round a woolly torus; filaments 1 mm; ovary 1 mm, superior, sessile, ellipsoid, 1-celled; style 4 mm. Fruit a drupe, 15 mm across, ovoid, narrowed towards tip, black.

Chavachi, *KVB 31516; KJD 26048*

Fl. & Fr.: January-March

Distribution: Rare in Evergreen forests of Chavachi.

TREMA Lour., Fl. Cochinch. 539, 562. 1790.

Trema orientalis (L.) Blume, Mus. Bot. Lugd.-Bat. 2: 62. 1856; Hook. f., Fl. Brit. India 5: 484. 1888; Gamble, Fl. Pres. Madras 1350(944). 1928; Manilal & Sivar., Fl. Calicut 274. 1982; Ansari, Fl. Kasaragod Div. 350. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 429. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 765. 2009. *Celtis orientalis* L., Sp. Pl. 1044. 1753. *Sponia wightii* Planch., Ann. Sci. Nat. Bot. ser. 3, 10: 322. 1848.

Dioecious trees, to 15 m high, bark 0.6 cm, thin, greyish or bluish-green, rough, lenticellate; branchlets scabrous to adpressed pubescent. Leaves simple, alternate, 7.5-15 x 2.5-6 cm, ovate-lanceolate, ovate or oblong-lanceolate, apex acuminate, base obliquely cordate, margin serrulate, scabrid above, tomentose beneath, chartaceous, 3-5-ribbed from base, prominent; stipules lateral, caducous; petiole 5-10 mm, slender, tomentose, grooved above; lateral nerves 3-4 pairs, pinnate, prominent, intercostae reticulate, prominent. Flowers unisexual, 3-4 mm across, greenish, in axillary fascicles or cymes; male flowers usually sessile; tepals 4 or 5, equal, 2 mm long, curved, ciliate; stamens 5; pistillode oblong; female flowers : tepals unequal, ciliate; ovary superior, sessile, 1-celled, ovate; style bifid, villous; stigma plumose. Fruit a drupe, 4 x 3 mm, globose, black; style tip persistent; seed globose.

Paripode KJD 22524

Fl. & Fr.: September-December

Distribution: Along forest boundaries at Paripode.

MORACEAE

- 1a. Flowers enclosed in syconia Ficus
- 1b. Flowers not enclosed in syconia 2
- 2a. Male flowers on disciform receptacles **3**
- 2b. Male flowers on globose or oblong heads; fruit a sorosis Artocarpus
- 3a. Small herbs; female flowers aggregated sunk in the fleshy receptacle Dorstenia
- 3b. Trees; female flowers solitary Antiaris

ANTIARIS Leschenault, Ann. Mus. Par. 16: 478, t. 22. 1810, *nom. cons.*

Antiaris toxicaria Lesch., Ann. Mus. Natl. Hist. Nat. Paris 16: 478, t.22. 1820; Hook. f., Fl. Brit. India 5: 537. 1888; Gamble, Fl. Pres. Madras 1367(957). 1928; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 766. 2009.

Lofty deciduous trees, to 50 m high; bole buttressed; bark 10-15 mm thick greyish-white, smooth, pustular-lenticellate, lenticels in vertical rows; exudation watery or milky. Leaves simple, alternate, bifarious, 6.5-15 x 2.5-5 cm, oblong, elliptic-oblong or ovate-oblong, apex acuminate or obtusely acuminate, base round, obtuse or cordate, margin entire or distantly crenulate, coriaceous, glabrous, scabrous beneath; lateral nerves 6-11 pairs, parallel, looped near the margin, prominent, intercostae reticulate, faint; stipule small, lateral, connate, caducous; petiole 3-8 mm long, stout, velvety. Flowers unisexual, greenish-yellow, minute, in spikes; male receptacle to 1.5 cm across, axillary, 3-4 together, tomentose; peduncle velvety; receptacle surrounded by imbricating bracts; tepals 3 or 4, spatulate, imbricate; stamens 3-8; filaments erect; anthers yellow; female flowers solitary in an involucre of few connate bracts, tepals absent; ovary superior, adnate to the involucre, 1-celled, ovule 1, pendulous; style arms 2, subulate, recurved. Fruit a drupe, 1.5-2.5 x 1-2 cm, pyriform or obovoid, fleshy, scarlet, velvety; seed 10-16 mm long.

Fl. & Fr.: January-April

Distribution: Rare in Evergreen forests.

ARTOCARPUS J. R. Forst. & J. G. A. Forst., *Charact. Gen.* 101. 1776, *nom. cons.*

- 1a. Fruit smooth, 2-5 cm across *A. gomezianus ssp. zeylanicus*
1b. Fruit echinate, more than 7 cm across 2
2a. Young shoots hirsute; male spike more than 8 cm long *A. hirsutus*
2b. Young shoots glabrous; male spike to 5 cm long *A. heterophyllus*

Artocarpus gomezianus Wall. ex Trecul **ssp. zeylanicus** Jarrett, J. Arnold *Arbor.* 41: 90. 1960; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 767. 2009. *Artocarpus lakoocha* sensu C.E.C. Fisch. in Gamble, *Fl. Pres. Madras* 1369(958). 1928, non Roxb. 1832; Mohanan & Sivad., *Fl. Agasthyamala* 627. 2002.

Medium sized to large trees, bark brownish black, pinkish inside; twigs grey adpressed tomentose. Leaves simple, alternate, to 16 x 8 cm, elliptic-oblong, acuminate, base truncate or subcordate, subscabrous below; lateral nerves 9-15 pairs, regularly arching below the margins, intercostae reticulate; petiole 1-2.5 cm long. Male spike globose, 8 mm across, peduncles 1 cm long. Syncarp subglobose, uneven, fleshy, greenish-yellow.

Paripode, *KJD 26319*

Fl. & Fr.: January-April

Distribution: Rare in Semi-evergreen forests of Paripode

Artocarpus heterophyllus Lam., *Encycl.* 3: 209. 1789; Manilal & Sivar., *Fl. Calicut* 278. 1982; Ansari, *Fl. Kasaragod Div.* 350. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 430. 1988; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 767. 2009. *Artocarpus integrifolius* Wight, *l.c.* t. 678. 1840; Hook. f., *Fl. Brit. India* 5: 541. 1888, non L.f. 1781; Gamble, *Fl. Pres. Madras* 1369(957). 1928.

Evergreen trees to 25 m high, bark 10-12 mm thick, blackish-grey, mottled with green and black, exfoliating in large thick flakes, exfoliated surface orange-red; exudation milky white latex; trunk with warty tubercles; branchlets glabrous. Leaves simple, alternate, 8-23 x 3-13 cm, obovate, obovate-oblong, or elliptic-ovate, apex acute or obtuse, base acute, round or cuneate, margin entire, glabrous and shining above and scabrous beneath; lateral nerves 6-8 pairs, pinnate, prominent, arched, intercostae scalariform, prominent; stipules 3-5 cm long, lateral, ovate-lanceolate, sheathing, glabrous, caducous; petiole 20-40 mm long, stout, grooved above, glabrous. Flowers unisexual, minute, yellowish-green, in spikes enclosed by spathe-like bracts, male from young branches, catkin narrow-cylindric; perianth 2-lobed, puberulous; stamen 1; filament somewhat flattened, stout; anthers ovate-oblong; female catkins from the trunk and mature branches, more massive, perianth with strongly projecting conical apex; ovary 0.3 mm, superior, globose-obovoid; style exerted; stigma spathulate. Fruit a sorosis 30-45 x 20-25 cm, oblong, tuberculate, tubercles conical yellowish-green, fruiting perianth yellow to light orange, fleshy; seeds 10-12 x 8-10 mm, elliptic-oblong, smooth, glossy.

Kattikkari, *KJD 18763*

Fl. & Fr.: November-April

Distribution: Fairly common in Evergreen forests of Kattikkari, Ambalappara, Moonamthode and Chavachi; Plantations of Kariyenkappu.

Artocarpus hirsutus Lam., Encycl. 3: 210. 1789; Hook. f., Fl. Brit. India 5: 541. 1888; Gamble, Fl. Pres. Madras 1369(957). 1928; Manilal & Sivar., Fl. Calicut 278. 1982; Ansari, Fl. Kasaragod Div. 351. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 430. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 767. 2009.

Evergreen trees, to 45 m high, bark 10-15 mm thick, surface dull grey-brown, smooth, lenticellate, exfoliations thin, exfoliated surface red, fibrous; exudation milky white, sticky, branchlets hirsute. Leaves simple, alternate, 13-25 x 7.5-15 cm, broadly ovate, obovate or elliptic, apex subacute or very shortly acuminate, base acute, obtuse or round, margin entire, undulate, coriaceous, glabrous above, hirsute-pubescent beneath; stipules to 4 cm long, lateral, densely tawny strigose; petiole 10-30 mm long, stout, hirsute; lateral nerves 6-12 pairs, pinnate, prominent; intercostae scalariform, faint. Flowers unisexual, minute, yellowish-green; male in axillary, pendulous, narrowly cylindrical spikes upto 15 cm long; tepals 2, united below; stamen 1; anther exerted, ovate, bracteoles chaffy; female flowers in axillary ovoid spikes; perianth tubular, confluent below with the receptacle; ovary superior, straight, ovule pendulous; style exerted; stigma undivided. Fruit a sorosis 6-7.5 cm across, globose or ovoid, echinate, yellow when ripe, the spines cylindrical, straight, hispid, perforate at the apex for filiform style; seeds 16-18 mm long, ovoid, white.

Kariyenkappu, *KJD 31874*

Fl. & Fr.: December-March

Distribution: Common in Plantations of Kariyenkappu.

Endemic to Western Ghats.

DORSTENIA L., Sp. Pl. 121. 1753.

Dorstenia indica Wall. ex Wight, Ic.t.1964. 1853; Hook. f., Fl. Brit. India 5: 494. 1888; Gamble, Fl. Pres. Madras 1370(958). 1928; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 768. 2009.

Herbs. Leaves simple, alternate, to 9 x 2.5 cm, obovate or oblanceolate, acute, base attenuate or cuneate, membranous, distantly toothed, sparsely hirsute along the nerves beneath, nerves 8-13 pairs; petiole 1 cm long. Flowers monoecious, many, on obconical receptacle. Receptacle axillary, solitary, discoid, 5-angled, to 1.5 cm across, marginal lobes to 0.5 cm long; peduncles to 2 cm long. Male flowers towards the periphery of the receptacle; perianth connate and adnate with receptacle; stamens 3. Female flowers grouped at the centre; ovary sunken in the tissue of the receptacle; style lateral, stigmas 2. Fruit an achene, sunken in the receptacle.

Kattikkari, *KVB 31633*

Fl. & Fr.: February-April

Distribution: Fairly common in Evergreen forests of Kattikkari.

FICUS L., Sp. Pl. 1059. 1753.

- 1a. Leaves opposite; branchlets hollow inside *F. hispida*
1b. Leaves alternate; branchlets solid inside 2
2a. Figs on main trunk or often on leafless branches *F. racemosa*
2b. Figs not on main trunk, axillary to leaves 3

- 3a. Figs sessile.....*F. drupacea* var. *pubscens*
 3b. Figs pedicelled 4
 4a. Figs less than 6 mm across; peduncle less than 3 mm long.....*F. arnottiana*
 4b. Figs over 12 cm across; peduncle more than 6 mm long..... 5
 5a. Upper leaf surface very scabrous, lateral nerves 5-7 pairs*F. exasperata*
 5b. Upper leaf surface glabrous or glabrescent, lateral nerves more than 8 pairs 6
 6a. Figs with 3 persistent bracts at the base; stipules over 3 cm long*F. beddomei*
 6b. Figs without 3 persistent bracts; stipules less than 1.5 cm long*F. nervosa*

Ficus arnottiana (Miq.) Miq., Ann. Mus. Lugd.-Bat. 3: 287. 1867; Hook. f., Fl. Brit. India 5: 513. 1888; Gamble, Fl. Pres. Madras 1363(953). 1928; Ansari, Fl. Kasaragod Div. 353.1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 769. 2009. *Urostigma arnottiana* Miq. in Hook.'s London J. Bot. 6: 564. 1847.

Deciduous independent trees, to 10 m high, aerial roots absent; bark surface grey-brown, smooth, tuberculate-lenticellate; latex milky. Leaves simple, alternate spiral, 6-20 x 5-13 cm, broadly ovate, apex caudate-acuminate, base deeply cordate, margin entire, slightly undulate, glabrous, coriaceous; stipules 3-5 cm long, lateral, reddish-green, glabrous, caducous, leaving annular scars; 5-7-ribbed from base, lateral nerves 5-8 pairs, pinnate, slender, prominent, intercostae reticulate, prominent; petiole 3-10 cm long, slender, not articulated, glabrous. Flowers unisexual; inflorescence a syconia, in axillary pairs or crowded near the apex, sessile or shortly pedunculate, globose, glabrous, orifice plane; bracts 3, 1 x 2-2.5 mm, ovate, thin, eventually caducous; flowers of 4 kinds; tepals red, more or less gamophyllous, 3-4 lobed, fleshy; male flowers sessile, around the orifice and sparsely scattered in the interior of the syconia; stamens 1, subsessile; anthers 2-celled, ovate-oblong, dehiscence longitudinally; female flowers sessile, sparsely scattered in the interior of syconia, cream, somewhat reddish on stylar side; ovary superior, depressed globose; style filiform; stigma flat gall flowered stalked; neutar flowers few. Synconium yellowish-brown when ripe; 5-7 mm across; achenes smooth.

Kariyenkappu, *KJD* 26377

Fl. & Fr.; December-April

Distribution: Rare in Plantations of Kariyenkappu and Evergreen forests of Meenmutty.

Ficus beddomei King, Ann. Roy. Bot. Gard. (Calcutta) 1: 26. tt. 24 & 81 M. 1887; Hook. f., Fl. Brit. India 5: 513. 1888; Gamble, Fl. Pres. Madras 1364(954). 1928; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 770. 2009.

Evergreen trees, epiphytic or independent, to 30 m high; aerial roots none; bark pale brown, smooth; exudation milky white. Leaves simple, alternate, 15-25 x 8-15 cm, broadly ovate, apex caudate acuminate, base acute, truncate or round, margin entire, slightly undulate, glabrous, coriaceous; stipules 5-10 cm long, lateral, leafy, golden yellow, glabrous, leaving an annular scar; 3-ribbed from base; lateral nerves 10-15 pairs, parallel, prominent, looped near the margin, intercostae reticulate, obscure; petiole 5-10 cm long, stout, grooved above, glandular at apex below, glabrous. Flowers unisexual; inflorescence a syconia, in axillary pairs, ovoid or obovoid, with several vertical ridges, green, glabrous; peduncle 1.5-2 cm long, stout, angled; basal bracts 3, 6-7 x 3-4 mm, ovate-lanceolate, shortly connate, reflexed, persistent; orifice slightly raised, internal bristles linear, glabrous; fig wall thick; flowers of 4 kinds; male flowers mixed with female through out the receptacle; pedicel

short; perianth cupular, 2-3 lobed, lobes unequal, brownish, glabrous; stamen 1; filament twisted, 2 mm, decurrent with the stalk of the ovary; anther 2-celled, 2 mm; female and gall flowers similar; pedicel short; tepals 4-5, lanceolate, unequal, brownish, glabrous, ovary 2 x 1.5 mm, superior, globose obovoid, blackish-brown on stylar side; style straight or curved, 2 mm, tapering. Syconium 1.5-2.5 cm across, green, spotted with yellow when ripe; achenes 2.5 x 1.8 mm, obovoid, smooth.

Chavachi, *KJD 26378*

Fl. & Fr.: July-February

Distribution: Rare in Evergreen forests of Chavachi. Endemic to Western Ghats.

Ficus drupacea Thunb. **var. pubescens** (Roth) Corner, Gard. Bull. Singapore 17: 381. 1960 & 21: 13. 1965; Manilal & Sivar., Fl. Calicut 276. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 771. 2009.

Ficus mysorensis Heyne ex Roth in Roem. & Schult., Syst. Veg. 1: 508. 1817; Hook. f., Fl. Brit. India 5: 500. 1888; Gamble, Fl. Pres. Madras 1361(952). 1928. *Ficus mysorensis* Heyne ex Roth var. *pubescens* Roth in Roem. & Schult., Syst. Veg. 1: 508. 1817; Hook. f., Fl. Brit. India 5: 500. 1888; Gamble, Fl. Pres. Madras 1361(952). 1928.

Trees to 25 m high; aerial roots often numerous, arising in tufts from the stout branches; bark surface greyish-brown, smooth; exudation milky; young shoots brown pubescent. Leaves simple, alternate, spiral, subdistichous, 10-22 x 6-15 cm, ovate or elliptic-ovate, apex abruptly acuminate, base round or subcordate, margin entire, tender leaves tomentose below, glabrous above and scurfy tomentose beneath when mature, coriaceous; 3-5-ribbed from base, lateral nerves 9-13 pairs, parallel, prominent beneath, intercostae reticulate, prominent; stipule 10-25 mm long, lateral, broadly lanceolate, tomentose; petiole 1.2-3.5 cm long, stout, grooved above, glandular at apex below, tomentose. Flowers unisexual; inflorescence a syconium, sessile, in axillary pairs, ellipsoid-globose, thick walled, tomentose without, at first covered by stout conical tomentose stipule; basal bracts 3, 2-6 mm, orbicular, concave, brown-pilose without, obtuse, orifice umbonate, closed by 3-4 apical bracts, not forming a flat disc; internal bristles a few; flowers of 4 kinds; male flowers disperse, numerous; pedicel to 4 mm long; tepals 2-3, free, brown, acute; stamen 1, exserted; filament sessile; tepals 3-4, free, brown, acute, ovary superior, obovoid, 0.7 mm, brown; style filiform 2 mm; gall flowers pedicellate; pedicel 0.2-3.5 mm; tepals 3, free; ovary obovoid; style short, subterminal. Syconium 1.5-2 cm across, orange-red when ripe; achene smooth.

Pookundu, *NS & KJD 25556*

Fl. & Fr.: March-April

Distribution: Rare in Semi-evergreen forests of Pookundu.

Ficus exasperata Vahl, Enum. Pl. 2: 197. 1805; Manilal & Sivar., Fl. Calicut 275. 1982; Ansari, Fl. Kasaragod Div. 355. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 432. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 772. 2009. *Ficus asperrima* Roxb., Fl. Ind. 3: 554. 1832; Hook. f., Fl. Brit. India 5: 522. 1888; Gamble, Fl. Pres. Madras 1366(955). 1928.

Deciduous trees, to 18 m high; aerial roots none; bark 5-6 mm thick, greenish-white, smooth, punctiform lenticellate, fibrous; exudation watery; all parts coarsely and harshly scabrid with stout white hairs. Leaves simple, laxly

alternate spiral to opposite or subdistichous, 5.5-19 x 3-9 cm, elliptic, ovate, oblong-lanceolate, or obovate, apex acute to shortly acuminate, basal acute, round or cuneate, margin denticulate or sinuate-crenate to serrate, scabrid on both surfaces, with out, coriaceous; 3-ribbed from base, glands at nerve axils, lateral nerves 3-6 pairs, pinnate, prominent, intercostae scalariform; stipules short, paired, lateral, caducous; petiole 1-6.5 cm long, slender, not articulated. Leaves of saplings and coppice shoots often lobed. Flowers unisexual; inflorescence a syconia, axillary, solitary, harshly scabrid; peduncle to 1.5 cm with 2-3 small scattered, lateral bracts, sometimes more or less aggregated into a collar, body subglobose or ellipsoid with scattered small lateral bracts, apical bracts projecting 1-2 mm; internal bristles copious, white, shorter than flowers; flowers of 4 kinds; male flowers sessile, ostiolar, in 1-2 rings; tepals 3-6, oblong-spathulate, white hairy; stamen 1; filament 0.5 mm; anther oblong, parallel; female flowers sessile; tepals 4-7, linear-spathulate, white hairy; ovary superior, obovoid; style filiform, lateral, puberulous, stigma clavate; gall flowers sessile to pedicellate tepals 4-6, lanceolate, white hairy, ovary white, sessile, style terminal, puberulous, stigma dilated. Syconium 0.7-1.5 x 1-1.5 cm, yellow or purple when ripe; achene oblong, slightly keeled, reticulate.

Narikkadavu, NS & KVB 31457

Fl. & Fr.: February-May

Distribution: Fairly common in Semi-evergreen forests of Pookundu and Narikkadavu.

Ficus hispida L. f., Suppl. Pl. 442. 1781; Hook. f., Fl. Brit. India 5: 522. 1888; Gamble, Fl. Pres. Madras 1367(956). 1928; Manilal & Sivar., Fl. Calicut 275. 1982; Ansari, Fl. Kasaragod Div. 356. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 432. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 749. 2009. *Ficus oppositifolia* Roxb., Pl. Corom. t.124. 1799.

Trees, to 10 m high laxly branched; bark grey, smooth; exudation milky; young shoots hispid; internodes of branchlets hollow. Leaves simple, opposite, 7-20 x 6-10 cm, oblong, obovate, elliptic-oblong, ovate-oblong or obovate-oblong, apex abruptly acute or acuminate or cuspidate, base round, subcordate or cuneate, margin subentire to minutely dentate, membranous, scabrid, hispid-pubescent; stipules 11-15 mm long, interpetiolar, ovate-lanceolate, caducous, often in whorls of 4 on the receptacles with leafless branches; 3-5-ribbed from base, lateral nerves 5-6 pairs, pinnate, prominent, intercostae scalariform, prominent; petiole 1-4 cm long, stout, hispid, with a subnodal gland. Flowers unisexual; inflorescence a syconia, dioecious, fascicled on trunk or on elongated pendulous or trailing leafless branches, depressed-globose, base narrowed, sticky pubescent without, faintly ribbed; peduncle 5-15 mm long, stout; basal bracts 3, 1-1.5 mm long, subtriangular, orifice slightly raised, closed by 5-6 apical bracts and numerous small inner bracts; internal bristles absent, appressed lateral bracts when present 2-4 mm wide; male flowers and gall flowers in same receptacle; female flowers in separate; male flowers ostiolar, in 2 rings; tepals 3 broad; stamen 1, subsessile; anther oblong, parallel, unequal; female flowers sessile or stalked; perianth short, tubular to 2 mm, glabrous; ovary depressed-globose, superior, red-brown; style 1.5 mm long, hairy; stigma clavate; gall flowers same as female but larger and distinctly stalked. Syconium 2-2.5 cm across, yellow; achenes 1.5 mm, lenticular, keeled with prominent hilum.

Moonamthode, KJD 31873

Fl. & Fr.: September-May

Distribution: Fairly common in Evergreen forests of Moonamthode and Chavachi.

Ficus nervosa Heyne ex Roth in Roem. & Schult., Syst. Veg. 1: 513. 1817; Hook. f., Fl. Brit. India 5: 512. 1888; Gamble, Fl. Pres. Madras 1364(954). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 432. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 773. 2009. *Ficus angustifolia* Roxb., Fl. Ind. 3: 554. 1832.

Evergreen trees, to 30 m high, bole buttressed; buttresses to 6 m high; bark 10-12 mm thick, grey to greyish-brown, often mottled with black, smooth; latex scanty, white, turning to yellow soon. Leaves simple, alternate, spiral, pinkish-brown when young, 6-17.5 x 4-8 cm, elliptic, oblong-lanceolate, ovate-elliptic or oblanceolate, apex acute or acuminate, base round or acute, margin entire, or slightly undulate, glabrous, glossy, coriaceous; 3-5-ribbed from base, glandular at basal nerve axils beneath; lateral nerves 5-12 pairs, pinnate, prominent, looped near the margin, intercostae reticulate, prominent; stipule 10-12 mm long, lateral, ovate-lanceolate, membranous, puberulous, caducous, leaving an annular scar; petiole 10-25 mm long, stout, grooved above, glabrous. Flowers unisexual; inflorescence a syconia, axillary and on twigs behind the leaves, paired or solitary, 8-15 mm across, subpyriform, hard, orifice circular, depressed, closed by 3 flat, apical scales, internal bristles 0; peduncle to 1 cm, slender, basal bracts 0 but 3 small, free, round-ovate pubescent bracts low down on the peduncle; flowers unisexual, of 4 kinds; male flowers few, only near the mouth of receptacle, pedicelled, tepals 2-3, red, free; stamen 1, filaments as long as the anther, adnate to one sepal; anther broadly oblong, mucronate; female flowers rarely pedicelled, sepals 3, lanceolate, red, style filiform, stigma bifid; gall flowers pedicellate; sepals 3, elongate, acuminate, ovary superior, ovoid, smooth; style short. Syconium depressed globose, red, glabrous, to broadly round to truncate, on elongate stalks; achenes smooth.

Chavachi, NS & KVB 31318

Fl. & Fr.: March-May

Distribution: Rare in Evergreen forests of Chavachi.

Ficus racemosa L., Sp. Pl. 1060. 1753; Manilal & Sivar., Fl. Calicut 275. 1982; Ansari, Fl. Kasaragod Div. 357. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 433. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 774. 2009. *Ficus glomerata* Roxb., Pl. Corom. t. 123. 1799; Hook. f., Fl. Brit. India 5: 535. 1888; Gamble, Fl. Pres. Madras 1364(954). 1928.

Deciduous trees, to 30 m high; bole buttressed; bark 8-10 mm thick, surface reddish-brown or yellowish-brown smooth, coarsely flaky, fibrous; latex milky; young shoots and twigs finely white hairy, soon glabrous; branchlets 1.5-3 mm thick, puberulous. Leaves simple, alternate, 6-15 x 3.5-6 cm, ovate, obovate, elliptic-oblong, elliptic-lanceolate, elliptic-ovate or oblong-ovate, apex narrowed, blunt or acute, base acute, obtuse or cuneate, margin entire, membranous, glabrous, blistered appearance on drying; 3-ribbed from base, 4-8 pairs, slender, pinnate, prominent beneath, intercostae reticulate, obscure; stipules 12-18 mm long, lanceolate, linear-lanceolate, pubescent, often persistent on young shoots; petiole 10-50 mm long, slender, grooved above, becoming brown scurfy. Flowers unisexual; inflorescence a syconia, on

short leafless branches or warty tubercles of trunk or on larger branches, subglobose to pyriform, smooth, often lenticellate-verrucose; peduncle 3-12 mm long, stout, orifice plane or slightly sunken, closed by 5-6 apical bracts; internal bristles none; basal bracts 3, 1-2 m long, ovate-triangular, obtuse, persistent; flowers of unisexual, 4 kinds; male flowers near the mouth of receptacles, in 2-3 rings, sessile, much compressed; tepals 3-4, dentate-lacerate, lobes jointed below, red, glabrous; stamens 2, exserted; filaments 1 mm, connate below; anthers oblong, parallel; female flowers sessile or very shortly stalked among gall flowers; tepals 3-4, dentate-lacerate, lobes jointed below, red, glabrous, ovary superior, sessile or substipitate, red spotted; style 2-3 mm long, glabrous, simple; stigma clavate; gall flowers long stalked; ovary dark red, rough; style short. Syconium 2.5 x 2 cm, orange, pink or dark crimson; achene granulate.

Kariyenkappu, *KJD 31857*

Fl. & Fr.: February-May

Distribution: Rare plantations of Kariyenkappu

ORCHIDACEAE

1a. Terrestrial plants	2
1b. Epiphytic or lithophytic plants	17
2a. Plants leaf less; saprophytes	3
2b. Plants with leaves; autophytes	4
3a. Lip spurred, flowers white speckled with pink.....	Epipogium
3b. Lip saccate, not spurred, flowers yellow.....	Aphyllorchis
4a. Leaf develops after flowering.....	Nervilia
4b. Leafy during flowering.....	5
5a. Plants with pseudobulb.....	6
5b. Plants without pseudobulbs	8
6a. Flowers spurred.....	Calanthe
6b. Flowers not spurred, lip sometimes saccate	7
7a. Inflorescence originate from base of pseudobulb, decurved	Geodorum
7b. Inflorescence originate from top of new pseudobulb	Acanthephippium
8a. Plants without underground tubers or tuberoid roots	9
8b. Plants with underground tubers; rhizome erect or creeping.....	13
9a. Lip superior	10
9b. Lip inferior.....	12
10a. Column long, curved, winged towards apex	Liparis (p.p.)
10b. Column short, not winged, mid lobe of lip dentate.....	11
11a. Side lobes of lip auricled.....	Malaxis
11b. Side lobes lacking, sides of lip laciniate.....	Seidenfia
12a. Sepals free	Zeuxine
12b. Sepals connate half way into a tube.....	Cheirostylis
13a. Spurs 2 from back of the superior lip.....	Satyrium
13b. Spur single or absent	14
14a. Lip adnate to the whole face of the column, bearing an appendage which over-top the anther; lateral sepals connate	Disperis
14b. Lip adnate only to the base of the column; lateral sepals free	15
15a. Flowers pink; lip obcordate.....	Brachycorythis
15b. Flowers white, yellow or yellowish green	16
16a. Sepals subequal, Stigma lobes not free	Peristylus
16b. Sepals unequal, stigma lobes free	Habenaria
17a. Leaves equitant	Oberonia
17b. Leaves not equitant	18
18a. Lip not spurred, sometimes saccate	19
18b. Lip spurred	30

19a. Flowers with a mentum	20
19b. Flowers without a mentum	21
20a. Mentum formed by the lateral sepals and foot of the column	Dendrobium
20b. Mentum formed by the lip and the foot of the column	Kingidium
21a. Column foot present	22
21b. Column foot absent	25
22a. Lip clawed, joined to the foot	Bulbophyllum
22b. Lip sessile	23
23a. Sepals connate at base to form a tube; usually one flowered	Porpax
23b. Sepals free; inflorescence one to many flowered	24
24a. Pseudobulbs inconspicuous, discoid	Conchidium
24b. Pseudobulbs conspicuous, ovoid or globose	Eria
25a. Bracts imbricating, convolute, almost concealing the flowers	Pholidota
25b. Bracts not imbricating, not concealing the flowers	26
26a. Leaves terete	Luisia
26b. Leaves flat	27
27a. Scapes terminal; column long, curved	Liparis (p.p.)
27b. Scapes lateral; column very short	28
28a. Pseudobulb absent	29
28b. Pseudobulb present, ovoid or subglobose	Coelogyne
29a. Robust plants; leaves keeled; flowers brownish	Cottonia
29b. Small plants, leaves not keeled, flowers white or pinkish	Sirhookera
30a. Plants leafless during flowering	Taeniophyllum
30b. Plants leafy during flowering	31
31a. Column foot distinct	Aerides
31b. Column foot absent	32
32a. Spur longitudinally septate almost to the mouth	Cleisostoma
32b. Spur not longitudinally septate	33
33a. Sepals and petals narrowed to the base,	Gastrochilus
33b. Sepals and petals not narrowed to the base, leaves terete	Seidenfadeniella

ACANTHEPHIPIUM Blume ex Lindl., Bijdr. 353. 1825.

Acanthephippium bicolor Lindl., Bot. Reg. 20. t.1730. 1835; Hook. f., Fl. Brit. India 5: 815. 1890; Gamble, Fl. Pres. Madras 1426(997). 1928; Abraham & Vatsala, Introd. Orchids 272. 1981; Sathish & Manilal, Orchid Memories 164. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 782. 2009.

Terrestrial herbs; pseudobulbs ovoid, 5-14 x 2-5 cm. Leaves 2 or 3, 20-40 x 6-12 cm, broadly lanceolate, acuminate. Flowers yellow with purplish red, 3.5 cm across, in 2-5-flowered racemes from the top of new pseudobulbs; bracts 3.5 x 3, cymbiform. Sepals fused to form gibbous tube; dorsal sepals 3.2 x 1.1 cm, oblong, obtuse; lateral sepals as long as or broader than dorsal sepal, fused with the foot along their inner edges forming the base of the pitcher, obtuse, recurved at apex. Petals 3.1 x 1.5 cm, spatulate, obtuse. Lip 3-lobed, 1.5 x 2 cm, lateral lobes erect, rounded; midlob recurved, oblong-spathulate, obtuse, disc 3-lamellate.

Kattikkari, *KJD 26317*

Fl. & Fr.: March-April

Distribution: Rare in the Evergreen forests.

AERIDES Lour., Fl. Cochinch. 2: 525. 1790.

Aerides crispa Lindl., Gen. Sp. Orchid. Pl. 239. 1833; Hook. f., Fl. Brit. India 6: 45. 1890; Gamble, Fl. Pres. Madras 1442(1008). 1928; Abraham & Vatsala, Introd. Orchids 446. 1981; Ansari, Fl. Kasaragod Div. 367. 1985; Sathish &

Manilal, Orchid Memories 165. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 783. 2009. *Aerides lindleyana* Wight, Ic. 5:9, t.1677. 1852.

Epiphytic herbs, sometimes lithophytic. Stem 20-30 cm high, 1-1.5 cm diam, older stem covered with persistent sheaths of petioles. Leaves 10-20 x 2-3 cm, linear-oblong, unequally 2-lobed at tip, sheathing at base, keeled along midrib, deciduous above sheathing petiole. Inflorescence simple or branched racemes; Peduncles 10-20 cm long; floral bracts minute, scaly. Flowers pink, 1.5-1.8 cm across. Sepals and petals 0.7-0.8 x 0.3-0.4 cm. Petals slightly smaller. Lip 1.5-1.8 x 0.3-0.4 cm, lobed; side lobes very small, mid-lobe ovate-crenulate. Pedicel and ovary 0.8-1.2 cm long.

Ambalappara, NS & KVB 31417

Fl. & Fr.: May-September

Distribution: Fairly common in the Evergreen forests at Ambalappara. Endemic to Western Ghats.

APHYLLORCHIS Blume, Bijdr. t. 77. 1825.

Aphyllorchis montana Rchb.f., Linnaea 41: 57. 1877; Hook. f., Fl. Brit. India 6: 116. 1890; Gamble, Fl. Pres. Madras 1457(1019). 1928; Mohanan et al., Journ. Bombay Nat. Hist. Soc. 79: 234. 1982; Sathish & Manilal, Orchid Memories 166. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 784. 2009. *Aphyllorchis prainii* Hook.f., Fl. Brit. India 6: 117. 1890; Ramach. & V.J. Nair, Fl. Cannanore Dist. 447. 1988; Vajr., Fl. Palghat Dist. 467. 1990.

Saprophytes, 50-60 cm tall. Flowers yellow, 3 x 1 cm, racemose; bracts 10 x 2 mm, linear lanceolate. Dorsal sepal 13 x 4 mm, oblong, obtuse; lateral sepals 11 x 3 mm, oblong, obtuse. Petals 11 x 3 mm, oblong, obtuse. Lip 9 x 5 mm, ovate, acute, 3-lobed, side lobes obliquely ovate-obtuse; midlobe ovate, acute.

Vellachatamkunnu, KJD 31470

Fl. & Fr.: August-September

Distribution: Rare in Evergreen forests of Vellachatamkunnu and Kannadivechakunnu.

BRACHYCORYTHIS Lindl.

Brachycorythis iantha (Wight) Summerh., Kew Bull. 1955: 238. 1955; Abraham & Vatsala, Introd. Orchids 254. 1981; Sathish & Manilal, Orchid Memories 167. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 785. 2009. *Platanthera iantha* Wight, Ic. t. 1692. 1851. *Platanthera affinis* Wight, Ic. t. 1693. 1851. *Habenaria galeandra* Benth., Hook. f., Fl. Brit. India 6: 163. 1890. *Phyllomphax obcordata* (D. Don) Schltr., Feddes Repert. 4: 119. 1919; Gamble, Fl. Pres. Madras 1476(1031). 1928.

Unbranched terrestrial herbs. Leaves 2.5-3 x 0.9-1.1 cm, elliptic-oblong, acute, 3-nerved, well spaced. Flowers pink, 1.5 x 1 cm. Dorsal sepal 4.5 x 2 mm, ovate-lanceolate, acute, 3-veined; lateral sepals 7 x 2.5 mm, falcate, ovate-oblong, acute, 3-veined. Petals 5 x 1.5 mm, lanceolate, obliquely acute at apex, 1 or 2-veined. Lip 14 x 12 mm, obcordate with a large sinus, sac ovate, obtuse, 2 x 2 mm, biparted.

Ambalappara, KJD 26126

Fl. & Fr.: July-August

Distribution: Fairly common in the Grasslands of Ambalappara.

BULBOPHYLLUM Du Petit-Thou., Hist. Pl. Orch., tabl. esp. 3 sub u. 1822,
nom. cons.

- 1a. Inflorescence umbellate..... *B. acutiflorum*
1b. Inflorescence racemose..... 2
2a. Side lobes of lip represented by 2 auricles..... *B. rosemarianum*
2b. Side lobes without auricles..... *B. sterile*

Bulbophyllum acutiflorum A. Rich., Ann. Sci. Nat. Bot. ser. 2, 15: 18. t. 7. 1841; Rao, Cons. Wild. Orch. Kodagu W. Ghats 193. 1998; Sathish & Manilal, Orchid Memories 167. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 786. 2009. *Cirrhopetalum acutiflorum* (A. Rich.) Hook. f., Fl. Brit. India 5: 779. 1890; Gamble, Fl. Pres. Madras 1421(993). 1928. *Cirrhopetalum albidum* Wight, Ic. t. 1653. 1851. *Bulbophyllum albidum* (Wight) Hook. f., Fl. Brit. India 5: 757. 1890; Gamble, Fl. Pres. Madras 1418(992). 1928; Sathish & Manilal, Orchid Memories 168. 2004.

Epiphytic herbs; rhizome stout, pseudobulbs broadly ovoid, 1-1.5 cm long. Leaf elliptic-oblong, 2.5-6 cm long, obtuse, emarginate, narrowed into a short petiole. Scape rather stout, slender, as long as or longer than the leaf; sheaths 2-3. Flowers umbellate, 4-8, cream-coloured, speckled with pale-brown, 1.3-2 cm long; bracts 4 mm long, lanceolate; pedicel longer, slender. Sepals lanceolate, acuminate, dorsal 1/3 shorter. Petals broadly oblong 3-nerved, rounded, lip clawed, basal angles acute. Lip usually tongue-shaped, sessile or clawed, jointed on the foot, mobile, usually small and much recurved. Column short, often 2-aristate at the top. Anthers 2-celled, pollinia 4 (rarely 2).

Ambalappara, KJD 25441

Fl. & Fr.: March-July

Distribution: Rare in the Evergreen forests of Ambalappara. Endemic to South India.

Bulbophyllum rosemarianum Sathish & Saleem, Rheedeia 11: 97. 2001; Sathish & Manilal, Orchid Memories 170. 2004.

Epiphytic herbs with creeping rhizomes; pseudo bulbs 1.7-3.5 x 1.1-1.6 cm, quadrangular, pale yellowish green, arranged distantly on a thick and wiry rhizome, rooted below and 1-leaved. Leaves 5-18 x 1.6-3.2 cm, erect, oblong, thick and fleshy, deeply channeled in the middle region, narrowed at the base, obtuse at apex; petiole short. Inflorescence from the base of pseudo bulb, pale green, longer than leaf with 5.5-9.2 cm long scape bearing 4 cup-like sterile bracts and a short raceme (4-5 cm) of pale yellow flowers. Dorsal sepal 4-5 x 3-3.5 mm, ovate-elliptic, truncate-angulate, 5-veined, acute at apex, joined only at the central part at base leaving side-margins free; lateral sepals 8-9 x 4-4.5 mm, ovate-elliptic or boat-shaped, 5-veined, margins folded inwards, lower edges slightly connate near base, attached to column-foot at sides, acute at apex. Petals 2-2.5 x 1.5-2 mm, broad-based, ovate-aristate, slightly oblique and erose at margins, gland-dotted and 1-veined. Lip 3-3.5 x 1.5-2 mm, thick, yellow with brown markings, papillose throughout except the median furrow region, 3-lobed; side lobes represented by 2 auricles, ovate-oblong, attached to tip of column by a short ligament. Column 2-3 mm long, thick with 2 erects sharply pointed stielidia that raise above operculum. Column-foot about 2 mm long bearing lateral sepals on sides and lip a little below the apex. Fruits 2-2.5 x 0.7-1.2 cm, globose.

Kariyenkappu, NS & KJD 31986

Fl. & Fr.: January-March

Distribution: Fairly common on Evergreen forest trees at Kariyenkappu, Crossway and Chavachi. Endemic to southern Western Ghats.

Bulbophyllum sterile (Lam.) Suresh in Nicolson, Suresh & Manilal, Interpr. Hort. Malab. 298. 1988; Sathish & Manilal, Orchid Memories 171. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 790. 2009. *Epidendrum sterile* Lam., Encycl. 1: 189. 1783. *Bulbophyllum neilgherrense* Wight, Ic. t. 1650. 1851; Hook. f., Fl. Brit. India 5: 761. 1890; Gamble, Fl. Pres. Madras 1418(992). 1928; Abraham & Vatsala, Introd. Orchids 334. 1981; Manilal & Sivar., Fl. Calicut 284. 1982; Ansari, Fl. Kasaragod Div. 367. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 447. 1988.

Epiphytes; rhizome creeping, stolon-like. Pseudo-bulbs fleshy, yellowish-green, 2-3 cm long, conical-ovoid, faintly 4-angled. Leaves single, apical, sessile, 4-12 x 1.5-3 cm, elliptic-oblong, apex obtuse, coriaceous. Racemes lateral, 6-10 cm long, sheathing at base. Flowers brownish, c. 1 cm long, dense; bracts small, oblong-lanceolate. Lateral sepals 1 cm long, ovate-acuminate; dorsal sepal c. 5 mm long. Petals small; lateral petals ovate-triangular, awned. Lip dark red, 3-lobed, spurred at base, mid-lobe thick, grooved dorsally, fleshy, laterals membranous. Column short, produced above into 2 teeth.

Kariyenkappu, NS & KJD 31563

Fl. & Fr.: December-January

Distribution: Fairly common on Riverside trees and Plantations at Kariyenkappu and Chavachi. Endemic to Peninsular India.

CALANTHE R. Br., Bot Reg. 7: sub t. 573. 1821, *nom. cons.*

Calanthe sylvatica (Thouars) Lindl., Gen. Sp. Orchid. Pl. 250. 1833; Sathish in Manoharan et al., Silent Valley-Whispers Reason 197. 1999; Sathish & Manilal, Orchid Memories 171. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 791. 2009. *Centrosis sylvatica* Thouars, Orch. Iles. Aust. Afr. t. 35,36. 1822. *Bletia masuca* D. Don, Prodr. Fl. Nepal. 30. 1825. *Calanthe masuca* (D. Don) Lindl., Gen. Sp. Orchid. Pl. 249. 1833; Hook. f., Fl. Brit. India 5: 850. 1890; Gamble, Fl. Pres. Madras 1432(1001). 1928; Abraham & Vatsala, Introd. Orchids 265. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 448. 1988.

Terrestrial herbs; stem not pseudobulbous at base. Leaves many, 25-50 x 5-8 cm, ovate-lanceolate, acuminate at apex, attenuate at base to sheathing petiole, 10-15 cm long, 7-9 ribbed, plicate. Inflorescence terminal racemes, 30-60 cm high. Flowers towards tip of peduncle, basal portion with 2-3 tubular sheaths; floral bracts 1.5-2 cm long, 0.2-0.3 cm wide, clavate. Flowers 3-4 cm across. Sepals and petals ovate, 1.5-2 x 0.8-1 cm, purple. Lip 1.5-2 cm long, 3-lobed, side lobes small, mid-lobe 2 fid, deep violet; spur 2-2.5 cm long, slender. Pollinia 8, grouped in groups of 4. Column short. Capsule 2.5-3 x 1-1.5 cm, broadly oblong.

Pothurumi, KJD 18752

Fl. & Fr.: August-December

Distribution: Rare in the Evergreen forests of Ambalappara and Pothurumi.

CHEIROSTYLIS Blume, Bijdr. 413, t. 16. 1825.

- 1a. Leaves long petioled *C. parvifolia*
1b. Leaves sessile..... *C. flabellata*

Cheirostylis flabellata (A. Rich.) Wight, Ic. 16. 1851 (as *Monochilus flabellatum* t. 1727); Hook. f., Fl. Brit. India 6: 105. 1890; Gamble, Fl. Pres. Madras 1454(1017). 1928; Abraham & Vatsala, Introd. Orchids 194. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 448. 1988; Sathish & Manilal, Orchid Memories 172. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 791. 2009. *Goodyera flabellata* A. Rich., Ann. Sci. Nat. Bot. ser. 2, 15: 79. t. 12. 1841. *Monochilus flabellatum* Wight, Ic. t. 1727. 1851.

Slender terrestrial herbs, 5-10 cm high. Leaves 1-2.5 x 0.5-1 cm, ovate, acuminate at apex; petiole 1-1.5 cm long, sheathing on stem. Inflorescence terminal racemes, 5-6 cm high, with 2-3 subulate bracts on rachis; flowers at the top only. Floral bracts minute, subulate; pedicel twisted and flowers resupinate. Sepals connate to a tube, 0.25-0.3 cm long. Petals free. Lip 0.5-0.6 cm long; lateral lobes saccate; mid-lobe 2-fid, 3-sect on margins. Capsules subglobose, 0.45-0.5 cm diam.

Ambalappara, *KJD 25558*

Fl. & Fr.: October-May

Distribution: Rare in the Evergreen forests of Ambalapparar and Pothurumi.

Cheirostylis parvifolia Lindl., Bot. Reg. Misc. 25: 20. 1839; Sasidh., Fl. Periyar Tiger Reserve 407. 1998.

Terrestrial herbs, 10-20 cm high. Leaves 3-5, clustered towards apex, 1-2.5 x 0.6-0.9 cm, ovate, or ovate-lanceolate, acute, membranous, pinkish on drying, glabrous; petiole 1-2 cm long, sheathed. Flowers white, 6-8, in 10-12 cm long terminal pubescent raceme. Sepals and petals united into a tube, 3 mm; dorsal sepal 1 x 0.9 mm, ovate, obtuse, 1-veined; lateral sepals 0.9 x 0.6 mm, ovate, subacute. Petals 0.6 x 0.5 mm, obliquely oblanceolate, obtuse, 1-veined. Lip, 3 x 1-4 mm, bilobed, trifid, lobules 3 each, lanceolate, subacute, base saccate with 3-lobed calli.

Kannadivechakunnu, *KJD 25562*

Fl. & Fr.: October-January

Distribution: Rare in the Evergreen forests of Kannadivechakunnu.

CLEISOSTOMA Blume, Bijdr. 362. 1825.

Cleisostoma tenuifolium (L.) Garay, Bot. Mus. Leaflet. Harvard Univ. 23: 175. 1972; Sathish & Manilal, Orchid Memories 174. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 792. 2009. *Epidendrum tenuifolium* L., Sp. Pl. 952. 1753. *Sarcanthus peninsularis* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 3: 343. 1851; Hook. f., Fl. Brit. India 6: 67. 1890; Gamble, Fl. Pres. Madras 1447(1012). 1928; *Sarcanthus pauciflorus* Wight, Ic. t. 1747. 1851; Abraham & Vatsala, Introd. Orchids 471. 1981; Ansari, Fl. Kasaragod Div. 375. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 462. 1988.

Pendulous epiphytic herbs, 20-30 cm long. Leaves 10-12 x 0.5 cm, linear, strongly keeled, acute. Flowers yellow, in 3-6 cm long, leaf-opposed racemes. Dorsal sepal 4.5 x 1.2 mm, obovate-oblong, lanceolate, acute, 3-veined; lateral sepals 3 x 1 mm, elliptic, acute, 3-veined. Petals 3 x 0.8 mm, falcately-oblong, truncate, 1-veined. Lip 2 x 4 mm, 3-lobed, side lobes 1.5 x 1 mm, ovate, apiculate, midlobe, 2 x 1 mm, ovate, with 2 fleshy calli; spur 3 x 1 mm, oblong-ovoid.

Chavachi, *NS & KVB 31404*

Fl. & Fr.: July-August

Distribution: Common in Semi-evergreen and Moist deciduous forests of Valayamchal to Kariyenkappu, Meenmutty, Chavachi, Chelachode and Uruppukunnu.

COELOGYNE Lindl., Collect. sub t. 33. 1822.

- 1a. Pseudobulb prominently corrugated; midlobe of the lip, ovate-acute *C. nervosa*
1b. Pseudobulb not corrugated; midlobe of the lip suborbicular *C. odoratissima*

Coelogyne nervosa A. Rich., Ann. Sci. Nat. Bot. ser. 2, 15: 16. 1841; Gamble, Fl. Pres. Madras 1430(1000). 1928; Abraham & Vatsala, Introd. Orchids 285. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 449. 1988; Sathish & Manilal, Orchid Memories 175. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 794. 2009. *Coelogyne corrugata* Wight, Ic. t. 1639. 1851; Hook. f., Fl. Brit. India 5: 835. 1890.

Epiphytes with subglobose to ovoid wrinkled pseudobulbs. Leaves 2 per pseudobulb, 6-15 x 2-2.5 cm, oblong-lanceolate, acute; petiole 2-3 cm long. Flowers white, in 8-12 cm long, 3-4-flowered raceme from the middle of leaves; bracts 12 x 19 mm, ovate, acute. Dorsal sepal 26 x 9 mm, oblong or elliptic, acute, to apiculate, 9-veined; lateral sepals 29 x 9 mm, oblong-elliptic, acute, apiculate, 9-veined. Petals 27 x 9 mm, elliptic, acute at both ends, 5-veined. Lip 24 x 7-15 mm, ovate, acute, trilobed, side lobes, obliquely ovate.

Ambalappara, KVB 31726; KJD 25440

Fl. & Fr.: June-August

Distribution: Common in the Evergreen forests of Ambalappara.

Endemic to Western Ghats.

Coelogyne odoratissima Lindl., Gen. Sp. Orchid. Pl. 41. 1830; Hook. f., Fl. Brit. India 5: 834. 1890; Gamble, Fl. Pres. Madras 1430(1000). 1928; Abraham & Vatsala, Introd. Orchids 277. 1981; Sathish & Manilal, Orchid Memories 175. 2004. *Coelogyne angustifolia* A. Rich., Ann. Sci. Nat. Bot. ser. 2, 15: 16. 1841.

Epiphytes with pseudobulbous stems and long slender roots; pseudobulbs 1.7 x 1.4 cm, crowded, subglobose, formed at the bases of shoots after flowering, wrinkled when old, green, covered by hyaline sheaths. Leaves 1 or 2 to each pseudobulb, small at time of flowering, becoming larger and longer at fruiting, 3-10 x 0.8-1.3 cm, linear-lanceolate, acute, coriaceous, recurved and punctulate beneath. Flowering shoot arising from the base of the pseudobulb, with five imbricate basal sheaths and two small foliage leaves, from the centre of which emerges the terminal racemes bearing 2-4 flowers; peduncle 4.5 cm long with a single, brown, membranous, papery, sterile bract half-way; floral bracts 1.3-1.6 x 1.2 cm, orbicular-ovate, acute, membranous, persistent and about 12-veined. Flowers 3.5 cm across, very fragrant, white. Dorsal sepal 2.3 x 0.95-1.05 cm, oblong-lanceolate, subacute, 9-veined; lateral sepals oblong-lanceolate or oblong-ovate, 2.3 x 0.75 cm, 5-veined, all sepals ridged dorsally in the midline. Petals linear, 2.2 cm x 2.6 mm, acute, 3-veined. Lip 2.2 x 1.4 cm, 3-lobed, 9-veined; lateral lobes oblong, obtuse, erect; midlobe orbicular, apiculate, with three crisped ridges along the midline. Column 1.4 cm high, 3 mm broad, winged, bending over at the apex, mentum inconspicuous. Anther terminal, 2-loculed, 2.4 x 2 mm. Ovary with pedicel 9 mm long. Fruit a capsule, 1.5-2.7 x 1-1.4 cm, ellipsoid, 6-ribbed, pendulous at the ends of thick, elongated peduncles.

Ambalappara, KVB 31738

Fl. & Fr.: February-May

Distribution: Common in the Evergreen forests of Ambalappara.

CONCHIDIUM Griff., Not. Pl. Asiat. 3: 321. 1851.

Conchidium microchilos (Dalz.) Rauschert, Feddes Repert. 94: 444. 1983; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 796. 2009. *Dendrobium microchilos* Dalz., Hook.'s J.Bot. Kew Gard. Misc. 3: 34. 1851. *Eria microchilos* (Dalz.) Lindl., J. Proc. Linn. Soc. Bot. 3: 47. 1859; Sathish & Manilal, Orchid Memories 186. 2004.

Small pseudobulbus epiphytic herbs, Pseudobulbs discoid. Leaves 2-5, oblong-lanceolate. Scape slender often filiform, flowers in racemes. Flowers yellow or creamy yellow. Sepals and petals spreading. Lip narrowly oblong.

Ambalappara, KJD 25460

Fl. & Fr.: July-August

Distribution: Rare on wet rocks of Ambalappara.

COTTONIA Wight, Ic. t. 1755. 1852.

Cottonia peduncularis (Lindl.) Rchb.f., Cat. Orch. Schiller 52. 1857; Abraham & Vatsala, Introd. Orchids 456. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 450. 1988; Sathish & Manilal, Orchid Memories 176. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 797. 2009. *Vanda peduncularis* Lindl., Gen. Sp. Orchid. Pl. 216. 1833. *Cottonia macrostachya* Wight, Ic. t. 1755. 1851; Hook. f., Fl. Brit. India 6: 26. 1890; Gamble, Fl. Pres. Madras 1439(1006). 1928.

Epiphytes, 10-20 cm tall. Leaves few, spiral, closely packed, 8-10 x 1 cm, oblong, keeled, bilobed at apex. Flowers brown, in 20-40 cm long peduncle. Dorsal sepal 9 x 4 mm, obovate-oblong, obtuse, 7-veined; lateral sepals 8 x 4.5 mm, obovate-oblong, obtuse, 7-veined. Petals 8 x 3 mm, linear-oblong, obliquely truncate, 3-veined. Lip 1.2 x 10 mm, subpanduriformis, 2-auricled at base with interposed calli, lateral lobes orbicular, midlobe trifid, lateral lobules orbicular.

Chavachi, NS & KVB 31311

Fl. & Fr.: March-May

Distribution: Fairly common in the Evergreen forests of Chavachi.

DENDROBIUM Swartz in Nova Acta Regiae Soc. Sci. Upsal. 6: 70. 1799.

- 1a. Flowers on leafless stems 2
- 1b. Flowers on leafy shoots 3
- 2a. Flowers bright yellow; stem not fully covered with leaf sheath *D. nutans*
- 2b. Flowers white or white with rose tinge; stem fully covered,
with leaf sheath *D. heyneanum*
- 3a. Flowers racemose *D. herbaceum*
- 3b. Flowers fascicled *D. aphyllum*

Dendrobium aphyllum (Roxb.) Fischer in Gamble, Fl. Pres. Madras 1416(991). 1928; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 799. 2009. *Limodorum aphyllum* Roxb., Pl. Corom. 1: 34. 1795. *Dendrobium macrostachyum* Lindl., Gen., Sp. Orch. 78. 1830; Hook. f., Fl. Brit. India 5: 735. 1890; Gamble, Fl. Pres. Madras 1416(990). 1928; Abraham & Vatsala, Introd. Orchids 355. 1981; Manilal & Sivar., Fl. Calicut 285. 1982; Ansari, Fl. Kasaragod Div. 369. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 452. 1988; Sathish & Manilal, Orchid Memories 180. 2004.

Epiphytic herbs; stem to 40 cm long, terete. Leaves oblong or ovate-lanceolate, acute, to 8 x 2.5 cm. Flowers dull yellow, 2.5 cm long, 2 or 3 on

very short peduncles. Sepals and petals similar, oblong-lanceolate or obovate. Lip obscurely 3-lobed, lateral lobes enclosing the column, midlobe quadrately oblong, ovate, obtuse, with prominent red veins, margins crenulate.

Meenmutty, NS & KVB 31332

Fl. & Fr.: March-April

Distribution: Rare in the Evergreen forests of Meenmutty.

Dendrobium herbaceum Lindl., Bot. Misc. 69.1840; Hook. f., Fl. Brit. India 5:719.1890; Gamble, Fl. Pres. Madras 1416(990). 1928; Abraham & Vatsala, Introd. Orchids 368. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 451. 1988; Sathish & Manilal, Orchid Memories 179. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 801. 2009. *Dendrobium ramosissimum* Wight, Ic. t. 1648. 1851.

Epiphytic herbs; stem 30-40 cm long, branched, terete, leafless when flowering. Leaves 3-8 cm long, narrowly linear. Flowers white, in 4-6-flowered, 1-1.5 cm long, slender racemes from nodes; pedicel 6-7 mm. Dorsal sepal 5 x 1.5 mm, oblong-lanceolate, acute, 3-veined; lateral sepals 4 x 1.5-2 mm, oblong, subacute, apiculate, falcate, 3-veined. Petals 4 x 1 mm, subfalcately oblong, obtuse, apiculate, 1-veined. Lip 3 x 2 mm, side lobes ovate-orbicular; midlobe thick, orbicular, obtuse.

Chavachi, KVB 31671

Fl. & Fr.: December-January

Distribution: Fairly common in Evergreen forests of Chavachi, Meenmutty; Moist Deciduous forests of Paripode and Plantations of Kariyenkappu. Endemic to Peninsular India.

Dendrobium heyneanum Lindl., Gen. Sp. Orchid. Pl. 78. 1830; Hook. f., Fl. Brit. India 5: 718. 1890; Gamble, Fl. Pres. Madras 1415(990). 1928; Abraham & Vatsala, Introd. Orchids 358. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 452. 1988; Sathish & Manilal, Orchid Memories 179. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 802. 2009.

Epiphytic herbs; stem 15-20 cm long. Leaves 8-10 x 0.6-0.8 cm, linear, acute, sessile, sheathed at base. Flowers white or pinkish-white, in 8-10 cm long, 10-12 flowered, slender axillary or terminal racemes; pedicel 7 mm. Dorsal sepal 9 x 2 mm, oblong-lanceolate; acute, 5-veined; lateral sepals 9 x 2.5 x 3 mm, obliquely ovate-lanceolate, acute, 5-veined. Petals 9.5 x 1-1.5 mm, oblanceolate-linear, acute, 3-veined. Lip 12.5 x 4-6.5 mm, obovate, side lobes oblong-lanceolate, acute; midlobe, ovate, subacute, apiculate, margins dentate; disc with a fleshy callus.

Ambalappara, KVB 31737

Fl. & Fr.: August-December

Distribution: Fairly common in Evergreen forests at Ambalappara and Kattikkari. Endemic to Peninsular India.

Dendrobium nutans Lindl., Gen. Sp. Orchid. Pl. 90. 1830; Hook. f., Fl. Brit. India 5: 734. 1890; Gamble, Fl. Pres. Madras 1416(990). 1928; Abraham & Vatsala, Introd. Orchids 363. 1981; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 803. 2009. *Callista nutans* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 655. 1891. *Dendrobium jerdonianum* Wight, Ic. t. 1644. 1851; Hook. f., Fl. Brit. India 5: 734. 1888.

Epiphytic herbs; stem 15-30 cm long, clavate, narrowed at base, swollen towards tip; internodes 1.5-1.8 cm long, yellow on drying, ridged, black hairy on ridges. Leaves only at the tip of stem, 4-6 x 1-1.5 cm, linear-lanceolate to linear-oblong, inequally 2-fid at tip, sheathing at base. Flowers 3-4 in short tubercle like leaf opposed racemes; Peduncle 0.5-0.7 cm long; floral bracts scaly, c. 0.1 cm long. Flowers donot fully open. Sepals and petals 0.3-0.35 cm long, linear, lanceolate. Lip pink, fleshy, 1.5-1.25 cm long, 3-lobed; mentum stout, c. 0.5 m long. Pedicel and ovary 0.8-1.2 cm long. Pods 1.2-1.5 x 0.6-0.7 cm.

Ambalappara, *KVB 31581*

Fl. & Fr.: February-March

Distribution: Common in Evergreen forests of Ambalappara.

DISPERIS Swartz, Kongl. Vetensk. Acad. Nya Handl. 21: 214. 1800.

Disperis neilgherrensis Wight, Ic. t. 1719. 1851; Hook. f., Fl. Brit. India 6: 169. 1890; Gamble, Fl. Pres. Madras 1478(1032). 1928; Abraham & Vatsala, Introd. Orchids 208. 1981; Sathish & Manilal, Orchid Memories 185. 2004; Kurzweil, Blumea 50: 145. 2005; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 806. 2009. *Disperis zeylanica* Trimen, J. Bot. 23: 245. 1885; Hook. f., Fl. Brit. India 6: 169. 1890.

Terrestrial herbs with a tuber; stem 10-15 cm tall. Leaves to 10 x 9 mm, ovate, cordate, acute, sessile. Flowers pale-pink or rose, one or two in terminal raceme; floral bracts, foliaceous, 9 x 6 mm, cordate, acute. Dorsal sepal and petals connated to form a hood over the column; dorsal sepal 9 x 2 mm, linear-lanceolate, 3-veined; lateral sepals 16 x 7 mm, obliquely obovate, obtuse, many-veined. Petals 10 x 6 mm, obliquely obovate or elliptic, subacute, 3-veined. Lip 5 x 5 mm, anchor shaped, bifid, with two long linear recurved arms with yellow papillae.

Ambalappara, *KJD 26092*

Fl. & Fr.: May-July

Distribution: Rare in Evergreen forests of Ambalappara.

EPIPOGIUM R. Br., Prodr. 330, 331. 1810.

Epipogium roseum (D. Don) Lindl., J. Proc. Linn. Soc. Bot. 1: 177. 1857; Ramach. & V.J. Nair, Fl. Cannanore Dist. 453. 1988; Sathish & Manilal, Orchid Memories 185. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 807. 2009. *Limodorum roseum* D. Don, Prodr. Fl. Nepal. 30. 1825. *Epipogium nutans* Rchb.f., Bonplandia 5: 36. 1836; Hook. f., Fl. Brit. India 6: 124. 1890; Gamble, Fl. Pres. Madras 1460(1021). 1928 'Epipogum'. *Podanthera pallida* Wight, Ic. t. 1759. 1851.

Saprophytic tuberous herbs, 15-25 cm tall; tuber 2-3 x 2 cm, ovoid or oblongoid. Flowers white, speckled with pink spots, racemose. Dorsal sepal 9 x 1.4 mm, linear, subacute, obtuse, 3-veined; lateral sepals 10 x 1 mm, linear, subacute, 3-veined. Petals 9.5 x 2 mm, oblong-lanceolate, obtuse. disc with 2 rows of tubercles; spur 3 x 2 mm, saccate; column 4 x 1.2 mm; ovary 3.5 x 1.2 mm.

Kattikkari, *NS & KVB 31385*

Fl. & Fr.: April-November

Distribution: Rare in Evergreen forests of Kattikkari.

ERIA Lindl., Bot. Reg. 11: t. 904. 1825, *nom. cons.*

Eria albiflora Rolfe, Bull. Misc. Inform. Kew 1893: 170. 1893; Gamble, Fl. Pres. Madras 1425(996). 1928; Sathish & Manilal, Orchid Memories 185. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 807. 2009.

Small epiphytes, up to 5 cm. Pseudobulbs aggregate. Leaves oblong-lanceolate, attenuate, leafy when flowering. Flowers ca.6, white in brown pubescent slender scape. Sepals obliquely lanceolate-ovate. Petals linear-ovate. Lip sub-orbicular, beaked at tip, sparsely gland-dotted, with 2 lateral papillae at base.

Ambalappara, *KJD 25450*

Fl. & Fr.: June-September

Distribution: Rare, once collected from Evergreen forests of Ambalappara.

Endemic to Southern Western Ghats; Conservation status:Vulnerable.

GASTROCHILUS D. Don, Prodr. Fl. Nepal. 32. 1825.

1a. Midlobe of the lip finely crenate G. flabelliformis

1b. Midlobe of the lip irregularly fimbriate G. acaulis

Gastrochilus acaulis (Lindl.) O. Ktze., Rev. Gen. Pl. 2: 661. 1891; Sathish & Manilal, Orchid Memories 191. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 812. 2009. *Cleisostoma acaulis* Lindl., Gen. Sp. Orchid. Pl. 227. 1833. *Saccolabium acaule* (Lindl.) Hook. f., Fl. Brit. India 6: 61. 1890. *Vanda pulchella* Wight, Ic. t. 9. 1852. *Gastrochilus calceolare* (Buch.-Ham. ex Smith) D. Don, Prodr. Fl. Nepal. 32. 1825; Ramach. & V.J. Nair, Fl. Cannanore Dist. 455. 1988; *Saccolabium nilagiricum* Hook. f., Fl. Brit. India 6: 60. 1890. *Gastrochilus nilagiricus* (Hook.f.) O.Ktze., Rev. Gen. Pl. 2: 661. 1891; Ansari, Fl. Kasaragod Div. 369. 1985. *Gastrochilus pulchellus* (Wight) Schltr., Feddes Repert. 12: 215. 1913; Abraham & Vatsala, Introd. Orchids 466. 1981. *Saccolabium pulchellum* (Wight) C.E.C. Fisch., Gamble, Fl. Pres. Madras 1446(1011). 1928.

Epiphytic herbs; stem 2 cm high. Leaves 4-10 x 1 cm, oblong, obliquely bifid at apex. Flowers yellow, on 2 cm long, stout, lateral raceme. Dorsal sepal 8 x 3.5 mm, obovate, obtuse; lateral sepals 7.5 x 4 mm, elliptic, obtuse. Petals 7 x 3.5, obovate. Lip 7 x 8 mm, deeply saccate; epichile triangular, margins dentate with few papillae near centre.

Chavachi, *NS & KVB 31403*

Fl. & Fr.: October-January

Distribution: Fairly common in Evergreen forests at Kariyenkappu and Chavachi, on stream side trees.

Gastrochilus flabelliformis (Baltt. & McCann) Saldanha, Fl. Hassan Dist. 830. 1976; Abraham & Vatsala, Introd. Orchids 469. 1981; Sathish & Manilal, Orchid Memories 191. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 813. 2009. *Saccolabium flabelliformis* Blatt. & McCann, Journ. Bombay Nat. Hist. Soc. 35: 722. 1931.

Epiphytes. Leaves 3-4.5 x 1 cm, falcate with purple tinges, unequally bilobed at apex. Racemes to 1.5 cm long. Flowers ca 5 mm across. Sepals ca 1.5 x 1 mm, ovate. Petals ca 1 x 0.5 mm, spathulate yellow with red spots. Lip 3-lobed, saccate, 3 x 2 mm, side lobes obtuse, midlobe fan shaped, crenate, white. Column ca 1 mm dia, winged purple coloured, rostellum bifid. Pollinia 2, glandular, 0.1 mm, stipe narrow.

Fl. & Fr.: October-January

Distribution: Rare in Evergreen forests at Kattikkari and Plantations of Kariyenkappu. Endemic to Western Ghats.

GEODORUM Jack., in Andrews Bot. Repos. 10: t. 626. 1811.

Geodorum densiflorum (Lam.) Schltr., Feddes Repert. 4: 259. 1919; Gamble, Fl. Pres. Madras 1437(1004). 1928; Abraham & Vatsala, Introd. Orchids 327. 1981; Manilal & Sivar., Fl. Calicut 284. 1982; Sathish & Manilal, Orchid Memories 192. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 813. 2009. *Limodorum densiflorum* Lam., Encycl. 3: 516. 1792. *Geodorum purpureum* R. Br. in Ait.f., Hort. Kew. (ed. 2) 5: 207. 1813; Hook. f., Fl. Brit. India 6: 16. 1890. *Geodorum dilatatum* sensu Wight, Ic. t. 612. 1844, non R.Br. 1810; Hook. f., Fl. Brit. India 6: 17. 1890.

Terrestrial herbs, 60-70 cm tall; pseudobulbs ovoid, 5 x 2.5 cm. Leaves 30-50 x 7-10 cm, elliptic-oblong or lanceolate, acuminate. Flowers white or pinkish, raceme 50-60 cm long, from the base of the pseudobulb; flower bearing portion about 5 cm long, strongly decurved. Floral bracts 15 x 4 mm, lanceolate, acuminate, 1-3-veined. Dorsal sepal 13 x 4.5 mm, oblanceolate-oblong, acute, apiculate at apex, 5-veined; lateral sepals 13 x 5.1 mm, elliptic-oblong, acute, 7-veined. Petals 12.5 x 6 mm, oblanceolate, obtuse. Lip cymbiform, side margins incurved, apex faintly bilobed. Disc with longitudinal callus.

Kariyenkappu, *NS & KJD 25535*

Fl. & Fr.: April-July

Distribution: Rare in the Plantations at Kariyenkappu.

HABENARIA Willd., Sp. Pl. 4(1): 5, 44. 1805.

- 1a. Petals 2-paritite..... *H. digitata*
 1b. Petals entire..... 2
 2a. Floral bracts large, foliaceous *H. perrottetiana*
 2b. Floral bracts small to medium 3
 3a. Inflorescence second or subsecund, bracts cucullate..... *H. heyneana*
 3b. Inflorescence not second, bracts not cucullate *H. longicornu*

Habenaria digitata Lindl., Gen. Sp. Orchid. Pl. 307. 1835; Hook. f., Fl. Brit. India 6: 134. 1890; Gamble, Fl. Pres. Madras 1469(1026). 1928; Sathish & Manilal, Orchid Memories 193. 2004. *Habenaria trinervia* Wight, Ic. t.1701. 1852. *Habenaria travancorica* Hook. f., Fl. Brit. India 6: 135. 1890; Mohanan, Fl. Quilon Dist. 396. 1984. *Habenaria digitata* Lindl. var. *travancorica* (Hook. f.) C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1469(1026). 1928.

Terrestrial herbs; plants up to 30 (-50) cm, with stalked ovate tuberooids; stem stout, leafy. Leaves 5-7, sessile, largest and crowded in the middle of stem, orbicular to oblong-lanceolate, acute to acuminate, up to 10 x 4 cm, margin some what undulate. Inflorescence dense flowered; lower bracts foliaceous, the lower exceeding ovary, the upper equalling the ovary. Sepals green, the dorsal sub-orbicular-concave, 6 mm; lateral sepals obliquely ovate-lanceolate, 10 x 4 mm. Petals 2-parted nearly to the base, posterior lobe greenish, curved backwards and upwards, linear-lanceolate, sickle-shaped, anterior lobe whitish, filiform, curved backwards, 10-12 mm long, usually slightly longer than posterior. Lip deeply 3-parted, white at base, lobes subequal, narrow-linear, mid-lobe straight, 12-14 mm long, green towards the

apex, side-lobes spreading and curved backwards, slightly shorter than mid-lobe. Spur c.11 mm long, slightly shorter than ovary, inflated towards apex. Column 4-5 mm high. Anther canals short, curved upwards. Stigmatic processes clavate. Ovary glabrous.

Ambalappara, *KJD 25456*

Fl. & Fr.: August-November

Distribution: Rare in Evergreen forests at Ambalappara.

Habenaria heyneana Lindl., Gen. Sp. Orchid. Pl. 320. 1835; Hook. f., Fl. Brit. India 6: 148. 1890; Gamble, Fl. Pres. Madras 1471(1028). 1928; Abraham & Vatsala, Introd. Orchids 231. 1981; Sathish & Manilal, Orchid Memories 194. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 817. 2009. *Habenaria subpubens* A. Rich., Ann. Sci. Nat. Bot. ser. 2, 15: t. 4C.1841; Hook. f., Fl. Brit. India 6: 148. 1890. *Habenaria candida* Dalz. in Hook.'s J. Bot. Kew Gard. Misc. 2: 262. 1850.

Terrestrial herbs; stem 10-30 cm high. Leaves 4-6 x 0.5-0.9 mm, oblong-lanceolate, acute, cauline. Flowers white, on 3-5 cm long, secund spike; bracts 15 x 6 mm, ovate-lanceolate, acute, foliaceous. Dorsal sepal 9 x 4 mm, elliptic-oblong, acute, 5-veined; lateral sepals 10 x 3.5 mm, elliptic-oblong, obtuse-apiculate, 5-veined. Petals 8.5 x 4.5 mm, obliquely ovate-lanceolate, obtuse, 3-veined. Lip 10 x 6 mm, 3-lobed; lobes subsimilar; lateral lobes, 7 x 1.5 mm, obliquely oblong-lanceolate, obtuse; midlobe 7.5 x 2.5 mm, oblong-lanceolate, obtuse. Spur, 13 x 1 mm, cylindrical, subacute to obtuse.

Amabalappara, *KJD 25455*

Fl. & Fr.: August-October

Distribution: Common in the Grasslands and rare in Evergreen forests of Ambalappara. Endemic to Peninsular India.

Habenaria longicornu Lindl., Gen. Sp. Orchid. Pl. 322. 1835; Hook. f., Fl. Brit. India 6. 139. 1890; Gamble, Fl. Pres. Madras 1470(1027). 1928; Abraham & Vatsala, Introd. Orchids 229. 1981; Sathish & Manilal, Orchid Memories 195. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 818. 2009. *Habenaria montana* A. Rich., Ann. Sci. Nat. Bot. ser 2, 15: 73 t. 4A. 1841.

Terrestrial herbs; stem 10-40 cm high. Leaves to 12 x 2.5 cm, clustered towards the middle of the stem, linear-oblong, lanceolate, acute or acuminate. Scape to 25 cm tall. Flowers to 8, 2.5 cm across; bracts shorter than the 2.5 cm long ovary. Sepals ovate, acute. Petals linear-oblong, narrower. Lip 3-partite; side lobes 1.2 x 0.5 cm, cuneate, apex obliquely truncate, fimbriate; midlobe linear, shorter. Spur to 10 cm long, apex clavate.

Amabalappara, *KJD 25498*

Fl. & Fr.: August-October

Distribution: Rare at Evergreen forests of Ambalappara. Endemic to Peninsular India.

Habenaria perrottetiana A. Rich., Ann. Sci. Nat. Bot. 15. 74. t.4B.1841; Hook. f., Fl. Brit. India 6: 164. 1890; Gamble, Fl. Pres. Madras 1471(1028). 1928; Abraham & Vatsala, Introd. Orchids 236. 1981; Sathish & Manilal, Orchid Memories 197. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 818. 2009. *Platanthera lutea* Wight, Ic. t. 919. 1845.

Terrestrial herbs; stem 20-50 cm high. Leaves to 7 x 3 cm, elliptic-oblong, acute. Flowers yellow, few, in about 15 cm long spike; bracts 3 x 1.7 cm, broadly elliptic, acute-apiculate, foliaceous, almost concealing the flowers. Dorsal sepal 15

x 9 mm, ovate-oblong, obtuse, 5-veined; lateral sepals 15 x 9 mm, elliptic, obtuse, 7-veined. Petals 15 x 4 mm, obliquely oblong, acute, 4-veined. Spur 15 mm long, clavate.

Ambalappara, *KJD 25499*

Fl. & Fr.: August-October

Distribution: Rare in the Grasslands of Ambalappara. Endemic to South India.

KINGIDIUM Hunt, Kew Bull. 24: 97. 1970.

Kingidium mysorensis (Saldanha) Sathish in Sathish & Manilal, Cat. Indian Orch. 59.1994; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 821. 2009. *Phalaenopsis mysorensis* Saldanha, Indian For. 100: 571. t.3. 1974; Abraham & Vatsala, Introd. Orchids 464. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 460. 1988. *Kingidium niveum* Sathish in Sathish & Manilal, Cat. Indian Orch. 53. t.16. 1994; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 821. 2009.

Epiphytic herbs. Leaves 10-15 x 3.4 cm, oblong, lanceolate, acute. Flowers white, 6-10, in 15-20 cm long racemes. Dorsal sepals 8 x 4 mm, obovate, obtuse; lateral sepals 7 x 5 mm, ovate, acute. Petals 7.5 x 3 mm, obovate, obtuse. Lip 3-lobed, 6 x 5 mm; side lobes rounded; midlobe ovate, acute. Disc with a pair of antennae.

Paripode, *KJD 26187*

Fl. & Fr.: March-July

Distribution: Rare in Plantations of Kariyenkappu and Moist deciduous forests of Paripode. Endemic to South India.

LIPARIS L. C. Rich., Mem. Mus. Hist. Nat. 4: 43, 52. 1818, *nom. cons.*

- 1a. Epiphytic, leaves articulated *L. viridiflora*
1b. Terrestrial, leaves not articulated *L. wightiana*

Liparis viridiflora (Blume) Lindl., Gen. Sp. Orchid. Pl. 31. 1830; Abraham & Vatsala, Introd. Orchids 410. 1981; Ansari, Fl. Kasaragod Div. 370. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 456. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 823. 2009. *Malaxis viridiflora* Blume, Bijdr. 392. 1825. *Liparis longipes* Lindl., Gen. Sp. Orchid. Pl. 30. 1830; Hook. f., Fl. Brit. India 5: 703. 1890; Gamble, Fl. Pres. Madras 1411(987). 1928.

Epiphytic herbs; pseudobulb 8 x 2 cm, tapering towards apex. Leaves 2 per pseudobulb, 20-25 x 2 cm, linear, acuminate. Flowers creamy, in 20 mm long raceme. Dorsal sepal oblong acute, 1-veined; lateral sepals obliquely oblong, obtuse, 1-veined. Petals linear, acute, 1-veined. Lip 2.5 x 2 mm, oblong, acute, obtuse.

Kattikkari, *KJD 26037*

Fl. & Fr.: September-November

Distribution: Fairly common in Semi-Evergreen forests of Narikkadavu; Plantations of Kariyenkappu and Evergreen forests of Kattikkari.

Liparis wightiana Thw., Enum. Pl. Zeyl. 295. 1861; Hook. f., Fl. Brit. India 5: 695. 1890; Gamble, Fl. Pres. Madras 1410(986). 1928; Abraham & Vatsala, Introd. Orchids 405. 1981; Sathish & Manilal, Orchid Memories 201. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 824. 2009. *Liparis atropurpurea* sensu Wight, Ic. t. 904. 1844, non Lindl. 1830.

Terrestria herbs to 15 cm, base bulbous. Leaves to 5.5 x 2 cm, ovate, acuminate. Flowers yellowish with brown tinge, in about 4-8 cm long racemes; bracts 9 x 3.5 mm, lanceolate, acuminate. Dorsal sepal lanceolate, obtuse, 3-

veined; lateral sepals subfalcately lanceolate, acute, 3-veined. Petals linear, obtuse, 1-veined. Lip 7 x 6 mm, oblong-orbicular, auricled at base, disc with 2 tubercled calli, margins hairy.

Ambalappara, *KJD 25446*

Fl. & Fr.: August-September

Distribution: Rare near small streams in Evergreen forests at Ambalappara.

LUISIA Gaud., in Freycinet Voyage Monde, Uranie Physicienne Bot. 426. 1829.

Luisia tristis (G.Forst.) Hook.f., Fl. Brit. India 6: 25. 1890; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 826. 2009. *Epidendrum triste* G.Forst., Fl. Ins. Austr. 60. 1786. *Luisia zeylanica* Lindl., Fol. Orch. Luisia 3. 1853; Abraham & Vatsala, Introd. Orchids 486. 1981; Manilal & Sivar., Fl. Calicut 284. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 456. 1988; Sathish & Manilal, Orchid Memories 202. 2004. *Luisia teretifolia* Gaudich., Voy. Uranie 426. 1829; Hook.f., Fl. Brit. India 6: 22. 1890; Gamble, Fl. Pres. Madras 1438(1005). 1928. *Luisia truncata* Blatt. & McCann, Journ. Bombay Nat. Hist. Soc. 35: 491. t. 9. 1932.

Erect, tufted, epiphytic herbs; stem to 20 cm long. Leaves 4-10 cm long, terete, acute at apex, fleshy, sheathing at base. Inflorescence condensed racemes, extra-axillary. Flowers 2-4, 5-6 mm long, greenish-yellow with purple tinge; bracts 1.5-2 x 1-2 mm, oblong, obtuse. Sepals c. 5 x 1.5 mm, oblong, obtuse, apex incurved. Petals similar to sepals. Lip 4-6 mm long, oblong, concave towards the base, trilobed with dark maroon horizontal bands; mid-lobe rhomboid, larger than side lobes. Ovary c. 2 mm long. Fruits 1.5-3.5 cm long, oblong.

Katikari, *KJD 25588*

Fl. & Fr.: March-August

Distribution: Evergreen forests of Kattikkari.

MALAXIS Soland. ex Swartz, Prodr. 119. 1788.

Malaxis purpurea (Lindl.) O. Ktze., Rev. Gen. 2: 673. 1891; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 826. 2009. *Microstylis purpurea* Lindl., Gen. Sp. Orchid. Pl. 20. 1830. *Crepidium purpureum* (Lindl.) Szlach., Syst. Orch. 3: 131. 1995; Sathish & Manilal, Orchid Memories 176. 2004. *Malaxis acuminata* auct. non D. Don, 1825; Abraham & Vatsala, Introd. Orchids 396. 1981. *Microstylis wallichii* sensu Hook. f., Fl. Brit. India 5:686.1888,p.p. non Lindl. 1830; Gamble, Fl. Pres. Madras 1407 (985). 1928.

Terrestrial herbs, with swollen base. Leaves 7-8.5 x 2.5-3 cm, elliptic or ovate, acute. Scape about 20 cm; bracts 4 x 1 mm, lanceolate, acuminate, 1-veined. Flowers purple, 1 x 0.5 cm. Dorsal sepal obovate, obtuse, 5-veined; lateral sepals broadly ovate, obtuse, 5-veined. Petals linear, retuse at apex, 1-veined. Lip auricled, apex bilobulate, obtuse; margin with a constriction, subapically. Disc with purple oval fovea.

Ambalappara, *KJD 25447*

Fl. & Fr.: April-July

Distribution: Rare in Evergreen forests of Ambalappara.

NERVILIA Comm. ex Gaud., in Freycinet Voyage Monde, Bot. 421. 1829, *nom. cons.*

Nervilia infundibulifolia Blatt. & McCann, Journ. Bombay Nat. Hist. Soc. 35: 725. t. 3. 1932; Abraham & Vatsala, Introd. Orchids 435. 1981; Sathish & Manilal, Orchid Memories 203. 2004. *Nervilia hallbergii* Blatt. & McCann, Journ. Bombay Nat. Hist. Soc. 35: 726. 1932.

Terrestrial, tuberous herbs with a single leaf; tubers sub-globose, slightly flattened above, sparsely covered with small root-knobs, 8-10 mm across. Leaf flat on ground or slightly above surface, appearing after flowering; sheaths about 1-2 cm long, light brown, acute to subacuminate; lamina 2-3 x 3-4 cm, glabrous, broadly ovate, cordate to suborbicular, subacute, obtuse, or slightly retuse at the apex, margins brown-maroon, irregularly and minutely dentate-crenulate; nerves 5-7; upper surface dark green with broad chocolate-coloured bands along the nerves, lower surface light green with prominent dark-brown nerves. Scapes 6-15 cm long, 1-flowered; sheaths linear-oblong, obtuse, entire, 5-nerved. Flowers greenish-purple; bracts 3-7 x 2-3 mm, 3-nerved, maroon, the nerves deeper in colour; pedicels 1-1.5 mm long, curved, pale-purple. Sepals and petals light maroon-green with maroon veins. Sepals 13-15 x 3-4 mm, linear-lanceolate, broader in the middle, acute, 3-nerved. Petals 12-14 x 2-2.5 mm, linear-lanceolate, broader in the middle, acute, sparsely or not at all gland-dotted, 3-veined, the mid-nerve more prominent. Lip 16-17 x 5-6 mm, saccate at base, gland-dotted, 3 lobed; lateral lobes 8 x 2 mm, pale green, acute or subobtuse, entire, more or less embracing the column to form a tube, the latter about 3 mm broad at the mouth, narrower behind, midlobe 9-10 x 6-7 mm broadly obovate to even suborbicular, rounded, margin somewhat wavy, white or pink with deep patches of rose-maroon. Column 8 mm long, broad at the top. Anthers 3 x 2 mm, white or faintly tinged with purple-maroon in front. Ovary 4-5 x 3 mm, maroon, 6-keeled with alternate low and high ridges. Capsules 18 x 6 mm, elliptic, maroon.

Crossway, *KJD 26042*

Fl. & Fr.: February-July

Distribution: Rare in Evergreen forests at Crossway.

OBERONIA Lindl., Gen. Sp. Orchid. Pl. 15. 1830, *nom. cons.*

Oberonia wynadensis Sivad. & Balakr., Nordic J. Bot. 9: 395. 1989; Sathish & Manilal, Orchid Memories 209. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 837. 2009. *Oberonia pakshipadalensis* Muktesh & Stephen, J. Orchid. Soc. Ind. 12: 31. 1998.

Tufted pendulous acaulescent epiphytes. Leaves 1-17 x 0.5-1.6 cm, distichous, equitant, articulated at base; basal ones smaller, linear, ensiform, acute. Scape adnate to the upper leaf, compressed, 12-15 x 0.3-0.7 cm, with few sterile bracts at apex. Inflorescence 25-33 cm long, floral axis rounded to subtetragonal, ca. 2 mm diameter, tapering to the tip into a sterile tail. Flowers 4 in a whorl; maturation from tip of the inflorescence to the base; floral bracts 2-2.5 x 1.25-1.5 mm, ovate, oblong, erose-margined, acute at apex; pedicels ca. 1.5 mm long. Sepals and petals deflexed. Dorsal sepal 2.3-2.5 x 1.4-1.6 mm, ovate, oblong, obtuse, 1-nerved, glabrous; lateral sepals 2.2-2.3 x 1.5-1.75 mm, broadly ovate, 1-nerved, glabrous. Petals 2.5 x 0.5 mm, linear oblong, acute at apex, 1-nerved, glabrous. Lip 3.6-3.8 x 4.0-4.2 mm, quadrate, 3-lobed, 3-nerved, lateral lobes entire margined, encircle and overlap behind the column; midlobe 2-lobulate, 1.25-1.75 x 3.5-4.0 mm,

lobules orbicular with a quadrate sinus in between. Disc ovate, concave, glabrous. Column 0.75-1.0 x 0.5-0.7 mm, ovate, oblong. Pollinia 2, ovoid. Ovary ca 1.5-1.75 x 0.75-1.0 mm.

Ambalappara, NS & KJD 25516

Fl. & Fr.: August-January

Distribution: Rare in Evergreen forests of Ambalappara. Endemic to southern Western Ghats of Kerala.

PAPILIONANTHE Schitr., Orchis 9: 78. 1915.

Papilionanthe cylindrica (Lindl.) Seidenf., Descr. Epidendr. Koing 1791: 33. 1995; Sathish & Manilal, Orchid Memories 210. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 838. 2009. *Aerides cylindricum* Lindl., Gen. Sp. Orchid. Pl. 240. 1833; Hook. f., Fl. Brit. India 6: 44. 1840; Gamble, Fl. Pres. Madras 1442(1008). 1928; Abraham & Vatsala, Introd. Orchids 444. 1981. *Papilionanthe subulata* Pradhan, Indian Orch. 563. 1979, non (Koenig) Garay 1974.

Epiphytic herbs. Leaves to 10 x 0.2 cm, terete. Racemes extra axillary, opposite the leaves, 2-5-flowered; flowers white. Sepals 12 x 8 mm, ovate, obtuse at apex, fleshy. Petals 12 x 8 mm, broadly ovate, obtuse, fleshy. Lip yellow, 3-lobed, lobes equal, side lobes erect, middle lobes recurved; spur 8 mm, conical, obtuse at apex. Pedicels with ovary 1.5 cm. Fruit 4 cm long, slightly winged.

Amabalappara, KJD 26270

Fl. & Fr.: February-April

Distribution: Rare in Evergreen forests of Ambalappara.

PERISTYLUS Blume, Bijdr. 404, t. 30. 1825, *nom. cons.*

- 1a. Leaves clustered near the base of the stem *P. aristatus*
1b. Leaves scattered throughout the stem *P. richardianus*

Peristylus aristatus Lindl., Gen. Sp. Orchid. Pl. 300. 1835; Gamble, Fl. Pres. Madras 1474(1030). 1928; Abraham & Vatsala, Introd. Orchids 246. 1981; Ramach. & V.J. Nair, Fl. Cannanore Dist. 459. 1988; Sathish & Manilal, Orchid Memories 211. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 839. 2009. *Habenaria aristata* (Lindl.) Hook. f. in Trimen, Cat. Ceylon Pl. 91. 1885; Hook. f., Fl. Brit. India 6: 158. 1890, non King & Pantl, 1898.

Terrestrial herbs. Leaves 4-7 x 2 cm, elliptic-lanceolate, subacuminate. Flowers white, in 10-18 cm long, lax spike, peduncle 12-15 cm long; bracts 11.5 x 4 mm, lanceolate, acuminate, margins finely erose, 1-veined. Dorsal sepal 5 x 1.8 mm, elliptic-oblong, obtuse, 1-veined; lateral sepals 4.1 x 1.8 mm, obliquely ovate-oblong, obtuse, 1-veined. Petals 5.5 x 2.1-2.5 mm, oblanceolate-oblong, obtuse, 1-veined. Lip 5 x 2 mm, 3-lobed; lobes very unequal; lateral lobes 7.5-8 x 0.5 mm, linear, acute, midlobe 2.5 x 0.9 mm, oblong, obtuse. Spur 3.2 x 1.5 mm, ellipsoid, acute, with cylindrical stalk.

Ambalappara, KJD 25454, 25457, 25458, 26158

Fl. & Fr.: July-August

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthippara.

Peristylus richardianus Wight, Ic. t. 1697.1851; Gamble, Fl. Pres. Madras 1474(1030). 1928; Abraham & Vatsala, Introd. Orchids 246. 1981; Sathish & Manilal, Orchid Memories 212. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad

Dist. 840. 2009. *Peristylus robustior* Wight, Ic. t. 1699. 1851. *Habenaria bicornuata* Hook. f., Fl. Brit. India 6: 150. 1890.

Terrestrial herbs, 20-50 cm high. Leaves 5 x 1-1.5 cm, lanceolate, acuminate. Flowers creamy, in about 15 cm long dense spike. Dorsal sepal oblong, obtuse, keeled, 1-veined; lateral sepals oblong, obtuse, keeled, 1-veined. Petals elliptic-lanceolate, obtuse, 1-veined with 2 lateral veins from the middle. Lip 6 x 18 mm, 3-lobed; lobes unequal; midlobe 3 x 1 mm, oblong, obtuse; lateral lobes 8 x 0.5 mm, linear, upcurved. Spur clavate, acute at apex.

Ambalappara, NS & KJD 25512

Fl. & Fr.: August-October

Distribution: Fairly common in Evergreen forests of Ambalappara.

PHOLIDOTA Lindl. ex W. J. Hook., Exot. Fl. 2: 138. 1825.

Pholidota imbricata Hook., Exot. Fl. t. 138. 1825; Gamble, Fl. Pres. Madras 1431(1000). 1928; Ansari, Fl. Kasaragod Div. 374. 1985; Sathish & Manilal, Orchid Memories 213. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 841. 2009. *Pholidota pallida* sensu Abraham & Vatsala, Intr. Orch. 288. 1981, non Lindl. 1836; Ramach. & V.J. Nair, Fl. Cannanore Dist. 460. 1988.

Epiphytes with crowded pseudobulbs and tufted roots. Pseudobulbs 4-6 cm long, oblong-conical, tetragonous, with large deciduous sheathing scales. Leaves 1-2 from the apex of pseudobulb, 14-25 x 3.2-5.5 cm, elliptic-oblong, base attenuate, apex acute or obtuse, coriaceous, strongly 3-nerved. Racemes drooping, axillary, 20-27 cm long. Flowers pinkish-white, hidden by imbricating, bifarious foliaceous persistent bracts; bracts to 6 x 5 mm, ovate-obtuse. Sepals subequal, to 7 x 5 mm, ovate, apex obtuse or acute, 3-nerved. Petals to 6 x 2.5 mm, linear-oblong. Lip to 8 x 8 mm, deeply saccate, sac longitudinally 3-ridged within, 3-lobed, mid-lobe bifid. Column orbicular-ovate, winged. Anthers 2-loculed, pollinia 4. Capsule ellipsoid, pendulous.

Narikkadavu, KJD 26276

Fl. & Fr.: September-March

Distribution: Fairly common in Semi-evergreen and Moist deciduous forests of Valayamchal to Narikkadavu.

PORPAX Lindl., Bot. Reg. 31: Misc. 66. 1845.

Porpax jerdoniana (Wight) Rolfe, Orch. Rev. 16: 18. 1908; Gamble, Fl. Pres. Madras 1422(995). 1928; Abraham & Vatsala, Introd. Orchids 387. 1981; Sathish & Manilal, Orchid Memories 214. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 844. 2009. *Lichenora jerdoniana* Wight, Ic. t. 1748. 1851. *Eria lichenora* Lindl., Proc. J. Linn. Soc. Bot. 3: 46. 1859; Hook. f., Fl. Brit. India 5: 787. 1890.

Small, epiphytic herbs; pseudobulbs 5-6 mm across, flat, discoid, covered by rigid net-like sheaths. Leaves 2, orbicular or ovate, yellowish-brown or green, tomentose on both sides, to 2 cm across, prominently veined. Flowers 1 or 2, between the leaves, pale-brown, subsessile, terminal or lateral, 8 mm long. Calyx connate, tubular, up to 5 mm long. Petals free, included within the calyx tube. Lip with a short erect teeth at apex, 3-lobed, fleshy, articulated with the column foot. Pollinia 8, connate in two groups. Capsule 3 x 2 mm, trigonous or ovoid, tomentose, 1 or 2 from the pseudobulbs between leaves; stalk to 2 mm long.

Crossway, KJD 26290

Fl. & Fr.: July-August

Distribution: Rare in Evergreen forests of Crossway and Narikkadavu.
Endemic to Western Ghats.

PTEROCERAS Hasselt ex Hassk., Flora Jens 25 (2) Biebl.; 6.1842.

Pteroceras leopardinum (Parish & Rchb.f.) Seidenf. & Smitin., Orch. Thail. IV: 535 f.395. 1963; Sathish., Rheedia 3: 173. 1993; Sathish & Manilal, Orchid Memories 215. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 845. 2009. *Thrixspermum leopardinum* Parish & Rchb.f., Trans. Linn. Soc. London 30:145. 1874. *Sarcochilus leopardinum* (Parish & Rchb.f.) Hook.f., Fl. Brit. India 6: 38. 1890. *Proteroceras holttumii* Joseph & Vajr., J. Indian Bot. Soc. 53: 189. 1974.

Epiphytic herbs, stem more or less curved, often weakly branched. Leaves 2-5, dorsoventral, 4-14.5 x 1-2 cm, linear-lanceolate to broadly oblanceolate, sometimes slightly oblique or somewhat falcate; apex minutely bilobed, lobes obtuse to acute. Inflorescence single or 2 superposed, straight to somewhat curved, erect to horizontal, 1.0-4.9 cm long; peduncle 0.7-3.0 cm long, glabrous, basally with 0-2 bract-like leaves; bracts 1.0-3.3 x 1.7-4.2 mm, scale-like, broadly ovate to reniform, concave, apex rounded to obtuse. Flowers 3-12. Sepals and petals spreading, glabrous, light orange-yellow to white with small brownish to violet dots on their adaxial side. Lateral sepals adnate to column foot for almost its whole length, 4.3-6.2 x 3.2-4.4 mm, broadly ovate, oblique, sometimes slightly concave; median sepal 4.4-6 x 2.3-3, ovate(-elliptic), often slightly concave. Petals 2.8-6.0 x 1.2-2.0 mm, oblong to linear-oblanceolate, apex rounded to obtuse. Lip 4.0-4.6 mm long, subsessile, surface smooth; side lobes erect, pointing upwards or backwards, white, usually with purplish-brown nectar guides on their adaxial side, oblong to linear, apex rounded; mid lobe represented by a transverse, ridge-like callus just above the spur, white, usually dotted purplish-brown; 2 small bulb-like calli present between the bases of side lobes and mid lobe; spur nearly cylindrical, 1.6-2.9 mm in diameter, inside more or less hairy, white; apex rounded. Column subterete, 1.7-2.5 mm high, yellowish to white, usually streaked with red, surface smooth. Rostellum much shorter than diameter of column; anther yellow; pollinia 4, closely appressed in two pairs. Ovary 3-keeled, glabrous, 3.0-9.0 x 0.6-1.6 mm. Capsule strongly 3-keeled, 1.7-4.8 cm x 4.0-10.0 mm.

Kariyenkappu, KVB 31594

Fl. & Fr.: April-June

Distribution: Rare in Evergreen forests of Kariyenkappu.

SEIDENFADENIELLA Sathish Kumar, Sathish Cat. India Orch. 47. 1994.

***Seidenfadeniella**

Pendulous epiphytes, to 15 cm long, stem terete, green. Leaves terete, linear, acute. Flowers rosy-white, in 5-6 cm long, erect, axillary racemes; dorsal sepal oblong, acute, lateral sepals falcately oblanceolate, 1-veined; petals orbicular or broadly elliptic-oblong, rounded, 3-veined; lateral lobes rounded, orbicular; midlobe ovate, acute; spur rounded at base, slender; column short and broad; foot 0; pollinia 2, entire.

Pothurumi, NS & KJD 25545

Fl. & Fr.: December-January

Distribution: Rare in Evergreen forests of Ambalappara-Pothurumi region. This species is closely allied to *S. filiformis* but differs by its flower size, colour, arrangement.

SATYRIUM Swartz, Kongl. Vetensk. Acad. Nya Handl. 21: 214. 1800, *nom. cons.*

Satyrium nepalense D. Don, Prodr. Fl. Nepal. 26: 1825; Gamble, Fl. Pres. Madras 1476(1032). 1928; Abraham & Vatsala, Introd. Orchids 210. 1981; Sathish & Manilal, Orchid Memories 218. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 846. 2009. *Satyrium neilgherrensis* Wight ex Fyson, Fl. Ind. Hill. This 1876. 1932.

Terrestrial herbs, to 30 cm tall, with oblong tuber. Leaves 2 or 3, 5.5-14 x 3-6 cm, ovate or elliptic-lanceolate, acute or subacuminate. Flowers pink or white, in 10-35 cm long, dense terminal raceme. Dorsal sepal oblong-lanceolate, 3-veined; lateral sepals elliptic, obtuse, 5-veined. Petals oblong, obtuse, 3-veined. Lip, 21 x 6 mm, superior, concave, keeled, enclosing the column with two parallel spurs. Column erect; foot 0. Pollinia 2, with recurved caudicle.

Ambalappara, *KJD 26316*

Fl. & Fr.: July-September

Distribution: Fairly common in Grasslands of Ambalappara.

SEIDENFIA Szlach., Syst. Orch., Fragm. Florist. Geobot. Suppl. 3:67.1995.

Seidenfia rheedei (Sw.) Szlach., Syst. Orch. 3: 122. 1995; Sathish & Manilal, Orchid Memories 221. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 849. 2009. *Malaxis rheedei* Sw., Kongl. Vetensk. Acad. Nya Handl. 21: 235. 1800; Manilal & Sivar., Fl. Calicut 283. 1982; Ansari, Fl. Kasaragod Div. 371. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 457. 1988. *Microstylis rheedei* (Sw.) Lindl., Gen. Sp. Orchid. Pl. 21. 1830p.p.; Hook. f., Fl. Brit. India 5: 690. 1890.

Terrestrial herbs; stem swollen towards base, to 15 cm long. Leaves broadly ovate or elliptic, to 12 x 6cm, with purple shades. Scape to 18 cm long; bracts subulate, deflexed. Flowers orange yellow, 0.5 cm across. Sepals and petals linear, 3 mm long. Lip reniform, margin pectinate.

Kariyenkappu, *KJD 31469*

Fl. & Fr.: July-September

Distribution: Rare in Evergreen forests of Kariyenkappu.

SIRHOOKERA O. Ktze., Rev. Gen. Pl. 2: 681. 1891.

Sirhookera latifolia (Wight) O. Ktze., Rev. Gen. Pl. 2: 681. 1891; Sathish & Manilal, Orchid Memories 222. 2004; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 850. 2009. *Josephia latifolia* Wight, Ic. t. 1743. 1851; Hook. f., Fl. Brit. India 5: 823. 1890; Gamble, Fl. Pres. Madras 1428(999). 1928.

Epiphytes with very short stem and vermiform roots. Leaves 9-10 x 2-2.5 cm, including a petiole of 1-1.5 cm long, oblong, acute. Flowers white, in 15-20 cm long branched racemes; branches slender. Dorsal sepal obovate, obtuse, 3-veined; lateral sepals elliptic-oblong, obtuse, 3-veined. Petals oblong, obtuse, 1-veined. Lip 4 x 2 mm, 3-lobed; lateral lobes smaller, oblong, obtuse, incurved; midlobe ovate, obtuse or acute.

Ambalappara, *KVB 31580*

Fl. & Fr.: August-December

Distribution: Common on rocks in Evergreen forests of Ambalappara.

TAENIOPHYLLUM Blume, Bijdr. 6: t. 3, f. 70. 1825.

Taeniophyllum scaberulum Hook. f., Fl. Brit. India 6: 77. 1890; Gamble, Fl. Pres. Madras 1448(1013). 1928; Rajesh et al., Rheedeia 7:43.1997; Sathish & Manilal, Orchid Memories 224. 2004.

Leafless epiphytic herbs, roots subterete, 5-8 x 0.1 cm. Flowers creamy white, 4 x 2 mm, in 1.5-2 cm long, flexuous spikes; bracts 0.9 x 1 mm, ovate, acute, persistent. Sepals and petals united into a 6 toothed tube; lobes ovate, acute; lip ovate, acute, tip recurved, base saccate.

Chavachi, *KJD 22527*

Fl. & Fr.: February-June

Distribution: Rare in Evergreen forests of Chavachi. Endemic to southern Western Ghats; Conservation status: Endangered.

ZEUXINE Lindl., Collect. Bot. Append. n. 18. 1825.

1a. Flowers large, 2 x 1 cm long *Z. affinis*

1b. Flowers small, 1 cm long *Z. clandestina*

Zeuxine affinis (Lindl.) Benth. ex Hook. f., Fl. Brit. India 6: 108. 1890; Sasidh. et al., Rheedeia 9: 159. 1999; Sathish & Manilal, Orchid Memories 231. 2004. *Monochilus affinis* Lindl., Gen. Sp. Orchid. Pl. 487. 1840, p.p.

Terrestrial herbs, 20-30 cm tall, with a creeping rhizome, 10-15 cm long. Leaves 3-4.5 x 1-1.5 cm, ovate or elliptic, acute, with sheathing base. Flowers white, 2 x 1 cm, in about 15-25 cm long lax raceme including 10-18 cm long, hairy peduncle; bracts 6 x 1.5 mm, ovate, acuminate, pubescent outer. Dorsal sepals and petals connated, sepals hairy dorsally; Dorsal sepal, 6 x 5 mm, ovate obtuse; lateral sepals 6 x 5mm, elliptic, obtuse. Petals 6-6.5 x 2.5 mm, falcate, oblong, obtuse. Lip 11 x 10 mm, saccate at base, with two cylindrical acute glands; epichile, 2 lobulate, lobules each 7 x 3.5-4 mm, obconical, truncate, wavy along margins. Column 5 x 2.5 mm; anther dorsal.

Ambalappara, *KJD 26339, KVB 31579*; Crossway, *NS & KJD 31915*

Fl. & Fr.: December-April

Distribution: Fairly common in Evergreen forests of Ambalappara, Asthipara, Chavachi, Kattikkari and Crossway.

Zeuxine clandestina Blume, Coll. Orch. Arch. Ind. 70. t.39. 1858; Rao, Indian For. 114: 95. 1988; Sasidh., Fl. Periyar Tiger Reserve 444. 1998.

Terrestrial herbs; stem to 30 cm high. Leaves elliptic, acute. Flowers whitish, 10 x 2 mm; bracts 6 x 1.9 mm, lanceolate, acuminate, margins erose, 1-veined. Sepal similar, 3.5 x 2 mm, ovate, obtuse, 1-veined; lateral sepals 3.5 x 2 mm, ovate, obtuse, 1-veined. Petals 3.5 x 1 mm, falcate, linear, obtuse, 1-veined. Lip 5 x 4.2 mm; midlobe squarish, 2.5 x 2 mm; sac with two backwardly curved gland.

Asthipara, *KJD 26087*

Fl. & Fr.: February-April

Distribution: Rare in Evergreen forests of Asthipara.

ZINGIBERACEAE

1a. Ovary 1-celled; placentation parietal..... Globba

1b. Ovary 3-celled; placentation axile 2

- 2a. Anthers spurred at base(except *C. ecalcarata*), bracts curved out Curcuma
- 2b. Anthers not spurred at base; bracts not as above 3
- 3a. Inflorescence lateral, usually arising directly from rhizome 4
- 3b. Inflorescence terminal on leafy stem 6
- 4a. Flowers in lax trailing panicle *Elettaria*
- 4b. Flowers in dense strobilioid spike 5
- 5a. Anthers diverging towards the apex; connective broad, crest-like *Amomum*
- 5b. Anthers parallel, connective produced into a long tail at apex *Zingiber*
- 6a. Inflorescence a panicle or raceme *Alpinia*
- 6b. Inflorescence strobilioid spike 7
- 7a. Spike 1-sided; sheath saccate *Boesenbergia*
- 7b. Spike radiates; sheath otherwise *Hedychium*

ALPINIA Roxb., *Asiat. Res.* 11: 350. 1810, *nom. cons.*

Alpinia galanga (L.) Sw., *Obs. Bot.* 2. 1791; Hook. f., *Fl. Brit. India* 6: 253. 1892; Gamble, *Fl. Pres. Madras* 1492(1042). 1928; Mangaly & Sabu, *Rheedea* 2: 43. 1992; Sabu, *Zingiberaceae and Costaceae of South India* 57. 2006. *Maranta galanga* L., *Sp. Pl.* 3. 1762. *Alpinia rheedei* Wight, *Ic. t.* 2026. 1853.

Aromatic perennial herb; root stock cylindric. Leafy stem to 2 m high, many. Leaves 40-65 x 8-13 cm, oblong-lanceolate, apex acute, base cuneate; petiole c. 5 mm long; ligule 6-7 mm long. Inflorescence terminal on the leaf shoot, dense-flowered; peduncle densely pubescent. Flowers c. 4 cm long, shortly pedicellate; bracts 2-2.5 x 0.5-0.8 cm, membranous; bracteoles c. 1.5 cm long. Calyx c. 1 cm long, cylindrical, split on one side, greenish-white. Corolla tube c. 1.2 cm long, greenish-white; lobes unequal, spreading, pubescent. Labellum c. 2 cm long, white, with a few oblique, lilac lines on either side of the midrib on the upper surface, base clawed, margins wavy, apex emarginate. Lateral staminodes 4-5 mm long, subulate. Anther 6-8 mm long; filament 1.2-1.5 cm long. Epigynous glands 2. Ovary 3 mm long, ellipsoid. Fruit 1 cm across, globose, orange-red.

Kariyenkappu, *KJD 26062*

Fl. & Fr.: February-December

Distribution: In the old settlements of Kariyenkappu.

AMOMUM Roxb., *Fl. Ind.* 1: 317. 1820, *nom. cons.*

- 1a. Rootstock running; flowers on creeping runners *A. hypoleucum*
- 1b. Rootstock not running; flowers produced on rhizomes 2
- 2a. Capsule ribbed *A. pterocarpum*
- 2b. Capsule echinate 3
- 3a. Lateral lobes of lip as large as middle lobe *A. muricatum*
- 3b. Lateral lobes of lip very short *A. cannicarpum*

Amomum cannicarpum (Wight) Benth. ex Baker in Hook.f., *Fl. Brit. India* 240. 1892; Gamble, *Fl. Pres. Madras* 1487(1039). 1928; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 466. 1988; Sabu, *Zingiberaceae and Costaceae of South India* 81. 2006; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 859. 2009. *Elettaria cannicarpa* Wight, *Ic. t.* 2007. 1853.

Herbs, leafy stem 2-3 m high, erect, straight, loosely clumped; rootstock horizontal, much branched, reddish outside, light pink inside. Leaves 50 x 8 cm, oblong-lanceolate, acuminate, glabrous, nearly sessile, lower leaves smaller; ligule 1 cm long, orbicular, reddish. Spike 1-few, to 16 cm long, obovoid; peduncles covered with imbricating bracts; basal empty bracts 3.5 cm long, ovate, obtuse, formed into sheath at base, reddish brown; bracteoles 2 cm long, tubular. Flowers one or two in a bract. Calyx lobes obtuse. Corolla lobes equal, 2 x 1 cm, obtuse,

glabrous. Style slender; stigma sub-globose; hairy Capsule 1.5 cm across, dark brown.

Way to Meenmutty, *KJD 26177*

Fl. & Fr.: March-June

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Crossway, Meenmutty, Moonamthode, etc. Endemic to Western Ghats.

Amomum hypoleucum Thw., Enum. Pl. Zeyl. 318. 1861; Hook. f., Fl. Brit. India 6: 240. 1892; Gamble, Fl. Pres. Madras 1487(1039). 1928; Sabu, Zingiberaceae and Costaceae of South India 84. 2006.

HerbS, rhizomes perennial, slender. Leafy shoots 2-3 50-100 cm tall. Leaves 30-45 x 5-10 cm, acuminate, silky pubescent below; petiolate, ligule short, 2-4 mm long, bilobed, glabrous. Spikes 2 or 3 flowered; bracts membranous, glabrous; bracteoles longer than bracts, tubular, glabrous. Calyx 3-lobed, glabrous. Corolla white, equal or slightly longer than calyx, lobes equal, glabrous. Labellum yellow with pink lines, hairy near throat. Lateral staminodes reduced to two small, teeth like projections. Anther 9 mm long, connective prolonged in to truncate crest. Ovary 5 mm long.

Kariyenkappu, *KJD 31485*

Fl. & Fr.: June-October

Distribution: Common in Plantations of Kariyenkappu; Semi-evergreen forests of Pothamplavu, Narikkadavu; Evergreen forests of Meenmutty and Moist Deciduous Forests at Paripode.

Amomum muricatum Bedd., Madras J. Lit. Sci. ser. 3, 1: 59. 1864; Gamble, Fl. Pres. Madras 1487(1039). 1928; Ansari, Fl. Kasaragod Div. 376. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 466. 1988; Zingiberaceae and Costaceae of South India 88. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 860. 2009.

Herbs; leafy stem 1.5-3 m high, densely clumped, erect, straight. Leaves 30 x 7 cm, elliptic-oblong, acuminate, sessile, glabrous; ligule 3 mm long, truncate. Spikes 2-5-together, 14-15 cm long, shortly peduncled; floral bracts 3.5 x 1.5 cm, obovate, obtuse, ciliate; yellow with brown lines; bracteoles 2 cm long, lobes obtuse. Flowers densely packed. Calyx tube 2.5 cm long, lobes obtuse, cuspidate. Corolla tube 2.8 cm long, lobes unequal, to 3 x 1.8 cm, oblong, obtuse, yellow with red lines. Labellum 4 x 3 cm; middle lobes emarginate, yellow, with brown streaks. Anthers 9 mm long, crest, 15 mm broad, auriculate. Capsule 1.5-2 cm across, brown.

Kattikkari, *KJD 26075*

Fl. & Fr.: February-July

Distribution: Common in the Plantations of Kariyenkappu; Evergreen forests of Chelachode, Chavachi, Kattikkari and Mullenpara. Endemic to southern Western Ghats.

Amomum pterocarpum Thw., Enum. Pl. Zeyl. 317. 1861; Hook. f., Fl. Brit. India 6: 241. 1892; Sabu, Zingiberaceae and Costaceae of South India 89. 2006. *Amomum microstephanum* Baker in Hook.f., Fl. Brit. India 6: 239. 1892; Gamble, Fl. Pres. Madras 1487(1039). 1928.

Herbs, stem to 2 m high, clumped, erect; rhizome to 4 cm thick, old ones bluish inside. Leaves to 50 x 12 cm, elliptic-oblong, acute at either ends, glabrous, usually clustered towards the apex; petiole to 3 cm long; ligule 3 mm long, whitish. Spikes 5-15 cm long, 3-4 together; bracts 6-7 x 4 cm, broadly elliptic, obtuse, pale pink. Flowers solitary in a bract. Labellum 4 x 3 cm,

obovate, white with yellow centre. Capsule 3 cm long, glabrous; wings 3-8 mm broad, entire.

Kariyenkappu, *KJD 26116; 55 Block, KJD 25420*

Fl. & Fr.: May-October

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Chavachi and Moist Deciduous Forests of Pothanplavu, Paripode, etc.

BOESENBERGIA O. Ktze., Rev. Gen. Pl. 2: 685. 1891.

Boesenbergia pulcherrima (Wall.) O. Ktze., Rev. Gen. Pl. 2: 685. 1891; Mangaly & Swarup., Bull. Bot. Surv. India 23: 235. 1981; Ansari, Fl. Kasaragod Div. 377. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 467. 1988; Sabu, Zingiberaceae and Costaceae of South India 121. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 860. 2009. *Gastrochilus pulcherrimus* Wall., Pl. Asiat. Rar. 1: 22,t.24. 1829; Hook. f., Fl. Brit. India 6: 217. 1890.

Suberect herbs, 15-25 cm high. Leaves few, scattered, to 13 x 6 cm, broadly elliptic, acute at both ends, thinly tomentose beneath; petiole to 2 cm long; sheath saccate. Spikes to 5 cm long, terminal, one sided; bracts 20 x 8 mm, obovate, obtuse; bracteoles tubular, deeply cleft to the base. Flowers solitary in each bracts. Calyx tube short, truncate. Corolla tube 15 mm long; lobes equal, 10 x 4 mm, oblong. Labellum 20 x 15 mm, obovate, acute, white with brown spots. Lateral staminodes 10 x 5 mm obovate. Filaments 2 mm long; anthers parallel, not crested. Ovary 3-celled, oblong; ovules few; style filiform. Fruit an oblong capsule.

Kattikkari, *KJD 31881*

Fl. & Fr.: June-October

Distribution: Common in the Plantations of Kariyenkappu; Evergreen forests of Crossway, Chelachode, Chavachi, Meenmutty, Kattikkari; Semi-evergreen forests of Paripode and Pothanplavu.

CURCUMA Roxb., Asiat. Res. 11: 329. 1810, *nom. cons.*

- 1a. Anthers spurred..... 2
1b. Anthers not spurred *C. ecalcarata*
2a. Lower surface sparsely pubescent, midrib not coloured..... *C. neilgherrensis*
2b. Lower surface glabrous, midrib red coloured..... *C. aeruginosa*

Curcuma aeruginosa Roxb., Asiat. Res. 11: 335. 1810; Hook. f., Fl. Brit. India 6:212.1890; Sabu, Zingiberaceae and Costaceae of South India 132. 2006. *Curcuma caesia* auct. non Roxb; Mangaly & Sabu, Rheedea 3: 147. 1993. *Curcuma malabarica* Velayu. et al., Journ. Econ. Tax. Bot. 14:189. 1990.

Rhizomatous herbs, leafy stem 70-100 cm high; sheaths green; rhizome, 5-6 x 9-10 cm, bluish; roots fleshy; root tubers many, ovate-oblong, creamy. Leaves distichous, 30-40 x 10-12 cm, oblong-lanceolate, tip acute, base acuminate, glabrous purple or reddish-brown patch along the sides of the distal half of the mid rib; petiole as long as lamina. Inflorescence lateral, 25-30 cm long, peduncle 12-18 cm; spike 12-15 x 5 cm; coma bracts, pink to violet; fertile bracts 18-20, 4.5-5 x 4.4-5 cm lower half fused, tip rounded, green with a pink tip, flowers 8-10 per bracts; bracteoles 3.5 x 2.5 cm, white with a median light green patch. Flowers 4.5-5 cm, equal to or slightly shorter than the bracts. Calyx 1 cm, truncate, 3-lobed at apex, split on one side. Corolla tube 3-3.3 cm long, pink, lobes unequal; dorsal lobes 1.5 x 1.2 cm, concave; lateral lobes 1.5 x 1 cm, tip rounded, pink. Labellum 1.5-1.7 x 1.8 cm tip emarginated, yellow with a deep yellow median band. Lateral staminodes 1.5 x

1 cm, yellow. Anther 7 mm, without crest, spurred at base, spurs 3mm long, divergent. Epigynous glands two, 5 mm long, linear, yellowish green. Ovary 5 mm, long; style filiform; stigma bi-lipped, slightly exerted above the anther lobes.

Kariyenkappu, *KJD 26171*

Fl. & Fr.: April-May

Distribution: Occasional in Plantations of Kariyenkappu.

Curcuma ecalcarata Sivar. & Indu, Notes Roy. Bot. Gard. Edinb. 41: 321. 1983; Mangaly & Sabu, Rheedia 3:151. 1993; Sabu, Zingiberaceae and Costaceae of South India 150. 2006.

Herbs, rhizome small, 3-5 x 2-2.5 cm, conical, yellow inside; roots many, fleshy; roots tubers fusiform, white inside. Leafy stems 30-45 cm high. Leaves bifarious, 20-30 x 10-15 cm, broadly ovate, acuminate, slightly and often unequally cordate at base; pubescent below near the midrib towards the base, profusely lepidote on the lower surface, sparsely lepidote on the upper surface; petiole 20-25 cm, minutely pubescent. Inflorescens central; peduncle 12-15 cm long, pubescent; spike 10-15 cm long, pubescent, with a distinct coma; coma bracts longer than the fertile ones, 4 x 3.5 cm, free or slightly adnate at base, bright rose in those with fertile bracts and greenish-white in those with fertile bracts; fertile bracts ca 3 x 2.5 cm, broadly rounded, tip recurved, green or rose; bracteoles ca 7 mm long, triangular with a longitudinal ridge at the back. Flowers 5-6 cm long. Calyx 1-1.3 cm long, truncate, 3-lobed at apex, deeply split on one side, pubescent. Corolla tube 2.5-3 cm long, lobes unequal; dorsal lobe 1.5 x 1 cm, oblong, concave, hooded and apiculate at tip; laterals 1.5 x 0.7 cm, oblong-obtuse, light yellow-orange. Labellum 2-2.2 x 2-2.2 cm, 3-lobed, lateral lobes rounded, middle lobe triangular, much exceeding the laterals, yellow or orange-yellow; lateral staminodes 1.8-2 x 0.8 cm, oblong-obtuse. Stamens yellow; filament broad; anther 4-5 mm long, thecae parallel, ecalcarate, connective broad, hooded at apex, glandular hairs on the back. Epigynous glands two, 4 mm long, cylindrical. Ovary 1.2 x 1 mm, pubescent, style long, filiform; stigma cup-like, hairy. Fruit 1.5 x 1 cm, obovoid, slightly trigonal, pubescent; seeds many 6 x 3 mm, obovoid; aril lacerate, lobes 6-8, narrow, white.

Way to Meenmutty, *KJD 26179*

Fl. & Fr.: June-November

Distribution: Common in Moist Deciduous Forests of Paripode, Nraikkadvu, Pookundu, Pothamplavu-Meenmutty area etc. Endemic to Western Ghats.

Curcuma neilgherrensis Wight, Ic. t. 2006. 1853; Hook. f., Fl. Brit. India 6: 210. 1892; Gamble, Fl. Pres. Madras 1482(1036). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 468. 1988; Sabu, Zingiberaceae and Costaceae of South India 169. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 862. 2009. *Curcuma angustifolia* sensu Dalz. & Gibs., Bombay Fl. 274. 1861, non Roxb.

Rhizomatous small herbs; rhizome small, conical. Leafy shoots 20-30 cm high. Leaves 12-15 x 6-9 cm, lower surface sparsely pubescent, ligule small; petiole 10-15 cm green. Inflorescence lateral, with distinct coma. Coma bracts 6-7, pink or violet; fertile bracts 6-15, margin wavy, densely pubescent; bracteoles triangular. Flowers longer than bracts, light yellow. Calyx 3-lobbed, densely pubescent. Corolla light yellow, lobes unequal, pubescent, dorsal lobe hooded. Labellum with a median cleft. Staminode yellow. Anthers spurred,

downwardly pointed. Ovary trilocular, ovules many, style long filliform; stigma bilipped.

Ambalappara, *KJD 26143; NS & KVB 31412*

Fl. & Fr.: April-October

Distribution: Fairly common in Grasslands of Ambalappara. Endemic to Western Ghats.

ELETTARIA Maton, Trans. Linn. Soc. London 10(2): 250. 1811.

Elettaria cardamomum (L.) Maton, Trans. Linn. Soc. London 10: 254. 1811; Hook. f., Fl. Brit. India 6: 251. 1892; Gamble, Fl. Pres. Madras 1491(1041). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 471.1988; Sabu, Zingiberaceae and Costaceae of South India 101. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 867. 2009. *Amomum cardamomum* L., Sp. Pl. 1: 1. 1753. *Alpinia cardamomum* (L.) Roxb., Asiat. Res. 11:356. 1810 & Pl. Corom. 3: 19. t. 226. 1819. *Elettaria cardamomum* (L.) Maton var. *minus* Watt, Econ. Prodr. India 512. 1908. *Elettaria cardamomum* (L.) Maton var. *minuscula* Burkill, Bull. Misc. Inform. Kew 1930:35.1930.

Herbs, rhizome branched, thick; leafy shoots to 2 m high, tufted. Leaves bifarious, to 60 x 10 cm, elliptic-lanceolate, acute at both ends. Flowers in prostrate or erect, 30-50 cm long, panicles from the rhizome; bracts scarius, 3-4 cm long, supporting 2-7 flowers. Calyx tubular, 1 cm long, split on one side. Corolla white, tube equal to the calyx, lobes unequal, to 2 cm long, oblong. Labellum 1 x 0.5 cm, obovate, white with red lines. Stamen 1, filaments short; anther cells parallel, shortly spurred; staminodes short. Ovary 3-celled, ovules many, style filiform, stigma funnel shaped. Capsule 8-13 x 5-8 mm, ellipsoid, striate; seeds many, angular, fragrant.

Kattikkari, *KJD 26366*

Fl. & Fr.: September-February

Distribution: Fairly common in Evergreen forests of Kattikkari, Mullenpara and Chavachi.

GLOBBA L.

Globba sessiliflora Sim., Bot. Mag. 35: t. 1428. 1811. *Globba careyana* Roxb., Fl. Ind. 1: 80. 1820. *Globba ophioglossa* Wight, Ic. 6: 16. t. 2002. 1853; Hook. f., Fl. Brit. India 6: 202. 1890; Gamble, Fl. Pres. Madras 1480(1035). 1928; Ansari, Fl. Kasaragod Div. 379. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 469. 1988; Sabu, Zingiberaceae and Costaceae of South India 109. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 864. 2009.

Rhizomatous herbs; rhizome small, 3 x 0.2 cm, conical, light yellow-grey inside; roots many, thick and fleshy, root tubers elongated. Leafy shoots 30-90 cm high, lower vegetative bracts green to reddish-green, sparsely pubescent. Leaves 5-20 x 2-5 cm, oblong-lanceolate, tip acuminate, lower surface densely pubescent, upper surface sparsely pubescent; shortly petiolate or sessile; ligule 2-3 mm long, membranous, bipartite, densely pubescent. Inflorescence terminal, 10-20 cm long, erect, bearing few to many slender branches in the axils of bracts, lower bracts with small, downwardly pointed conical bulbils; bracts small, 5 x 2 mm, ovate, prominently 3-nerved, glabrous, greenish-yellow, each fertile bracts subtends a cincinnus of 2 many flowers on a 4 mm stalk; bracteoles small, 3 x 2 mm, triangular, orange. Flowers 3.5-4 cm long. Calyx truncate, 8 mm long, shortly 3-lobed, lobes equal, glabrous. Corolla tube 1.8-2 cm long, orange, densely pubescent; lobes unequal, spreading;

dorsal lobe c. 6 x 3 mm, cup-shaped with an apical hood, orange-yellow, lower middle portion minutely pubescent; lateral lobes c. 5 x 3 mm, ovate, orange-yellow, glabrous. Labellum much longer than the corolla lobes, 12 x 4 mm, linear, tip emarginate, orange-yellow, glabrous. Lateral staminodes c. 16 x 3 mm, linear, tip acuminate, orange, outer surface pubescent. Staminal filament 2 cm long, slender; anther small, c. 4 mm, thecae parallel, without appendages, connective slightly projecting to form a hood at the tip. Style long, exerted from the anther lobes, mouth of the stigma hairy. Ovary 2 x 1 mm, smooth, unilocular with many ovules on three parietal placentae. Fruit 2 x 1.5 cm, globose to ovoid, slightly warted, dehiscent; seeds ovoid, hairy throughout, with a basal, lacerate aril.

Chelachode, *KJD 31812*

Fl. & Fr.: July-October

Distribution: Common in Evergreen forests of Chelachode, Chavachi, Moonamthode, Meenmutty; Moist Deciduous Forests of Narikkadavu, Paripode, Pottichapara, Pothanplavu and Plantations of Kariyenkappu.

HEDYCHIUM Koenig, in Retzius, *Observ. Bot.* 3: 61. 1783.

Hedychium coronarium Koenig in Retz., *Obs. Bot.* 3: 73. 1783; Hook. f., *Fl. Brit. India* 6: 225. 1892; Gamble, *Fl. Pres. Madras* 1485(1039). 1928; Sabu, *Zingiberaceae and Costaceae of South India* 196. 2006; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 867. 2009.

Herbs, leafy stem to 1.5 m high, robust, densely clumped; rhizome horizontal. Leaves to 30 x 10 cm, oblong, acuminate, glabrate; ligule 2 cm long, acuminate. Spike 15 x 7 cm, ovoid; bracts 5 x 2 cm, oblong, obtuse, glabrous. Flowers 2-4 in each bracts. Calyx 4 cm long, not split, glabrous. Corolla tube 9 cm long, narrow, glabrous, lobes 3.5 cm long, slender, glabrous. Lip 6 x 6 cm; lobes emarginate, white; anthers 1.5 cm long, filaments shorter than lip.

Kariyenkappu, *KJD 26159*

Fl. & Fr.: October-December

Distribution: In the old settlements.

ZINGIBER Bohmer, *Apud Ludwig Def. Gen. Pl.* 89. 1760, *nom. cons.*

- 1a. Inflorescence peduncled..... 2
- 1b. Inflorescence not peduncled..... *Z. wightianum*
- 2a. Flowers produced on globose head of the spike *Z. zerumbet*
- 2b. Flowers produced on elongated spike..... *Z. neesatum*

Zingiber neesatum (Graham) Ramam. in Saldanha & Nicolson, *Fl. Hassan Dist.* 769. 1976; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 470. 1988; Sabu, *Zingiberaceae and Costaceae of South India* 235. 2006; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 866. 2009. *Alpinia neesiana* Graham, *Cat Pl. Bombay* 2-7. 1839. *Zingiber macrostachyum* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 4: 342. 1852; Hook. f., *Fl. Brit. India* 6: 247. 1892; Gamble, *Fl. Pres. Madras* 1490(1041). 1928.

Annual or perennial herbs; leafy stem 40-70 cm high, solitary or 2-4 together, erect. Leaves 25-35 x 3.5 cm, elliptic-oblong, acute at base, sessile; ligule 8 mm long, ovate. Spikes to 25 cm long, enlarging in fruit, terete on erect peduncle of 30-35 cm long; floral bracts 3 x 1.4 cm, obtuse, reddish. Flowers solitary in each bract. Calyx 2 cm long, glabrous. Corolla tube 2 cm long, lobes unequal, larger lobe 3.5 x 1.5 cm, elliptic, acute, glabrous.

Labellum 3.5 x 3.5 cm, 3-lobed; lobes obtuse, glabrous, middle lobe emarginated. Ovary glabrous. Capsule 3-4 cm long, ellipsoid, smooth, red inside, 3-valved.

Pothurumi, *KJD 25461*

Fl. & Fr.: July-September

Distribution: Rare at Evergreen forests of Ambalaappara. Endemic to Western Ghats.

Zingiber wightianum Thw., Enum. Pl. Zeyl. 315. 1861; Hook. f., Fl. Brit. India 6: 244. 1892; Gamble, Fl. Pres. Madras 1489(1040). 1928; Manilal & Sivar., Fl. Calicut 287. 1982; Sabu, Zingiberaceae and Costaceae of South India 245. 2006. *Zingiber squarrosus* Wight, Ic. t. 2004. 1853, non Roxb. 1832.

Herbs, rhizomes thick, fleshy. Leafy shoot to 1.3 m high. Leaves 15-30 X 5-6 cm, lower surface pubescent, upper surface glabrous, almost sessile, ligule bifid, membranous. Inflorescence produced separately on leafless short stock, peduncle 4-8 cm long; bracts greenish red pubescent; bracteoles shorter than bracts. Calyx 3-toothed, unilaterally split, sparsely pubescent. Corolla tube yellowish, 2.5 cm long, pubescent, lobes almost equal. Labellum yellow-orange, prominently marked with purple streaks. Staminodes acute. Stamens shorter than lip, almost sessile. Ovary trilocular.

55 Block, *KJD 25421*

Fl. & Fr.: July-October

Distribution: Rare at Moist Deciduous Forests of Paripode.

Zingiber zerumbet (L.) J.E. Smith, Exot. Bot. 2: 105, t.112.1804; Hook. f., Fl. Brit. India 6:247. 1892; Gamble, Fl. Pres. Madras 1490(1040). 1928; Manilal & Sivar., Fl. Calicut 287. 1982; Ansari, Fl. Kasaragod Div. 380. 1985; Sabu, Zingiberaceae and Costaceae of South India 247. 2006. *Amomum zerumbet* L., Sp. Pl. 1. 1753.

Rhizomatous herbs; leafy stem to 1.2 m high. Leaves 15-35 x 4-7.5 cm, oblong or oblong-lanceolate, base obtuse, apex acuminate, pubescent below; ligule to 2.5 cm long. Peduncle 20-35 cm long; sheath to 6 cm long, oblong, apex rounded. Spikes 5-8 x 3.5-6 cm, ovoid or oblong; bracts 2-3.5 x 1.5-2 cm, broadly ovate, rounded, margin membranous, green, turning blood-red on maturity. Flowers white. Calyx tube 1-1.5 cm long, 3-lobed. Corolla to 2.5 cm long, dorsal lobe ovate-acuminate. Labellum c. 2 x 2 cm, 3-lobed, mid-lobe suborbicular, lateral lobes ovate, c. 1.2 cm long. Capsule 2-2.5 x c. 1 cm, oblong; seeds 2-3 mm across, globose.

55 Block, *KJD 25424*

Fl. & Fr.: July-November

Distribution: Rare in Moist deciduous Forests of Paripode.

COSTACEAE

COSTUS L., Sp. Pl. 2. 1753.

Costus speciosus (Koenig) J.E. Smith, Trans. Linn. Soc. London 1: 249. 1791; Hook. f., Fl. Brit. India 6: 249. 1892; Gamble, Fl. Pres. Madras 1490(1041). 1928; Manilal & Sivar., Fl. Calicut 288. 1982; Ansari, Fl. Kasaragod Div. 380. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 467. 1988; Sabu, Zingiberaceae and Costaceae of South India 259. 2006; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 860. 2009. *Banksea speciosa* Koenig in Retz., Obs. Bot. 3: 75. 1783.

Herbs, rhizome tuberous, 1-2 cm thick, highly branched, yellowish-green inside. Leafy shoots 1.5-2.5 m high. Leaves spirally arranged, 8-24 x 3-7 cm, oblong or oblanceolate-oblong, base tapering, apex abruptly acuminate, upper surface glabrous, lower surface sparsely hairy; ligule truncate, densely hairy; petiole 3-5 mm long. Spikes terminal, 4-9 x 2-5 cm, more or less globose; bracts 1.5-3 x 0.7-1.5 cm, ovate-acute, with a narrow subapical protruberance, reddish; bracteoles 1-1.5 cm long, oblong, reddish. Calyx 2-2.5 cm long, 3-lobed; lobes 3-5 mm long. Corolla white; lobes to 4 x 0.8 cm, elliptic-oblong, acuminate. Labellum 5-8 cm wide, suborbicular, white with a creamy-yellow median band. Stamen median, on an oblong petaloid process. Ovary 5-8 mm long, globose, 3-lobed, 3-celled; ovules many; stigma crescent-shaped, ciliate. Capsule bright red, 2.5-3 x 2-2.5 cm, dehiscent loculicidally; seeds 6-8 x 3-4 mm, black with fleshy white aril.

Kariyenkappu, *KJD 18726*

Fl. & Fr.: July-September

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Chavachi and Semi-evergreen forests of Paripode.

MARANTACEAE

- 1a. Inflorescence a large terminal panicle, large shrubs *Schumannianthus*
1b. Inflorescence a small spike from rhizome, herbs *Stachyphrynium*

SCHUMANNIANTHUS Gagnep., Bull. Soc. Bot. France 51: 176. 1904.

Schumannianthus virgatus (Roxb.) Rolfe, J. Bot. 14: 244. 1907; Gamble, Fl. Pres. Madras 1494(1043). 1928; Ansari, Fl. Kasaragod Div. 381. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 471. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 867. 2009. *Phrynium virgatum* Roxb., Asiatic Res. 11: 324. 1810. *Maranta virgata* (Roxb.) Wall. ex Wight, Ic. t. 2015. 1853. *Clinogyne virgata* (Roxb.) Benth. in Benth. & Hook. f., Gen. Pl. 3: 651. 1883; Hook. f., Fl. Brit. India 6: 258. 1892.

Erect herbs, to 4 m high; stem thickened at nodes. Leaves bifarious, to 40 x 18 cm, ovate-oblong, cuspidate at apex, rounded at base; petiole to 1 cm long; sheath to 20 cm long, open. Panicle to 50 cm long, branches slender, dichotomous; bracts 3-5 x 0.6 cm, lanceolate. Flowers paired in each bract. Sepals small. Corolla white, tube short; lobes oblong. Stamens 1, outer staminodes petaloid, white, to 1.5 cm long; inner staminodes smaller. Ovary densely hairy, 3-celled, solitary in each cell, basal. Berry obovoid, rugose.

Meenmutty, *KJD 31488*

Fl. & Fr.: June-April

Distribution: Fairly common in Evergreen forests of Moonamkappu, Kattikkari; Plantations of Kariyenkappu and Semi-evergreen forests of paripode, in moist localities.

STACHYPHRYNIUM K. Schumann., Pflanzenr. (Engler) Marant. 45. 1902.

Stachyphrynium spicatum (Roxb.) Schum. in Engl., Pflanzenreich Marant. 46. 1902; Gamble, Fl. Pres. Madras 1494(1044). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 471. 1988; Vajr. & Bhargavan, Journ. Econ. Tax. Bot. 3: 973. 1982. *Phrynium spicatum* Roxb., Fl. Ind. 1: 5. 1820.

Herbs, rhizome creeping, nodose. Leaves 2-5 together, lamina to 20 x 7 cm, ovate-oblong, abruptly acuminate at apex, rounded at base; nerves many; petiole to 30 cm long, sheathing at base. Spike 1 or 2, basal, 3-5 cm long,

sessile or shortly peduncled. Flowers 3-8, sessile; bracts 15 x 7 mm, ovate. Sepals 5 mm long, narrow. Corolla dull white, 2.5 cm long; lobes oblong. Stamen 1, petaloid; anthers adnate on the margin; staminodes obovate, clawed. Ovary 3-celled; ovule solitary in each cell. Capsule 8 x 6 mm, ovoid; seeds wrinkled.

Kariyenkappu, *KJD 31489*

Fl. & Fr.: March-May

Distribution: Common in Plantations of Kariyenkappu; Evergreen forests of Chavachi, Crossway and Semi-evergreen forests of Pothanplavu, Paripode, etc.

MUSACEAE

- 1a. Rhizome stoloniferous, pseudostem cylindrical *Musa*
1b. Rhizome not stoloniferous, pseudostem conical *Ensete*

ENSETE Bruce ex Horan., Prod. Monog. Scitam. 40. 1862.

Ensete superbum (Roxb.) Cheesman., Kew Bull. 1947: 100. 1948; Ansari, Fl. Kasaragod Div. 382. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 868. 2009. *Musa superba* Roxb., Pl. Corom. 3: 17. 1811; Hook. f., Fl. Brit. India 6: 261. 1892; Gamble, Fl. Pres. Madras 1497(1046). 1928.

Erect herbs with globose leaf sheaths formed into a pseudostem of 50-100 cm diam. Leaves spirally arranged, to 3 x 0.8 m, oblong, entire with channelled midrib; lateral nerves many, parallel from midrib. Spadix 50-100 cm long, with 3-5 spathes at base; bracts several, to 20 x 14 cm, ovate, obtuse, brown. Flowers many on each bracts; unisexual, female flowers towards the base and male flowers above. Sepals 5 and 2 petals united into a sheath, 3.5 cm long, 5-lobed; third petals forms into a membranous sheath. Stamens 5, perfect, anthers 2.5 cm long, linear-oblong, filaments free. Ovary 3-celled, inferior; ovules several in each cell; style simple, stigma globose. Fruit oblong; seeds few, subglobose, black.

Meenmutty, *KJD 18784*

Fl. & Fr.: Throughout the year

Distribution: Occasional in Evergreen forests of Meenmutty among rocks near streams.

MUSA L., Sp. Pl. 1043. 1753.

Musa acuminata Colla, Mem. Gen. Musa 25: 394. 1820; Mohanan & Sivad., Fl. Agasthyamala 714. 2002.

Large cormous herbs, stoloniferous; pseudostem 3.5 m high, 15-25 cm diam. Leaves 2-2.5 m long, 30-50 cm wide; petiole 30-50 cm long. Spikes drooping. Peduncle and rachis hairy; bracts completely covering the flowers, 15-20 x 4.5-5 cm, ovate-lanceolate. Flowers 15-16 per bract in 2 rows. Perianth united into 2 cymbiform spathes, outer longer. Stamens 5. Ovary inferior, 3-celled; ovules many. Fruit bright yellow on ripening, 8-12 cm long, 1.5-3 cm diam; seeds many, angled.

Kattikkari, *KJD 26256*

Fl. & Fr.: Throughout the year

Distribution: Rare in Evergreen forests of Kattikkari-Meenmutty area.

HAEMODORACEAE

- 1a. Leaves linear; anthers free, sagitate *Ophiopogon*
1b. Leaves elliptic, plicate; anthers united at base forming a ring *Peliosanthes*

OPHIOPOGON Ker-Gawl., Bot. Mag. t. 1063. 1807.

Ophiopogon intermedius D. Don, Prodr. Fl. Nepal. 48. 1825; Hook. f., Fl. Brit. India 6: 269. 1892; Gamble, Fl. Pres. Madras 1499(1048). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 472. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 868. 2009. *Ophiopogon indicus* Wight, Ic. t. 2050. 1853.

Perennial herbs, densely tufted, scapigerous; rootstock rhizomatous. Leaves clustered, 25-40 x 0.7 cm, linear-oblong, ribbed, narrowed to the base into a petiole. Scape to 35 cm long. Flowers 4-10 in raceme, pedicel 5 mm long. Tepals 6, white with pink shades, 6 x 4 mm, oblong, obtuse. Stamens 6, filaments free, shorter than tepals; anthers sagittate at base. Ovary 3-celled, cell 1-ovuled. Berry 7 mm across, globose, glabrous, blue; seeds 1-3, globose or trigonous.

Ambalappara, *KJD 26132*

Fl. & Fr.: July-December

Distribution: Fairly common in Evergreen forests of Ambalappara and Asthipara.

PELIOSANTHES Andr., Bot. Repos. 10: t. 605. 1808.

Peliosanthes teta Andr. **ssp. humilis** (Andr.) Jessop, Blumea 23: 155. 1976 & in Steenis, Fl. Males. I. 9: 299. 1979; Ansari, Fl. Kasaragod Div. 383. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 472. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 869. 2009. *Peliosanthes humilis* Andr., Bot. Repos. 10, t. 634. 1808. *Peliosanthes neilgherrensis* Wight, Ic. t. 2052. 1853; Hook. f., Fl. Brit. India 6: 266. 1892; Gamble, Fl. Pres. Madras 1498(1047). 1928. *Peliosanthes courtallensis* Wight, Ic. t. 2051. 1853; Hook. f., Fl. Brit. India 6: 266. 1892; Gamble, Fl. Pres. Madras 1498(1047). 1928.

Perennial herbs, scapigerous, stem solitary or loosely tufted. Leaves few, clustered, 25-32 x 5-10 cm, elliptic, acute at both ends, plicate; petiole to 30 cm long. Racemes to 20 cm long, many-flowered; bracts 1 cm long, lanceolate. Flowers purple, many, 6-8 mm across, 1-few in each bract. Tepals 6, oblong, connate at base. Stamens 6, filaments shorter than tepals, united at base into a ring. Berry 8 x 8 mm, top-shaped, glabrous, bluish black; seeds 1-3, globose.

Kattikkari, *KVB 31634*

Fl. & Fr.: March-August

Distribution: Fairly common in Evergreen forests of Kattikkari, Chavachi and Moonamthode.

HYPOXIDACEAE

- 1a. Leaves linear; fruit dehiscent circumscissile..... Hypoxis
1b. Leaves elliptic, fruits indehiscent..... Curculigo

CURCULIGO Gaertn., Fruct. 1: 63, t. 16, f. 11. 1788.

Curculigo orchoides Gaertn., Fruct. 1: 63. t. 16. f.11. 1788; Hook. f., Fl. Brit. India 6: 279. 1892; Gamble, Fl. Pres. Madras 1502(1050). 1928; Manilal & Sivar., Fl. Calicut 290. 1982; Ansari, Fl. Kasaragod Div. 388. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 473. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 876. 2009. *Curculigo malabarica* Wight, Ic. t. 2043A.1853.

Small herbs, rhizome to 15 cm long, oblong, perennial. Leaves 10-15 x 2 cm, lanceolate, plicate, base sheathing, pilose, subsessile. Perianth yellow, 1.5

cm across; tube 3 cm long, narrow, sparsely pilose. Stamens 6, filaments erect. Ovary 3-celled; ovules many, villous. Fruit baccate; seeds subglobose.

Ambalappara, *KJD 26141*

Fl. & Fr.: May-August

Distribution: Rare in Evergreen forests of Ambalappara.

HYPOXIS L., Syst. ed. 10. 986. 1759.

Hypoxis aurea Lour., Fl. Cochinch. 200. 1790; Hook. f., Fl. Brit. India 6: 277. 1892; Gamble, Fl. Pres. Madras 1501(1049).

. Small herbs, rhizome globose, 1 cm long, perennial, roots fleshy. Leaves 10-15 x 0.5 cm, linear, radical, sessile. Scapes 2 or 3, slender, to 10 cm long. Flowers 1 or 2. Perianth yellow, 1 cm long, pilose, lobes elliptic-lanceolate. Stamens 6. Ovary 3-celled, ovules many, stigma 3-lobed. Capsule 1 cm long, 3-veined, cylindrical-turbinate; seeds subglobose.

Ambalappara, *KVB 31701*

Fl. & Fr.: May-August

Distribution: Rare in Grasslands and Evergreen forests of Ambalappara.

DIOSCOREACEAE

DIOSCOREA L., Sp. Pl. 1032. 1753.

1a. Leaves digitate-pinnate..... *D. pentaphylla*

1b. Leaves simple..... *D. oppositifolia*

Dioscorea oppositifolia L., Sp. Pl. 1033. 1753; Hook. f., Fl. Brit. India 6: 292. 1892; Gamble, Fl. Pres. Madras 1512(1056). 1928; Ansari, Fl. Kasaragod Div. 386. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 474. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 872. 2009. *Dioscorea oppositifolia* L. var. *linnaei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 30. 1914; Gamble, Fl. Pres. Madras 1512(1056). 1928. *Dioscorea oppositifolia* L. var. *dukhunensis* Prain & Burkill, J. Asiat. Soc. Bengal 10: 30. 1914; Gamble, Fl. Pres. Madras 1512(1056). 1928; Hook. f., Fl. Brit. India 6: 292. 1892.

Climbers, stem terete, twining to right, glabrous. Leaves 8-15 x 2-5 cm, opposite, elliptic, ovate or oblong, rounded or acute at base, 3-5 nerved; margins coriaceous; petiole to 3 cm long. Spike 2-6 cm long, slender, 3-6 together along the peduncle; peduncle 15-20 cm long; bracts lanceolate. Male tepals ovate, obtuse. Stamens 6. Female flowers distant; tepals 1mm long, orbicular, glabrous. Capsule 20 x 30 mm, glabrous.

Chavachi, *KVB 31287*

Fl. & Fr.: August-November

Distribution: Rare in Evergreen forests of Chavachi.

Dioscorea pentaphylla L., Sp. Pl. 1032. 1753; Hook. f., Fl. Brit. India 6: 281. 1892; Gamble, Fl. Pres. Madras 1511(1056). 1928; Manilal & Sivar., Fl. Calicut 291. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 475. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 872. 2009. *Dioscorea pentaphylla* L. var. *communis* Prain & Burkill., J. Asiat. Soc. Bengal 10: 23. 1914; Gamble, Fl. Pres. Madras 1512(1056). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 474. 1988. *Dioscorea pentaphylla* L. var. *linnaei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 23. 1914; Gamble, Fl. Pres. Madras 1511(1056). 1928; Ramach. & V.J. Nair, Fl. Cannanore Dist. 475. 1988.

Dioscorea pentaphylla L. var. *rheedei* Prain & Burkill, J. Asiat. Soc. Bengal 10: 23. 1914; Gamble, Fl. Pres. Madras 1511(1056). 1928.

Tuberous climbers; stem terete, twining to left, usually armed with prickles. Leaves 3-5-foliolate, with bulbils in the axils; leaflets 3.5-8 x 2.5-5 cm, elliptic-ovate, base acute or attenuate, apex acute, glabrous or pubescent below; upper leaves much smaller; petiole to 8 cm long. Male flowers on slender spikes on axillary or terminal panicles, tomentose; tepals 6, greyish; outer c. 1.5 mm long, ovate, tomentose, inner c. 1 mm long, lanceolate, glabrous; stamens 3, staminodes 3. Female spike solitary, tomentose; tepals 6, biseriate, c. 1 mm long, ovate; ovary c. 3 mm long, oblong, ribbed; stigma capitate. Capsule c. 2 cm long, oblong, 3-winged, glabrescent.

Kariyenkappu, *KJD* 26359

Fl. & Fr.: September-December

Distribution: Fairly common in Plantations of Kariyenkappu and Semi-evergreen forests of Paripode.

LILIACEAE

1a. Leaves modified into cladodes, armed *Asparagus*

1b. Leaves simple and end in a tendril, unarmed *Gloriosa*

ASPARAGUS L., Sp. Pl. 1028. 1753.

Asparagus racemosus Willd., Sp. Pl. 2: 152. 1799; Hook. f., Fl. Brit. India 6: 316. 1892; Gamble, Fl. Pres. Madras 1517(1060). 1928; Manilal & Sivar., Fl. Calicut 293. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 880. 2009. *Protasparagus racemosus* (Willd.) Oberm., S. Afr. J. Bot. 2: 244. 1983.

Woody perennial climbers; stem often spinescent, terete, green; rootstock with fascicled elongated tuberous roots. Cladodes from the axils of scale leaves in clusters of 2-6, 0.8-1.5 x 0.1-0.3 cm, linear-falcate, slightly triquetrous, base narrow, apex acute. Racemes 2.5-5 cm long, slender, axillary, solitary or clustered. Flowers bisexual, 5-6 mm across; bracts triangular; pedicel c. 1 mm long. Perianth-lobes 6, white, c. 3 x 0.5 mm, oblong, acute. Stamens 6, adnate to the perianth lobes; filaments subulate. Ovary 2-3 mm long, globose to slightly 3-gonous, 3-celled; ovules 2 per cell; stigma 3, recurved. Berry 4-6 mm diam., globose, purple on ripening; seeds 2-5, c. 2 mm across, globose.

Ambalappara, *KJD* 22574

Fl. & Fr.: July-August

Distribution: Fairly common in Evergreen forests of Ambalappara, Chavachi, Pothurumi and Kannadivechakunnu.

GLORIOSA L., Sp. Pl. 305. 1753.

Gloriosa superba L., Sp. Pl. 305. 1753; Hook. f., Fl. Brit. India 6: 358. 1892; Gamble, Fl. Pres. Madras 1519(1061). 1928; Manilal & Sivar., Fl. Calicut 292. 1982; Ansari, Fl. Kasaragod Div. 389. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 477. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 881. 2009.

Herbaceous climbers with tuberous roots. Leaves sessile, alternate, opposite or whorled, 5-13 x 1.5-4 cm, ovate-lanceolate, base cordate or amplexicaule, apex acuminate, ending in a tendril. Flowers bisexual, showy, axillary, solitary or in few-flowered, terminal racemes; pedicel to 7 cm long. Perianth-lobes 6, free, 5-7 x 0.8-1.2 cm, linear-oblong, reflexed or spreading, base narrow, margin undulate, apex acuminate, yellowish below and reddish above. Stamens 6; filaments 3-4 cm long; anthers oblong-linear, versatile. Ovary 1 x 0.5

cm, oblong, 3-locular; ovules numerous; style to 4 cm long, deflexed; stigmas 3. Capsule 3-5 x 1-2 cm, ellipsoid-oblong; seeds many, 3 mm, globose, warty.

Paripode, *KJD 26384*

Fl. & Fr.: July-December

Distribution: Semi-evergreen forests of Paripode near Farm.

SMILACACEAE

SMILAX L., Sp. Pl. 1028. 1753.

1a. Leaves broad, 10-15 x 8-13 cm across; berry globose *S. wightii*

1b. Leaves narrow, 6-12 x 3-6 cm across; berry ovoid *S. zeylanica*

Smilax wightii A. DC. in A. & C. DC., Monogr. Phan. 1: 174. 1878; Hook. f., Fl. Brit. India 6: 310. 1892; Gamble, Fl. Pres. Madras 1519(1061). 1928; Swarup. et al., Shola For. Kerala 85. 1998; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 874. 2009.

Climbers, branchlets terete, armed with prickles. Leaves simple, alternate, 10-15 x 8-13 cm, broadly ovate, apex obtuse, cuspidate, base cordate, 5-ribbed; petiole 1-3 cm long, sheath narrow, flagellate. Peduncle to 10 cm long; umbels alternate, 2 or 3. Flowers many; pedicels 1.5 cm long, 2 cm in fruit. Perianth 6-partite, free, greenish-yellow. Berry 7 x 7 mm, globose.

Kattikkari state Boundary, *KJD 26025*

Fl. & Fr.: November-May

Distribution: Rare in Evergreen forests of Kattikkari. Endemic to southern Western Ghats.

Smilax zeylanica L., Sp. Pl. 1029. 1753; Hook. f., Fl. Brit. India 6: 309. 1892; Gamble, Fl. Pres. Madras 1518(1061). 1928; Manilal & Sivar., Fl. Calicut 292. 1982; Ansari, Fl. Kasaragod Div. 389. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 478. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 875. 2009. *Smilax macrophylla* Roxb., Fl. Ind. 3: 793. 1832; Hook. f., Fl. Brit. India 6: 310. 1892.

Climbing shrubs; stem prickly. Leaves simple, alternate, 6-12 x 3-6.5 cm, ovate-oblong or ovate-lanceolate, base rounded, acute to shortly cuspidate at apex, coriaceous, glabrous and glossy, 3-5-ribbed from base; petiole to 2 cm long, tendril from either sides of the petiole. Umbels axillary, 1-3; peduncles 2-3 cm long. Flowers unisexual; pedicels 5-6 mm long; bracts oblong. Perianth 6-partite, free, greenish, c. 7 mm long, oblong. Stamens in male flowers 6, free; filaments flat, apex callose; pistillode 0. Ovary in female flowers 3-lobed, 3-celled; ovules 1 or 2 per cell; style 3-fid; staminodes 3-6. Berry 0.8-1 x 0.6-0.8 cm; seeds 1-3, 3-4 mm across, globose.

Chavachi, *KJD 26121*

Fl. & Fr.: July-January

Distribution: Fairly common in Plantations of Kariyenkappu; Evergreen forests of Kattikkari, Chavachi, Pothurumi, Narikkadavu, Paripode etc.

COMMELINACEAE

1a. Epiphytic herbs; branches prostrate *Belosynapsis*

1b. Terrestrial herbs, 2

2a. Petals united into a tube *Cyanotis*

2b. Petals free 3

- 3a. Cymes paniced 4
 3b. Cymes enclosed in spathaceous bracts *Commelina*
 4a. Fertile stamens 6 *Floscopa*
 4b. Fertile stamens 2 or 3 5
 5a. Cells of ovary 2-many ovuled *Murdannia*
 5b. Cells of ovary 1-ovuled 6
 6a. Capsule pubescent; staminodes 2 *Rhopalephora*
 6b. Capsule glabrous; staminodes absent *Dictyospermum*

BELOSYNOPSIS Hassk., *Flora* 4: 259. 1871.

Belosynopsis vivipara (Dalz.) C.E.C. Fisch., *Bull. Misc. Inform. Kew* 1928: 252. 1928 & Gamble, *Fl. Pres. Madras* 1551(1082). 1931; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 885. 2009. *Cyanotis vivipara* Dalz. in Hook.'s *J. Bot. Kew Gard. Misc.* 3: 226. 1851; Hook. f., *Fl. Brit. India* 6: 388. 1892.

Epiphytic herbs with creeping branches; 5-15 cm high; stem hirtus. leaves basal and cauline, basal larger, to 10 x 1.5 cm, oblong-lanceolate, densely villous below, glabrous above; sheath tubular, densely hairy. Cymes sessile, few, along the creeping branches; bracteoles absent. Flowers few together. Septemberals 3, free, 1.5 x 1.5 mm, elliptic, acute, hairy. Petals 3, free, 3 x 1.5 mm, obovate, acute, pink. Stamens 6, filaments beard. Ovary obovate, hairy, 3-celled, 2-ovules in each cell. Capsule 6-seeded.

Kattikkari, *NS & KJD 31909*; Ambalappara, *KJD 25443*

Fl. & Fr.: August-December

Distribution: Rare in Evergreen forests of Kattikkari, Mullenpara and Ambalappara. Endemic to Western Ghats; Conservation status: Vulnerable.

COMMELINA L., *Sp. Pl.* 40. 1753.

- 1a. Capsule 3 celled *C. paludosa*
 1b. Capsule 2 celled 2
 2a. Spathe auricled at one side, hairy *C. benghalensis*
 2b. Spathe not auricled, glabrous *C. clavata*

Commelina benghalensis L., *Sp. Pl.* 41. 1753; Hook. f., *Fl. Brit. India* 6: 370. 1892; Gamble, *Fl. Pres. Madras* 1539(1075). 1931; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 481. 1988; Manilal & Sivar., *Fl. Calicut* 297. 1982; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 886. 2009.

Diffuse herbs, rooting at lower nodes; rootstock with cleistogamous flowers. Leaves 3-5 x 2-3.5 cm, ovate or elliptic-ovate, base rounded or subtruncate, apex obtuse or acute, pubescent, margin ciliate; petiole to 8 mm long; sheath to 1.5 cm long, apex with rufous hairs. Spathe 1.5 cm across, funnel-shaped, truncate at apex, pubescent. Septemberals subequal, c. 2.5 mm long; outer ones linear; inner ones orbicular. Petals blue, larger ones c. 4 x 4.5 mm, broadly ovate. Stamens 3; staminodes 2. Ovary to 1mm long. Capsule to 5 mm long, ellipsoid, 3-celled; seeds 5, pitted.

Paripode, *KJD 25575*

Fl. & Fr.: July-November

Distribution: Fairly common in Semi-evergreen forests of Paripode.

Commelina clavata Clarke, *Comm. Cyrt. Bengal t.* 5. 1874; Hook. f., *Fl. Brit. India* 6: 371. 1892; Gamble, *Fl. Pres. Madras* 1539(1074). 1931.

Herbs. Leaves to 9 x 1 cm, lanceolate, apex acute, base slightly cordate, sheath to 2 cm, open, long ciliate. Cymes axillary; peduncles to 5 cm, spathe

4.5 x 2 cm, broadly ovate, acuminate, base cordate. outer septemnerals 5 mm, cucullate; inner 2, smaller. Petals 9 mm, obovate; filaments 8 mm, hairy. Ovary 2 mm, style 6 mm, stigma globose. Capsule 2-celled, constructed at the middle; seeds 4, 2 mm, pitted.

Ambalappara, *KJD 25434*

Fl. & Fr.: September-June

Distribution: Common in the Grasslands of Ambalappara.

Commelina paludosa Blume, Enum. Pl. Jav. 1: 2. 1827; Ramach. & V.J. Nair, Fl. Cannanore Dist. 482. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 887. 2009. *Commelina obliqua* Buch.-Ham. ex D.Don, Prodr. Fl. Nepal. 45. 1825, nom. illeg.; Hook. f., Fl. Brit. India 6: 372. 1892; Gamble, Fl. Pres. Madras 1539(1075). 1931. *Commelina polyspatha* Wight, Ic. Pl. Ind. Or. t. 2066. 1853.

Diffuse herbs. Leaves 8-13 x 3-4 cm, lanceolate, apex acute or acuminate, base narrowed, scabrous or softly villous; sheaths to 2 cm, mouth rufous haired. Spathes to 2 x 1.5 cm, infundibular, base cordate, solitary in terminal heads. Flowers to 1 cm across, blue. Septemnerals unequal. Ovary 3-celled, 3-ovuled. Capsule 4 mm, trigonous, 3-seeded.

Near Farm, *KVB 31301*; Meenmutty, *KVB 31338*

Fl. & Fr.: November-January

Distribution: Fairly common in Evergreen forests of Meenmutty, Valayamchal, Kattikkari and Plantations of Kariyenkappu.

CYANOTIS D. Don, Prodr. Fl. Nepal. 45. 1825, *nom. cons.*

- 1a. Plants with cottony or silky hairs..... *C. thwaitesii*
- 1b. Plants with out cottony or siky hairs..... 2
- 2a. Root stock woody *c. obtusa*
- 2b. Root stock not woody 3
- 3a. Cymes enclosed in leaf sheaths *C. axillaris*
- 3b. Cymes not enclosed in leaf sheaths 4
- 4a. Stem strongly hirsute or villous 5
- 4b. Stem glabrous or with spreading hairs or line hairs below internodes..... 6
- 5a. Stem hirsute, roots tuberous *C. tubrosa*
- 5b. Stem villous, roots not tuberous *C. villosa*
- 6a. Capsules puberulous at apex, seeds ovoid-ellipsoid..... *C. racemosa*
- 6b. Capsules almost glabrous, seeds trigonus..... *C. cristata*

Cyanotis axillaris (L.) D. Don, Prodr. Fl. Nepal. 46.1825; Hook. f., Fl. Brit. India 6:388.1892; Gamble, Fl. Pres. Madras 1550(1082). 1931; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 888. 2009. *Commelina axillaris* L., Sp. Pl. 42. 1753. *Tonningia axillaris* (L.) O. Ktze., Rev. Gen. Pl. 2: 722. 1891; Ramach. & V.J. Nair, Fl. Cannanore Dist. 488. 1988; Joseph, Aquatic Angiosp. Malabar 299. 1991. *Amischophacelus axillaris* (L.) Rao & Kammathy, J. Linn. Soc. Bot. 59. 306. 966; Manilal & Sivar., Fl. Calicut 299. 1982; Ansari, Fl. Kasaragod Div. 393. 1985.

Fleshy decumbent, glabrous herbs, rooting at lower nodes, often purple-suffused. Leaves 3-7 x 0.5-0.8 cm, linear, apex acute or acuminate; sheath to 7 mm long, mouth ciliate. Inflorescence in axillary cymose clusters, enclosed within the leaf sheath; bracteoles 1-2 mm long, linear. Flowers 6-7 mm across. Calyx connate, tube 2-4 mm long, pilose; lobes lanceolate. Corolla blue; tube to 3 mm, lobes to 4 mm, ovate. Stamens 6; filaments pink with purple pilose hairs. Ovary c. 1.5 mm, woolly, 3-celled; ovules 2 per cell on axile placentae; style c.1.5 mm long,

pilose; stigma 3-fid. Capsule 5-6 mm long, oblong, apex beaked; seeds 6, c. 2 mm, oblong, pitted.

Narikkadavu, *KJD 26111*

Fl. & Fr.: August-December

Distribution: Fairly common along streams in Semi-evergreen forests of Narikkadavu and Pookundu.

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825; Hook. f., Fl. Brit. India 6: 385. 1892; Gamble, Fl. Pres. Madras 1549(1081). 1931; Manilal & Sivar., Fl. Calicut 298. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 483. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 889. 2009. *Commelina cristata* L., Sp. Pl. 42. 1753.

Fleshy, robust herbs. Leaves 2-8 x 0.8-2.5 cm, ovate-oblong, base rounded or cordate, apex obtuse or acute, sparsely ciliate on margins; sheath loose, to 8 mm long, hispid. Cymes mostly terminal, recurved, 2-2.5 x 1-1.5 cm, solitary, peduncle 2-6 cm long; bracts 2.5-5 x 1-2.2 cm, leaf-like; bracteoles 0.7-1 cm long, falcately ovate, sparsely ciliate on margins. Flowers 6-7 mm across. Calyx tube c. 2 mm long; lobes 2-2.5 mm long, hirsute. Corolla pale blue to purple, 6 mm long. Staminal filaments bearded, violet. Ovary globose, hairy at apex. Capsule 2-3 mm long, subglobose; seeds c. 1 mm, trigonous, with 2 large pits on either side.

Pothurumi, *KVB 31631*

Fl. & Fr.: July-October

Distribution: Common in Evergreen forests of Pothurumi, Chavachi, Kattikkari, Mullenpara, Kannadivechakunnu, Moonamthode and Semi-evergreen forests of Paripode.

Cyanotis obtusa (Trim.) Trim., Handb. Fl. Ceylon 4: 812 1898. *Cyanotis arachnoidea* var. *obtusa* Trim., J. Bot. 23: 266 1885.

Herbs, perennial, creeping; rhizomes absent. Leaves alternate. Cincinni sessile, subtended by spathe-like involucral bracts; bracts imbricate, 2-seriate, falcate curved. Flowers actinomorphic. Sepals free or connate only at the base. Petals connate and tubular in the middle, free at both ends, purple, blue, or white, linear-lanceolate. Stamens 6, all fertile, equal; filaments lanate, rarely glabrous; anther locules longitudinally dehiscent. Ovary 3-loculed; ovules 2 per locule. Capsule 3-valved, obovoid-or broadly oblong, trigonous; seeds 1 or 2 hilum at adjoining end of 2 seeds.

Ambalappara, *KJD 25481*

Fl. & Fr.: July-November

Distribution: Rare in the Grasslands of Ambalappara.

Note: The present collection from the Sanctuary is a new record of occurrence to Kerala.

Cyanotis racemosa Heyne ex Hassk., Commel. Ind. 125. 1870; Santhosh Nampy & Joby Paul, Rheedeia 21: 8. 2011.

Procumbent or trailing, perennial herbs, rooting at lower nodes; internodes glabrous but with a dense line of pubescent below the fused edge of the sheath. Leaves distichous, 3.7-9.5 x 0.8-1.8 cm, cuneate at base, appressed ciliate at margins, acuminate at apex, glabrous and lustrous bright green above, densely appressed sericeous and green or maroon below; sessile; sheaths to 1.5 cm long, densely sericeous or pilose; mouth long ciliate. Inflorescence clustered at the ends of shoots, composed of 4 or 5-stalked cincinni; stalk ca 1 cm long; bracts ovate-lanceolate, slightly exceeding the cincinnus, entire, ciliate at margins, glabrous; bracteoles ovate to lanceolate, falcate, ciliate at margins, acuminate at apex, glabrous. Sepals 3, oblanceolate, acuminate at apex, pilose along the keel,

towards apex and margin below, glabrous above. Petals 3, acute at apex, united for $\frac{1}{2}$ their length from base, white. Stamens 6, exceeding the corolla by 6-8 mm; filaments swollen subapically, densely bearded; hairs pale violet or blue, white-tipped; anthers yellow. Ovary oblong, densely tomentose at apex; style glabrous with a fusiform subapical swelling. Capsules 2.5-3 x 2-3 mm, puberulous at apex, constricted at middle, 3-loculed; two locules with 2 seeds, one with 1 seed, ovoid to ovoid-ellipsoid, 1.3-2.5 x 1.1-1.5 mm; testa striate, pitted, pale to dark brown.

Meenmutty, *KJD 25401*

Fl. & Fr.: December-March

Distribution: Rare in Evergreen forests of Meenmutty.

Cyanotis thwaitesii Hassk., Commelin. Ind. 136 1870. *Cyanotis arachnoidea* var. *thwaitesii* (Hassk.) R.S.Rao & Kammathy, Bull. Bot. Surv. India 6: 2. 1964. *Cyanotis fasciculata* var. *thwaitesii* (Hassk.) C.B.Clarke, Monogr. Phan. 3: 254. 1881.

Perennial herbs, prostrate, densely covered with white-cottony hairs. Leaves ovate to linear-lanceolate, cottony hairy. Cymes terminal; peduncle 4 cm long; bracts 1.7 x 1 cm, ovate, acute, hairy; bracteoles curved, densely cottony hairy. Flowers densely packed; sepals 6 x 1.5 mm, united at the base, densely long hairy; corolla tube 7 mm long; lobes triangular, acute; filaments 12 mm long, bearded; ovary densely hairy at apex; style bearded. Capsule 2.5 mm long, oblong, hairy; seeds transversally rugose, black.

Ambalappara, *KJD 25506*

Fl. & Fr.: July-November

Distribution: Common in Evergreen forests of Ambalappara.

Note: The present collection from the Sanctuary is a new record of occurrence to Kerala.

Cyanotis tuberosa (Roxb.) Schult. f., Syst. Veg. 7:1153.1830; Hook. f., Fl. Brit. India 7:386.1892; Gamble, Fl. Pres. Madras 1549(1081). 1931. *Tradescantia tuberosa* Roxb., Pl. Corom. t. 108. 1799. *Cyanotis concanensis* Hassk., Commelin. Ind. 114. 1870; Vajr., Fl. Palghat Dist. 519. 1990. *Cyanotis sahyadrica* Blatt., Journ. Bombay Nat. Hist. Soc. 33: 77. 1928.

Perennial herbs with tuberous roots; stem hairy on one side. Leaves basal, 20-35 x 1.5 cm, oblong, acute, margin white, serrulate, glabrous; cauline leaves much smaller. Cymes terminal, umbellate, 2-5 together, curved; bracts 2-2.5 x 0.7 cm, ovate, hairy; bracteoles numerous, 8 x 3 mm, falcate, hairy along the margins, many. Flowers many. Sepals 7 x 2 mm, oblanceolate, hairy. Corolla campanulate, tube 7-8 mm long, lobes acute, violet. Staminal filaments bearded on upper part; style bearded and bulged below stigma. Capsule ovoid, pilose above; seeds faintly rugose, black.

Ambalappara, *KJD 25509*

Fl. & Fr.: October-December

Distribution: Fairly common in Grasslands of Ambalappara. Endemic to Peninsular India.

Cyanotis villosa (Spreng.) Schult. f., Syst. Veg. 7: 1155. 1830; Hook. f., Fl. Brit. India 6: 387. 1892; Gamble, Fl. Pres. Madras 1540(1081). 1931. *Tradescantia villosa* Spreng., Syst. Veg. 2: 116. 1825. *Cyanotis lanceolata* Wight, Ic. t. 2085. 1853.

Erect or procumbent herbs; stem terete, villous. Leaves 2-8 x 0.8-2 cm, ovate, cordate at base, villous above and below, sessile; sheath tubular, thickly villous. Cymes terminal and upper axillary, sessile; bracts 1.2 cm long, ovate-lanceolate, villous; bracteoles ovate, curved, ciliate along the margins. Flowers

few. Sepals 6-7 mm long, free, lanceolate, keel ciliate. Corolla tube 6-7 mm long, lobes 4 mm long, obtuse, blue with red glands. Filaments 11 mm long, bearded; style dilated below the stigma. Capsule 2-3 mm long, hairy at apex; seeds paired.

Meenmutty road, *KJD 31514*

Fl. & Fr.: November-January

Distribution: Rare in Evergreen forests of Meenmutty and Kurumbamkallu.

DICTYOSPERMUM Wight, Ic. 6: 29, t.t. 2069, 2071. 1853.

1a. Panicle longer than leaves *D. montanum*

1b. Panicle shorter than leaves..... *D. ovalifolium*

Dictyospermum montanum Wight, Ic. t. 2069. 1853; Ramach. & V.J. Nair, Fl. Cannanore Dist. 484. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 890. 2009. *Aneilema montanum* (Wight) Thw., Enum. Pl. Zeyl. 322. 1864; Hook. f., Fl. Brit. India 6:382.1892; Gamble, Fl. Pres. Madras 1546(1079). 1931.

Herbs. Leaves clustered towards apex of stem, 5-13 x 2.5-5 cm, elliptic-lanceolate, base narrowed, apex acuminate; petiole to 1.5 cm long; sheath to 3 cm long. Panicles terminal, 8-17 cm long, covered with hooked hairs; bracts leafy. Flowers 8-10 mm across; pedicels 4-7 mm long. Sepals 3, 3-4 x 2-3 mm, obovate, obtuse, concave. Petals 3, white, 5-6 x 3-4 mm, ovate, obtuse. Stames 3; filaments 2-3 mm long; staminodes 0. Ovary 3-celled; c. 1.5 mm long; ovule 1 in each cell; style c. 2 mm long. Capsule 2-3 mm across, globose, glabrous; seeds hemispheric, rugose.

Paripode, *KJD 25411*; Pothanplavu, *KJD 26185*

Fl. & Fr.: July-October

Distribution: Fairly common in Semi-evergreen forests of Paripode and Pothanplavu. Endemic to Peninsular India.

Dictyospermum ovalifolium Wight, Ic. t. 2070. 1853; Ramach. & V.J. Nair, Fl. Cannanore Dist. 484. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 890. 2009. *Aneilema ovalifolia* (Wight) Hook.f. ex Clarke in A. & C. DC., Monogr. Phan. 3: 218. 1881; Hook. f., Fl. Brit. India 6: 328. 1892; Gamble, Fl. Pres. Madras 1546(1079). 1934.

Herbs; erect or decumbent at base. Leaves to 15 x 5 cm, scattered, upper ones verticillate, usually sessile, elliptic, acuminate, base acute, glabrous; sheath 2 cm long, glabrous; mouth oblique. Panicle pyramidal, congested; branches and pedicels recurved, puberulus. Flowers in a group of 3-6. Sepals 3 x 2 mm, obovate, obtuse, glabrous. Petals 3 x 2 mm, pale blue with red nerves. Stamens 3, filaments naked. Capsule 7 x 5 mm, globose.

Chavachi, *KJD 31802*

Fl. & Fr. : October-December

Distribution: Rare in Evergreen forests of Chavachi. Endemic to Western Ghats; Conservation status: Endangered.

FLOSCOPA Lour. Fl. Cochinch. 1: 192. 1790

Floscopa scandens Lour., Fl. Cochinch. 193. 1790; Hook. f., Fl. Brit. India 6: 390. 1892; Gamble, Fl. Pres. Madras 1522(1083). 1931; Ansari, Fl. Kasaragod Div. 394. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 485. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 890. 2009. *Dithyrocarpus rothii* Wight, Ic. t. 208. 1839.

Creeping or suberect marshy herbs; stem terete, pubescent along one line. Leaves scattered, 5-10 x 2-1.5 cm, elliptic-lanceolate, acuminate, acute at base, glabrous; sheath tubular, mouth oblique, hairy. Panicle 3-6 cm long;

axis and branches pubescent. Flowers many, 3-5 mm across, regular, bisexual. Sepals 3 x 2 mm, ovate, pubescent. Petals 3 x 2 mm, obovate, glabrous, rose coloured. Stamens 6, filaments free, glabrous; anthers small, obtuse, with broad connective. Ovary 3-celled; ovule solitary in each cell. Capsule broadly ovoid; seeds elliptic, wrinkled, grey.

Ambalappara, KVB 31584

Fl. & Fr.: January-December

Distribution: Fairly common in Evergreen forests of Ambalappara and Plantations of Kariyenkappu near rivers or streams.

MURDANNIA Royle, Ill. Bot. Himalayan Mts. t. 95. 1839, *nom. cons.*

- 1a. Seeds one seriate in each cell 2
- 1b. Seeds two seriate in each cell 6
- 2a. Cells of the ovary 2 or 3 ovuled 3
- 2b. Cells of the ovary 3-many ovuled 4
- 3a. Fertile branches arise from base of vegetative leaves 4
- 3b. Fertile branches arise from terminal or axillary leaves *M. nudiflora*
- 4a. Fertile branches one or two, panicle cymose *M. simplex*
- 4b. Fertile branches two or more, panicle or subcapitate *M. loriformis*
- 5a. Inflorescence on leafy erect stems, dichotomously branched *M. japonica*
- 5b. Inflorescence axillary or terminal 5
- 6a. Inflorescence branched panicles *M. spirata*
- 6b. Inflorescence cymes *M. pauciflora*
- 7a. Flowers few, axillary, clustered *M. lanuginosa*
- 7b. Flowers in terminal panicle *M. semiteres*

Murdannia japonica (Thunb.) Faden, Taxon 26: 142. 1977; Ramach. & V.J. Nair, Fl. Cannanore Dist. 486. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 892. 2009. *Commelina japonica* Thunb., Trans. Linn. Soc. London 2: 332. 1794. *Aneilema lineolatum* Kunth, Enum. Pl. 4: 69. 1843; Hook. f., Fl. Brit. India 6: 370. 1892; Gamble, Fl. Pres. Madras 1544(1078). 1931. *Aneilema latifolium* Wight, Ic. t. 2072. 1853.

Obliquely erect stout herbs; roots tuberous; stem rounded, smooth. Leaves to 23 x 6 cm basal and cauline, ovate, acute at apex, cordate at base, glabrous, coriaceous, sessile; cauline leaves smaller. Panicle to 20 x 10 cm, terminal, lax. Flowers 12 mm across, solitary or 2-3 together, pedicelled. Sepals 4-5 x 2 mm, oblong-obtuse, red-glandular. Petals white, 6 x 4 mm, obovate, obtuse, pale blue or white. Stamens 3, filaments bearded; staminodes 2-lobed, bearded. Capsule globose, beaked; seeds 2 x 1 mm, trigonous, with two round markings, tuberculate or reticulate, dark brown.

Chullikandam, KJD 26102

Fl. & Fr.: May-September

Distribution: Rare in Moist deciduous forests of Chullikandam-Narikkadavu area.

Murdannia lanuginosa (Wall. ex Clarke) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. 15a: 173. 1930; Ramach. & V.J. Nair, Fl. Cannanore Dist. 486. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 892. 2009. *Aneilema lanuginosa* Wall. ex Clarke in A. & C. DC., Monogr. Phan. 3: 214. 1881; Hook. f., Fl. Brit. India 6: 380. 1892; Gamble, Fl. Pres. Madras 1545(1079). 1931.

Erect or suberect, branched herbs; fibrous roots often tuberous, slightly thickened; stem angular, glabrous or hairy. Leaves 3-6 x 0.4-0.8 cm, cauline,

alternate, oblong-lanceolate or lanceolate, margin undulate, apex acute or shortly acuminate, base rounded, more or less amplexicaule, prominently striate, hairy; sheath 8-12 mm long, hairy. Flowers 5-6 mm long, 1 or 2, axillary to the upper leaf-sheaths; pedicels 2-4 cm long, erect or slightly bent in fruits, jointed at middle, hairy below the joints; bracteoles 2 at joints, ca. 1 mm long, membranous, ovate, obtuse. Calyx lobes 3, free, slightly unequal, 6 x 2 mm, elliptic-oblong, subacute, straw-coloured, persistent. Petals 3, free, orange-yellow, bluish when dry, obovate, slightly longer than calyx lobes. Fertile stamens 3; filaments bearded; anthers 2-celled; staminodes 3. Capsule 5-7 mm long, oblong, trigonous, cuspidate with persistent style, 3-celled; seeds 3 or more, angular, pitted.

Ambalappara, *KJD 25442*

Fl. & Fr.: August-December

Distribution: Rare in Grasslands of Ambalappara. Endemic to Peninsular India; Conservation status: Vulnerable.

Murdannia loriformis (Hassk.) Rao et Kammathy, Bull. Bot. Surv. India 3: 393. 1961. *Aneilema loriformis* Hassk., Pl. Jung. 143. 1852. *Aneilema terminale* Wight, Ic. t. 2076. 1853.

Herbs perennial, roots fibrous. Main stem undeveloped, fertile stem 1-5, arising from below the main stem, glabrous or puberulent on 1 side. Basal leaves linear, 5-15 x 0.5-1 cm. Inflorescence terminal on fertile branches, solitary or 2 to 5 forming a panicle or subcapitate; involucre bracts leaflike but smaller than leaves. Pedicels slightly curved 2.5-4 mm. Sepals 3, free, ovate elliptic, herbaceous. Petals 3, free, violet-blue, obovate-orbicular. Fertile stamens 2, staminodes 3. Capsules ovoid-globose, trigonous, seeds 2 per lobe.

Kariyenkappu, *KJD 31829*

Fl. & Fr.: September-December

Distribution: Rare in Plantations of Kariyenkappu.

Murdannia nudiflora (L.) Brenan, Kew Bull. 1952: 189. 1952; Manilal & Sivar., Fl. Calicut 296. 1982; Ansari, Fl. Kasaragod Div. 395. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 486. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 893. 2009. *Commelina nudiflora* L., Sp. Pl. 41. 1753. *Aneilema nudiflorum* (L.) R. Br., Prodr. 271. 1810; Hook. f., Fl. Brit. India 6: 378. 1892; Gamble, Fl. Pres. Madras 1545(1078). 1931.

Procumbent herbs; rooting at lower nodes. Leaves sessile, 6-11 x 0.5-1.2 cm, linear or linear-lanceolate, base rounded, apex acute or acuminate; sheath to 1.2 cm long, margin ciliate. Flowers in terminal and axillary few-flowered, subglobose or subcorymbose panicles. Sepals 2 mm long, oblong, obtuse. Petals 2-2.5 mm long, oblong, acute, bluish-purple. Staminal filaments bearded; staminodes 3 with filaments bearded or not. Ovules 2 in each cell. Capsule 2.5-3.7 mm across, globose; seeds 2-per locule, c.1 mm, cuboid, deeply pitted.

Kariyenkappu, *KJD 31830, 31865, 31803*

Fl. & Fr.: September-December

Distribution: Common in Plantations of Kariyenkappu and Semi-evergreen forests of Paripode.

Murdannia pauciflora (Wight) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 15a: 173. 1930; Ramach. & V.J. Nair, Fl. Cannanore Dist. 487. 1988. *Aneilema pauciflorum* Wight, Ic. t. 2077. 1853; Hook. f., Fl. Brit. India 6: 378. 1892; Gamble, Fl. Pres. Madras 1545(1078). 1931. *Murdannia wightii* Rao &

Kammathy, Notes Roy. Bot. Gard. Edinb. 25: 184. 1964; Manilal & Sivar., Fl. Calicut 295. 1982; Ansari, Fl. Kasaragod Div. 397. 1985.

Decumbent, spreading herbs; rooting at lower nodes. Leaves 2-3 x 1-1.5 cm, ovate-lanceolate, base rounded or cordate, apex acute; sheath 5 mm long, hairy. Flowers 1-4 in axillary and terminal cymes, 4-5 mm across; pedicels to 1 cm long, usually deflexed in fruits. Sepals 3, c. 3 mm long, oblong, acute. Petals brownish-yellow, oblong, acute. Fertile stamens 3, filaments glabrous; staminodes 3. Capsule 4-5 mm long, oblong-fusiform, subtrigonus, acute; seeds 4-6 in each cell, 1-seriate, black, sparsely pitted.

Kariyenkappu, *KJD 31862*

Fl. & Fr.: September-November

Distribution: Rare in Plantations of Kariyenkappu, near streams.

Murdannia semiteres (Dalz.) Sant., Poona Agri. Coll. Mag. 41(4): 15. 1951; Manilal & Sivar., Fl. Calicut 296. 1982; Ansari, Fl. Kasaragod Div. 396. 1985. *Aneilema semiteres* Dalz. in Hook.'s, J. Bot. Kew Gard. Misc. 3: 138. 1851. *Aneilema paniculatum* Wall. ex Clarke in A. & C. DC., Monogr. Phan. 3: 215. 1881, *nom. illeg.*; Gamble, Fl. Pres. Madras 1546(1079). 1931. *Dichaespermum juncooides* Wight, Ic. t. 2073. 1853. *Dichaespermum paniculatum* (Wall. ex Clarke) Hook. f. & Thoms. in Hook.f., Fl. Brit. India 6: 381. 1892, pro syn. *Murdannia juncooides* (Wight) Rao & Kammathy, Bull. Bot. Surv. India 6: 3. 1964; Sasidh. & Sivar., Fl. Pl. Thrissur For. 477. 1996.

Erect tufted slender herbs. Leaves 4-13 x 0.1-0.3 cm, linear, filiform, semiterete, apex acuminate. Panicles terminal, lax, longer than leaves, branches capillary; peduncles reddish, 8-20 cm long. Flowers blue; pedicels filiform; bracts minute, ocreate. Sepals obovate, acute. Petals blue, 2-4 mm long, obovate, apex somewhat 3-lobed. Staminal filaments naked. Ovary glabrous; ovules 2-seriate in each cell. Capsule 2-3 mm long, subglobose or ovoid, angular; seeds 2-seriate, 6-8 in each cell, smooth, compressed.

Ambalappara, *KJD 25502*

Fl. & Fr.: October-December

Distribution: Fairly common in Evergreen forests of Ambalappara, Kattikkari, Mullenpara and Asthippara. Endemic to Peninsular India.

Murdannia simplex (Vahl) Brenan, Kew Bull. 1952: 186. 1952. *Commelina simplex* Vahl, Enum. Pl. 2: 177. 1805. *Aneilema sinicum* Ker-Gawl. in Edgew., Bot. Reg. t. 659.1822; Hook. f., Fl. Brit. India 6:379.1892; Gamble, Fl. Pres. Madras 1545(1078). 1931. *Aneilema secundum* Wight, Ic. t.2075. 1853.

Suberect herbs; roots tuberous; stem 40-65 cm high, terete, glabrous. Leaves basal and cauline, 10-20 x 1-1.5 cm, linear-lanceolate, acute; cauline leaves smaller; sheath open, 2 cm long, ciliate. Cymes to 8 cm long, terminal, paniced; peduncle to 8 cm long. Flowers 5-20 in a cymes; pedicel 5-6 mm long. Sepals 6 x 3 mm, elliptic, acute at apex. Petals 8 x 5 mm, obovate, obtuse, narrow; staminodes 3, yellow, 3-lobed. Capsule 6.5 x 3 mm, ellipsoid, acute, beaked; seeds 3 x 2 mm, ellipsoid, rugose, brown.

Ambalappara, *KJD 25462*

Fl. & Fr.: September-November

Distribution: Rare in Grasslands of Ambalappara.

Murdannia spirata (L.) Brueck. in Engl. & Prantl, Naturl. Pflanzenfam. (ed. 2) 15a: 173. 1930; Manilal & Sivar., Fl. Calicut 296. 1982; Ansari, Fl. Kasaragod

Div. 396. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 487. 1988. *Commelina spirata* L., Mant. Pl. 2: 176. 1771. *Aneilema spiratum* (L.) Sweet, Hort. Suburb. London 12: 1808; Hook. f., Fl. Brit. India 6: 377. 1892; Gamble, Fl. Pres. Madras 1546(1078). 1931.

Erect or diffuse herbs with fibrous roots. Leaves 1-4 x 0.5-1.2 cm, ovate-lanceolate, base cordate and semi-amplexicaule, apex acute; sheath c.1 cm long, ciliate at mouth. Flowers c. 6 mm across, in few-flowered terminal and axillary panicles; bracts to 2 mm long, ovate; pedicel 3-5 mm long, filiform. Sepals 3-3.5 mm long, ovate-oblong. Petals bluish or violet, 3-4 mm long, oblong. Fertile stamens 3, filaments bearded; staminodes 2. Ovules 3 in each cell. Capsule 4-5 mm long, oblong, trigonous; seeds 3 in each cell, c. 1 mm, angular, cuboid, rugose, light brown.

Kariyenkappu, *KJD 31863, 31864*

Fl. & Fr.: August-November

Distribution: Fairly common in Plantations at Kariyenkappu.

RHOPALEPHORA Hassk., Bot. Zeitung (Berlin) 22: 58. 1864.

Rhopalephora scaberrima (Blume) Faden, Phytologia 37: 480. 1977. *Commelina scaberrima* Blume, Enum. Pl. Jav. 1: 4. 1827. *Aneilema scaberrimum* (Blume) Kunth, Enum. Pl. 4:69.1843; Hook. f., Fl. Brit. India 6:382.1892; Gamble, Fl. Pres. Madras 1546(1079). 1931; Ansari, Fl. Kasaragod Div. 393. 1985. *Dictyospermum scaberrimum* (Blume) Morton ex Panigrahi, Phytologia 29: 338. 1974 (1975); Sasidh., Fl. Chinnar WLS 320. 1999. *Aneilema scaberrimum* var. *fruticosum* C.B.Clarke in J.D.Hooker, Fl. Brit. India 6: 383. 1892.

Erect herbs, to 1 m tall. Leaves scattered, oblong-lanceolate, acuminate, base rounded, narrowed into a petiole, hispid above and glabrous below, to 15 x 3.5 cm, sheath hispid, to 2.5 cm long. Panicle terminal, glandular pubescent. Flowers blue, 0.8 cm across. Sepals basally connate. Ovary 3-celled; ovule 1 in each cell. Capsule globose, pubescent 3.5 mm across; seeds planoconvex, glandular.

Paripode, *KJD 25415*; Moonamthode, *KJD 31842*

Fl. & Fr.: July-September

Distribution: Common in Semi-evergreen forests of Paripode; Evergreen forests of Moonamthode, etc.

JUNCACEAE

JUNCUS L., Sp. Pl. 325.1753.

Juncus prismatocarpus R. Br. **ssp. leschenaultii** (Gay ex Laharpe) Kirschner, Preslia 74: 249. 2002; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 894. 2009. *Juncus leschenaultii* Gay ex Laharpe, Essai Monogr. Junc. 49. 1825. *Juncus prismatocarpus* var. *leschenaultii* (Gay) Buchenau in Engl., Bot. Jahrb. Syst. 6: 205. 1885. *Juncus prismatocarpus* sensu Hook. f., Fl. Brit. India 6: 395. 1892 p.p.; Gamble, Fl. Pres. Madras 1553(1084). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 489. 1988.

Tufted herbs, root stock creeping. Leaves both radical and cauline, to 6 x 0.3 cm, terete, hollow, septate; sheath to 2 cm, open, auricled. Cymes terminal, corymbose, 10-15 cm; bracts 1.5 mm, ovate, acuminate. Outer perianth lobes concave, 3 mm, lanceolate, acute, hyaline; filaments 1.5 mm.

Ovary 0.8 mm, one celled, many ovuled, stigma 3-lobed, linear, twisted.
Capsule 3 mm, prismatic.

Ambalappara, NS & KJD 25470

Fl. & Fr.: February-August

Distribution: Rare in Evergreen forests of Ambalappara.

ARECACEAE/PALMAE

- 1a. Climbing shrubs; fruits covered with scales Calamus
- 1b. Erect trees or shrubs; fruits not covered with scales 2
- 2a. Leaves bipinnate Caryota
- 2b. Leaves unipinnate 3
- 3a. Leaflets with unequal auricle Arenga
- 3b. Leaflets with out auricle 4
- 4a. Lower leaflets modified into spines; shrubs about 1m tall Phoenix
- 4b. Spines absent; shrubs more than 2 m tall Pinanga

ARENKA Labill., Mem. Inat. Par. 4: 209. 1801, *nom. cons.*

Arenga wightii Griff., Calcutta J. Nat. Hist. 5: 475.1845; Hook. f., Fl. Brit. India 6:422.1892; Gamble, Fl. Pres. Madras 1588(1087). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 489. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 894. 2009.

Monoecious palms; trunk to 6 m tall, covered with persistent leaf sheaths, caudex 10-15 m across. Leaves pinnatisect, to 8 m long; leaflets to 100 x 5 cm, linear, base auricled, glaucous below; petiole to 3 m long. Spadices to 1 m long, basipetal. Male flowers orbicular. Stamens many, free. Female flowers. Tepals 6, biseriate, similar, accrescent. Ovary 3-celled. Fruit globose.

Moonamthode, KJD 18735

Fl. & Fr.: July-September

Distribution: Rare in Evergreen forests of Moonamthode. Endemic to Western Ghats; Conservation status: Vulnerable.

CALAMUS L., Sp. Pl. 325. 1753.

- 1a. Culms solitary; fruits spherical, scales in 28 vertical series *C. delessertianus*
- 1b. Culms clustered; fruits ovoid, scales in 12 vertical series *C. thwaitesii*

Calamus delessertianus Becc., Ann. Roy. Bot. Gard. (Calcutta) 11: 276. 1908; Karthik. & Sharma, Journ. Bombay Nat. Hist. Soc. 80: 76. 1983; Renuka, Palms Kerala 22. 1999.

Solitary medium diameter canes; stem to 30 m or more long, 3 cm in diameter at base and 5-6 cm at the apex with sheath; 2-2.5 cm without sheaths. Leaves ca 2 m long, ecirrate; sheath dark green, spiny, spines bulbous based; petiole 50-60 cm long; rachis spiny; leaflets regular, to 55 x 2.5 cm, linear lanceolate; veins ciliated; cilia to 1.5 cm long, black tipped; leaf margins spinulose. Female inflorescence rather large; primary sheath coriaceous, tubular, closely sheathing at base, splits open slightly at the mouth, densely spiny; partial inflorescence to 30 cm long, attached inside the sheath, recurved, basal ones some times branched. Fruits spherical, 1.5 cm in diameter, stalk 3-10 mm long; scales straw yellow, spirally arranged, distinguished into 28 vertical series, deeply channelled in the middle; endosperm ruminant.

Meenmutty, KJD 26332

Fl. & Fr.: August-June

Distribution: Rare at Evergreen forests of Meenmutty. Endemic to Western Ghats.

Calamus thwaitesii Becc. in Hook. f., Fl. Brit. India 6: 441. 1892; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 896. 2009. *Calamus thwaitesii* Becc. var. *canaranus* Becc., Ann. Roy. Bot. Gard. (Calcutta) 11: 138. 1908; Gamble, Fl. Pres. Madras 1567(1093). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 490. 1988; Sivar. & Mathew, Fl. Nilambur 744. 1997.

Clustering and high climbing canes; stem to 20 m or more in length, with sheath to 6 cm in diam.; sheath armed with spines; spines arising from a raised rim-like surface, flat, black with yellow base; knee and ochrea absent; flagellum, petiole, rachis and sheath armed with stout spines in oblique whorls. Leaves 2 m long; leaflets grouped. Fruit ca. 2 x 1.3 cm, ovoid, scales in 12 vertical rows, with median grooves, yellow with brown margins.

Kariyenkappu, NS & KVB 31312

Fl. & Fr.: March-January

Distribution: Common in Semi-evergreen forests of Valayamchal, Paricode and Evergreen forests of Meenmutty.

CARYOTA L., Sp. Pl. 1189. 1753.

Caryota urens L., Sp. Pl. 1189. 1753; Hook. f., Fl. Brit. India 6: 422. 1892; Gamble, Fl. Pres. Madras 1560(1089). 1931; Manilal & Sivar., Fl. Calicut 300. 1982; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 898. 2009.

Monoecious stout tall palms, 16-20 m tall, 30-50 cm diam., trunk smooth with prominent annular leaf-scars. Leaves bipinnate, 4-6 m long; pinnae 5-7 pairs, to 1.5 m long; leaflets broadly cuneate, fan-shaped, 12-20 cm long, 7-10 cm wide at wider portion, raemorse at apex, many ribbed. Spadix interfoliar, shortly peduncled, much branched, pendulous, to 4 m long; spathes few, 40-50 cm long. Flowers many, in triads with female flower in the middle. Sepals 3, rounded, imbricate. Petals linear-oblong, valvate. Stamens many. Ovary 3-celled, 3-gonous; ovule 1-per locule. Fruit c. 2 cm across, globose, reddish purple; seeds plano-convex, subreniform.

Meenmutty, KJD 22575

Fl. & Fr.: January-April

Distribution: Fairly common in Evergreen forests of Meenmutty and Chavachi.

PHOENIX L., Sp. Pl. 1188. 1753.

Phoenix loureiroi var. **pedunculata** (Griff.) Govaerts in R.H.A.Govaerts & J.Dransfield, World Checklist Palms 171. 2005. *Phoenix pedunculata* Griff., Palms Brit. E. Ind. 139. 1850. *Phoenix humilis* Royle ex Becc. var. *pedunculata* (Griff.) Becc., J. Bot. Malesia 3: 379, 387, t. 44. ff. 13-15, 18-21. 1890; Hook. f., Fl. Brit. India 6: 427. 1892; Gamble, Fl. Pres. Madras 1560(1088). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 490. 1988; . *Phoenix humilis* Becc. var. *typica* Becc., J. Bot. Malesia 3:379, 380, t. 44, 2. f. 22-24. 1890. *Phoenix robusta* Becc. in Hook. f., Fl. Brit. India 6: 427. 1892; Gamble, Fl. Pres. Madras 1559(1088). 1931.

Shrub, trunk to 1 m tall. Leaves to 1.5 m long; leaflets linear-lanceolate, to 25 x 1.5 cm, lower ones modified into long spines. Male spadix to 40 cm long, branches crowded towards the apex of peduncle. Female spadix to 1 m long. Fruit oblong, orange-yellow, 1.2 x 0.7 cm.

Ambalappara, NS & KJD 25505

Fl. & Fr.: January-October

Distribution: Common in Grasslands of Ambalappara.

PINANGA Blume, Rumphia 2: 76. 1839.

Pinanga dicksonii (Roxb.) Blume, Rumph. 2: 85. 1838; Hook. f., Fl. Brit. India 6:409.1892; Gamble, Fl. Pres. Madras 1556(1086). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 491. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 899. 2009. *Areca dicksonii* Roxb., Fl. Ind. 3: 616. 1832.

Slender clustered palms, 4-6 m high, 6-8 cm diam. Leaves pinnate, 1-1.3 cm long; leaflets 2-3 united, 30-50 cm long, 2-3 cm wide, toothed margins. Spadix small, at axil below the crown, 4-6 branched, deflexed and drooping. Spathe 1. Flowers unisexual, 3 at a node, middle female and side ones male. Male: Sepals keeled. Petals valvate, 0.2-0.3 cm, ovate lanceolate. Stamens 6. Female: sepals and petals orbicular, 0.1 cm; staminodes 6. Ovary 1-celled; ovule 1. Fruit 0.6-1 x 0.2-0.3 cm, ellipsoid; seed solitary, ellipsoid.

Kattikkari, *KJD 31880*

Fl. & Fr.: November-April

Distribution: Common in Evergreen forests of Kattikkari. Endemic to Western Ghats.

PANDANACEAE

PANDANUS Park., J. Voyage South Seas 46. 1773.

Pandanus odorifer (Forssk.) Kuntze, Rev. Gen. Pl. 2: 737. 1891. *Keura odorifera* Forssk., Fl. Aegypt.-Arab. 172. 1775. *Pandanus odoratissimus* L.f., Suppl. Pl. 424. 1782; Manilal & Sivar., Fl. Calicut 301. 1982; Ansari, Fl. Kasaragod Div. 399. 1985. *Pandanus fascicularis* Lam., Encycl. 1: 372. 1783; Hook. f., Fl. Brit. India 6: 485. 1893.

Branched shrubs or small trees; trunk greyish-brown, ringed by leaf-scars and with basal prop roots. Leaves spiralled in 3 rows, up to 200 cm long and 6 cm broad, linear-ensiform, apex gradually narrowed into an elongated triquete flagella, the margins and dorsal midrib armed with white prickles, glaucous beneath. Female inflorescence a solitary terminal cephalium, pendulous in fruit. Phalanges mostly 5-15-celled, the carpels concentrically arranged, their apices with U-or V-shaped stigmas. Male inflorescence of several spikes, with white or cream axillant bracts, 5-10 cm long, composed of numerous phalanges; anthers apiculate. Fruit c. 20 x 10 cm oblong, red-orange.

Narikkadavu, *KJD 26269*

Fl. & Fr.: July-November

Distribution: Occasional in Semi-evergreen forests of Narikkadavu near river sides.

ARACEAE

- 1a. Climbers 2
- 1b. Erect herbs or shrubs 3
- 2a. Flowers unisexual; leaves pinnate..... Raphidophora
- 2b. Flowers biosexuals; leaves entire Pothos
- 3a. Leaves peltate 4
- 3b. Leaves not peltate 6
- 4a. Leaves cordate at base, ovate..... 5
- 4b. Leaves not cordate at base, orbicular Ariopsis

- 5a. Plants leafless during flowering, mostly epiphytic or on rocks Remusatia
 5b. Flowers produce on leafy plant, not epiphytic Colocasia
 6a. Leaves entire 7
 6b. Leaves divided or deeply lobed 8
 7a. Leaves grass like; spadix spiral Cryptocoryne
 7b. Leaves broad; spadix normal Lagenandra
 8a. Flowers bisexual Anaphyllum
 8b. Inflorescence produced on leafy shoots Arisaema
 8b. Inflorescence produced from corm before leaf appears..... Amorphallus

AMORPHOPHALLUS Blume ex Decne. *nom. cons*

- 1a. Corms cylindric-oblong.....*A. nicolsonianus*
 1b. Corms depressed globose*A. commutatus*

Amorphophallus commutatus (Schott) Engl. in A. & C. DC., Monogr. Phan. 2: 319. 1879, **var. commutatus**; Hook. f., Fl. Brit. India 6: 515. 1893; Sivad. in Manoharan et al., Silent Valley-Whispers Reason 228. 1999; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 901. 2009. *Conophalus commutatus* Schott, Bonplandia 7: 28. 1859 & Prodr. Syst. Aroid. 128. 1860. *Amorphophallus commutatus* (Schott) Engl. var. *wayanadensis* Sivad. & Jaleel, Rheedeia 12: 163. 2002.

Herbs with corms. Leaves tripartitely compound, to 50 m long, leaflets elliptic, caudate-acuminate, base acute, glabrous, membranous; petiole to 50 cm long, terete; peduncle 8-10 cm long and 0.7-0.9 cm diameter, smooth, pale yellowish in colour, covered by about 4 cataphylls, each cataphyll 2.5-15 cm long and 1.5-5.0 cm broad. Spathe ovate-acute, 17-18 cm long and 4-5 cm broad, differentiated into a basal tube and an upper limb separated by a slight constriction between the two; basal tube slightly compressed, obovoid, ca. 2.5-3 cm long; limb expanded, erect, pale yellowish outside and pale brownish towards the margins; tube slightly purplish, verrucose, with unicellular hairs within. Spadix 23-25 cm long, sessile or stipitate to ca. 3-5 mm; female zone ca. 1.5 cm long, male zone cylindrical, ca. 3 cm long, appendix elongate, narrowly conical with rounded apex, 18-20 cm long, 1.3-1.5 cm diameter at base and tapering towards the tip, pale-yellowish brown to dark purplish brown in colour. Female flowers ca. 2.5 mm long, ovary sub-globose, ca. 1.5 mm high, 2 mm diameter, pale greenish, unilocular with a basal anatropous ovule; style very short; stigma ca. 1.5 mm diameter, narrower than the ovary, inconspicuously 3-lobed. Male flowers pale yellowish, densely arranged, sessile; each ca. 1.25 mm high and 1.25 mm broad, inconspicuously 2-lobed; dehiscence by apical slit-like pores.

Kattikkari, *KJD 25561*

Fl. & Fr.: February-September

Distribution: Rare in Evergreen forests of Kattikkari. Endemic to Western Ghats.

Amorphophallus nicolsonianus Sivad., Pl. Syst. Evol. 153: 165. 1986; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 902. 2009.

Corm oblong or subcylindrical. Leaves to 30 cm long; leaflets ovate or oblong, acuminate, base acute or obtuse, glabrous, glossy above, to 15 x 5 cm; subsessile or shortly petiol-ulate. Peduncle terete, to 20 cm long, spathe ovate-lanceolate, acuminate, to 10 x 3 cm, greenish-brown, basally convolute;

spadix sessile, slightly longer than the spathe, flowers confined towards the base 1/3 portion; sterile appendix narrowly cylindrical, tapering to the apex.

Kattikkari, *KJD 25543*

Fl. & Fr.: January-March

Distribution: Rare in Evergreen forests of Kattikkari. Endemic to southern Western Ghats of Kerala.

ANAPHYLLUM Schott, Gen. Aroid. t. 83. 1858.

Anaphyllum wightii Schott, Gen. Aroid. t. 83. 1858; Hook. f., Fl. Brit. India 6: 551. 1893; Gamble, Fl. Pres. Madras 1589(1108). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 492. 1988; Sivad. in Manoharan et al., Silent Valley-Whispers Reason 231. 1999; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 903. 2009.

Tall herbs, rhizome creeping. Leaves pinnatisect or pinnatipartite; lobes 3-8 pairs, 20-28 x 5-10 cm, usually narrower, elliptic to oblong, apex acute, sessile or petiolulate; petiole 60-150 cm long, erect, 5-10 cm thick, smooth or transversally rugose, brownish. Spadix 15-30 cm long, 5-8 cm broad; spathe open, deep brown, once or twice twisted; spikes 4.5 cm long, 8-10 mm thick. Flowers bisexual, densely arranged, 3-6 mm across; perianth lobes 4, obovate, truncate; stamens 6, free, filaments broad; ovary 1-celled, ovule solitary, style short, stigma discoid. Fruit a globose achene.

Pothurumi, *KVB 31668*

Fl. & Fr.: January-July

Distribution: Rare in Evergreen forests of Pothurumi, Kattikkari, Chavachi, etc. Endemic to Western Ghats.

ARISAEMA Mart.

- 1a. Leaf one *A. barnesii*
1b. Leaves two *A. tortuosum*

Arisaema barnesii C.E.C. Fisch., Bull. Misc. Inform. Kew 1933: 342. 1933 & Gamble, Fl. Pres. Madras 1891(1308). 1936; Sivad. in Manoharan et al., Silent Valley-Whispers Reason 233. 1999; Mohanan & Sivad., Fl. Agasthyamala 756. 2002.

Herbs, corm 1-2 cm across. Leaflets 6, 10-16 x 3 cm, elliptic-oblong, apex acuminate, base acute, glabrous; petiole 20-45 cm long, smooth, base sheathing; petiolule 1-2 cm long. Peduncle slender, smaller than the petiole; spathe 6-10 cm long, tube 1-1.5 cm broad, purple with white lines, glabrous; limb ovate, finely caudate-acuminate, horizontal, green with white lines. Spadix 6 cm long, straight, narrowed at apex into a short tail.

Ambalappara, *NS & KVB 31343*

Fl. & Fr.: April-May

Distribution: Rare in Evergreen forests of Ambalappara and Mullenppara. Endemic to Southern Western Ghats.

Arisaema tortuosum (Wall.) Schott in Schott & Endl., Melet. Bot. 1: 17. 1832, **var. tortuosum**; Hook. f., Fl. Brit. India 6: 502. 1893; Gamble, Fl. Pres. Madras 1584(1105). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 493. 1988; 755; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 905. 2009. *Arum tortuosum* Wall., Pl. Asiat. Rar. 2: 10, t. 114. 1830.

Herbs, corms 2-3 cm across. Leaflets 8-10, 8-12 x 3-4 cm, oblanceolate, apex abruptly acuminate, base acute, sparsely hispid below, petiolulate; petiole to 35 cm long, 2-together. Peduncle usually shorter than the petiole; spathe 8-12 cm long, green; limb ovate, acuminate, with white and purple

streaks; tube 4-6 cm long. Spadix 12-18 cm long, sigmoidally curved, appendage narrow.

Ambalappara, *KJD 26146*

Fl. & Fr.: May-June

Distribution: Rare in Grasslands of Ambalappara.

ARIOPSIS Nimmo ex Graham, Cat. Pl. Bombay 252.1839.

Ariopsis peltata Nimmo ex Graham, Cat. Pl. Bombay 252. 1839; Hook. f., Fl. Brit. India 6: 519. 1893; Gamble, Fl. Pres. Madras 1580(1102). 1931; Manilal & Sivar., Fl. Calicut 304. 1982; Ansari, Fl. Kasaragod Div. 401. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 903. 2009.

Epiphytic or terrestrial annual herbs; rootstock globose, to 1 cm across. Leaves 1 or 2, peltate, lamina 5-9 cm across, orbicular, entire, membranous, glabrous; petiole to 8 cm long, slender. Peduncle 2-5 cm long, solitary; spathe yellow or white, 3 cm long, cymbiform, open, tube absent; spike 2.5 cm long, cylindrical, 3 mm, thick. Female flowers 5-7, on one side of the spike towards the lower part; ovary ovoid, 1-celled, ovules many, on parietal placentas; stigma 4-lobed. Male flowers sunken in upper fleshy part of spadix; stamens 3; anthers divaricate, pubescent.

Kariyenkappu, *KJD 26172*

Fl. & Fr.: June-August

Distribution: Fairly common in Plantations of Kariyenkappu, mostly on wet rocks and in Evergreen forests.

COLOCASIA Schott in Scott & Endlicher Melet. Bot. 18. 1832, *nom. cons.*

Colocasia esculenta (L.) Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; Manilal & Sivar., Fl. Calicut 304. 1982; Ansari, Fl. Kasaragod Div. 402. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 493. 1988; Joseph, Aquatic Angiosp. Malabar 294. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 906. 2009. *Arum esculentum* L., Sp. Pl. 965. 1753. *Arum colocasia* L., Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; Hook. f., Fl. Brit. India 6: 523. 1893; Gamble, Fl. Pres. Madras 1580(1102). 1931.

Herbs, rhizome stoloniferous. Leaves few to many, peltate, 20-28 x 10-18 cm, ovate, cordate to sagittate at base, glabrous; nerves 6 pairs, united to form an intramarginal vein; lowest pair with lateral nerves of the basal lobes, intercostae curved; petiole 30-45 cm long, cylindrical, smooth. Peduncle solitary or few together, 10-20 cm long, stout; spathe to 20 cm long, yellow, lanceolate, constricted above the base; limb acuminate. Spadix 10 cm long, cylindrical, appendages terete, obtuse. Male flowers above, to 5-6 cm of the spadix, stamens 6; female flowers on lower, 2 cm of the spadix; ovary 1-celled, ovules many on 2-4 parietal placentas. Neutral flowers many, peltate, between the female and male flowers. Fruit an aggregate of berries, globose.

Kariyenkappu, *KJD 26145*

Fl. & Fr.: May-October

Distribution: Common in water-logged areas.

CRYPTOCORYNE Fischer ex Wydler, Linnaea 5: 428. 1830.

Cryptocoryne retrospiralis (Roxb.) Kunth, Enum. Pl. 3: 12. 1841; Hook. f., Fl. Brit. India 6: 493. 1893; Gamble, Fl. Pres. Madras 1575(1098). 1931; Ansari, Fl. Kasaragod Div. 403. 1985; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 906. 2009. *Ambrosinia retrospiralis* Roxb., Fl. Ind. 3: 492. 1832. *Cryptocoryne dalzellii* Schott, Bonplandia 5: 221. 1857. *Cryptocoryne roxburghii* Schott, Prodr. Syst.

Aroid. 18. 1860; Hook. f., Fl. Brit. India 6: 494. 1893.

Stoloniferous marshy herbs. Leaves many, to 16 x 0.8 cm, linear-oblong, acute, glabrous; sheath white, closed. Peduncle 2-3 cm long, slender, solitary; spathe 10-12 cm long, partitioned by a transverse diaphragm above the spadix; tube above the diaphragm 6 cm long, limb 3 cm long, spirally twisted, acuminate, pale brown with deep brown spots; spadix 14 mm long, included in the chamber, slender at middle. Female flowers 4 or 5, one-whorled at the base; ovaries connate, 1-celled, ovules many, on parietal placentas; style short, curved. Neutral flowers 4-6, above the female flowers as a whorl of appendages. Male flowers many, in terminal globose clusters; stamens 1 or 2.

Kariyenkappu, *KJD 26148*

Fl. & Fr.: November-March

Distribution: Fairly common in Semi-evergreen forests of Narikkadavu, Valayamchal near stream and Plantations of Kariyenkappu.

LAGENANDRA Dalz., Hook.'s J. Bot. Kew Gard. Misc. 4: 289. 1852.

Lagenandra ovata (L.) Thw., Enum. Pl. Zeyl. 334. 1864; Gamble, Fl. Pres. Madras 1576(1099). 1931; Ansari, Fl. Kasaragod Div. 403. 1985; Joseph, Aquatic Angiosp. Malabar 291. 1991. *Arum ovatum* L., Sp. Pl. 967. 1753. *Lagenandra insignis* Trimen, J. Bot. 23: 269. 1885; Hook. f., Fl. Brit. India 6: 496. 1893.

Perennial herbs; rhizome creeping, 4 cm thick, usually in mud, cylindrical. Leaves entire, to 40 x 13 cm, ovate-oblong, acute, at both ends; nerves many, erose; petiole 30-70 cm long. Peduncle axillary, erect, 15-20 cm long; spathe 15-20 x 5-10 cm, broadly ellipsoid, closed, coarsely warted on both surface, deep brown, twisted and acuminate at apex; spadix 3-5 cm long, included in the chamber. Male flowers many, in terminal globose head; stamens 1 or 2; female flowers many, basal, subglobose; ovary obovoid; ovule 1. Fruitlets obovoid, ridged; seed 1, brown.

Kariyenkappu, *KJD 26149*

Fl. & Fr.: June-February

Distribution: Common along stream sides in the Plantations of Kariyenkappu and Evergreen forests of Kattikkari.

POTHOS L., Sp. Pl. 968. 1753.

Pothos scandens L., Sp. Pl. 968. 1753; Hook. f., Fl. Brit. India 6: 551. 1893; Gamble, Fl. Pres. Madras 1592(1110). 1931; Manilal & Sivar., Fl. Calicut 302. 1982; Ansari, Fl. Kasaragod Div. 404. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 494. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 909. 2009.

Climbers, stem angled, rooting at nodes. Leaves 5-9 x 2-3 cm, lanceolate, apex acuminate, nerves many, united to form 2-3 narrow ribs, glabrous; petiole 3-6 cm long, broadly winged, wing broaden above. Inflorescence axillary; peduncle to 0.5 cm long; spathe 5 mm across, orbicular, obtuse, concave, brown; spadix 3-5 mm across, globose. Flowers densely packed; bracts 3-5, orbicular; stamens 6, free; ovary obovoid, stigma 3-toothed. Berry oblong, 1-1.8 cm long.

Kariyenkappu, *KVB 31521*

Fl. & Fr.: October-November

Distribution: Common at Plantations of Kariyenkappu and Evergreen forests of Chavchi.

RAPHIDOPHORA Hassk., Flora 25(2) Beibl. 1: 11. 1842.

Rhaphidophora pertusa (Roxb.) Schott, Bonplandia 5: 45. 1857; Hook. f., Fl. Brit. India 6: 546. 1893; Gamble, Fl. Pres. Madras 1598(1109). 1931; Manilal & Sivar.,

Fl. Calicut 302. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 494. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 910. 2009. *Pothos pertusa* Roxb., Fl. Ind. 1: 455. 1820. *Monstera pertusa* (Roxb.) Schott, Wiener Z. Kunst. 1830: 781. 1830. *Scindapsus pertusus* (Roxb.) Schott in Schott & Endl., Melet. Bot. 21. 1832.

Stout perennial climbers, stem cylindrical, 3-4 cm thick, fleshy. Leaves 25-35 x 25-30 cm, broadly ovate, pinnatisect or rarely entire, apex acute, base rounded; petiole 20-35 cm long, channelled. Inflorescence solitary, axillary; spathe to 20 x 8 cm long, ovate-oblong, concave, acute, creamy white; spadix 12 cm long, 2 cm thick. Flowers unisexual, densely packed. Female flowers basal; ovary obconical, truncate, 1-celled; ovule solitary; stigma knob-like. Male flowers above; stamens 4-6, free.

Chavachi, KVB 31291

Fl. & Fr.: August-September

Distribution: Fairly common in Evergreen forests of Chavachi.

REMUSATIA Hassk., in Schott & Endlicher, Melet. Bot. 18. 1832.

Remusatia vivipara (Roxb.) Schott in Schott & Endl., Melet. Bot. 18.1832; Hook. f., Fl. Brit. India 6:521.1893; Gamble, Fl. Pres. Madras 1583(1104). 1931; Ansari, Fl. Kasaragod Div. 405. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 495. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 909. 2009. *Arum viviparum* Roxb., Hort. Bengal 65. 1814.

Epiphytic or lithophytic herbs with erect bulbiferous slender shoots. Leaves 20-30 cm across, ovate, apex acute, base cordate, glossy above; nerves prominent; petiole to 40 cm long. Inflorescence solitary, on erect, terminal peduncle, covered with large cataphylls; spathes obovate to rhomboid, spreading, yellowish white; tube short, 5 cm long, ellipsoid, limb to 10 x 7 cm, acute; spadix 5 cm long. Female flowers many, ovary globose, 1-celled; ovules many, parietal, stigma 3-lobed, globose. Male flowers many, on clavate above part of the spadix; stamens 6, united.

Kattikkari, NS & KVB 31336

Fl. & Fr.: February-April

Distribution: Rare in Evergreen forests at Kattikkari, Mullenpara and Chahurumala.

NAJADACEAE

NAJAS L., Sp. Pl. 1015. 1753.

Najas graminea Del., Descr. Egypte Hist. Nat. 2: 282, t. 50. 1813; Gamble, Fl. Pres. Madras 1604(1118). 1931; Manilal & Sivar., Fl. Calicut 307. 1982; Joseph, Aquatic Angiosp. Malabar 448. 1991.

Herbs, plants monoecious. Stems to 25 cm long, sparingly branched; internodes to 1.5 cm long. Leaves whorled, 1.2 x 0.2 cm, acicular, translucent, margins with 50-70 spiny teeth; sheaths 3-4.5 mm long, with 5-10 spines on the margins; auricles to 2 mm long, narrowly lanceolate, apex acute. Flowers 1-2 per axil, male flowers in the upper axils, female flowers through out. Male flowers: spathe absent, pedicelled; perianth-lobes 1.5-2 mm long, globose-oblong, hyaline; anthers 4-celled, c. 1.5 mm long, elliptic. Female flowers: spathe absent, subsessile, to 3 mm long; perianth-lobe closely appressed to ovary; ovary c. 2 mm long, elliptic; stigma c. 1 mm long. Fruit to 2 x 1 mm, subterete or ellipsoid; seeds small.

Kariyenkappu, NS & KVB 31374

Fl. & Fr.: August-September

Distribution: Rare in ponds.

ERIOCAULACEAE

ERIOCAULON L., Sp. Pl. 87. 1753.

- 1a. Heads 2 cm across; leaves 2 cm broad *E. robusto-brownianum*
1b. Heads less than 1 cm across 2
2a. Seed coat ornamented *E. thwaitesii*
2b. Seed coat not ornamented 3
3a. Heads per plant 1 or 2 (3) *E. pectinatum*
3b. Heads per plant more than 3 *E. talbotii*

Eriocaulon pectinatum Ruhland in Engl., Pflanzenreich Eriocaul. 85. 1903; Gamble, Fl. Pres. Madras 1620(1127). 1931; R. Ansari & N.P. Balakr., Eriocaul. India (Rev.) 139. 2009. *Eriocaulon geoffreyi* Fyson, Bull. Misc. Inform. Kew 1914: 330. 1914.

Leaves 2-3.5 x 0.15 cm, linear, acuminate, glabrous. Peduncles 1-3, 12 cm long; sheath 2 cm long, limb minute. Head globose; involucre bracts obovate, acute, glabrous, black; floral bracts 2.5 x 1 mm, deltoid, acute, hairy towards the apex, black. Female sepals 2 x 0.5 mm, densely hairy at apex, black; petals oblanceolate, hairy at apex, glandular; seeds ovoid; epidermal cells transversely elongate. Male sepals united into a split sheath, densely hairy at apex, truncate, black; petals hairy, one slightly larger, glandulose; anthers black. Seeds not ornamented

Ambalappara, KJD 31973

Fl. & Fr.: October-December

Distribution: Fairly common in open areas of Evergreen forests at Ambalappara.

Eriocaulon robustobrownianum Ruhland in Engl., Pflanzenreich Eriocaul. 77. 1903; Gamble, Fl. Pres. Madras 1619(1127). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 497. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 918. 2009; R. Ansari & N.P. Balakr., Eriocaul. India (Rev.) 18. 2009. *Eriocaulon mysorensense* Fyson, Bull. Misc. Inform. Kew 1914: 331. 1914.

Acaulescent herbs; rootstock absent. Leaves rosulate, oblong-ensiform, obtuse, up to 30 x 1.6 cm, glabrous. Peduncles many, rigid, up to 45 cm long, glabrous; sheaths up to 15 cm long, glabrous; limb lanceolate, acuminate, entire; heads ca 1 cm across; receptacles flat, villous; involucre bracts reflexed, obovate, obtuse, ca 2.75 x 2.5 mm, chartaceous, glabrous, straw-coloured; floral bracts oblanceolate, acuminate, ca 3.75 x 1 mm, hyaline, hoary dorsally towards tip, black. Male flowers: pedicels ca 0.5 mm long; sepals obovate-cuneate, connate into a spathe of ca 1.75 x 1.5 mm, 3-lobed at apex with truncate lobes, hoary at apex, black; stipe of corolla ca 1.25 mm long; petals 3, similar, oblong, hoary, with a black gland; anthers 6, oblong, black. Female flowers: pedicels ca 0.75 mm long; sepals 3, free, subsimilar, oblanceolate, ca 2.25 mm long; the lateral ones conduplicate, minutely keeled; the middle one flat, not keeled, acute, hoary dorsally towards tip black; petals 3, subequal, elliptic, not clawed, acute, ca 2 mm long, pilose, with a black gland; stipe between sepals and petals short; ovary subsessile, ovoid-globose, style 3-fid. Seeds oblong-ellipsoid, obtuse, ca 0.6 x 0.45 mm, dark purple; cells of seed coat transversely elongated, aligned in vertical rows; appendages solitary from the centre of each transverse radial wall, elongated, curved and connate with the adjacent ones of the same vertical row forming longitudinal parallel ribs on the surface of seeds.

Fl. & Fr.: January-March

Distribution: Common in Evergreen forests of Ambalappara. Endemic to Peninsular India.

Eriocaulon talbotii R. Ansari & N.P. Balakr., *Eriocaul.* India 172. 1994 & *Eriocaul.* India (Rev.) 163. 2009. *Eriocaulon horsleykunda* Fyson var. *megalocephala* Fyson, *J. Indian Bot. Soc.* 3: 14. 1922.

Acaulescent herbs. Leaves to 6 x 0.5 cm, linear-ensiform, apex acuminate. Peduncles to 25 cm, virgate, sheath to 4 cm, limb incised. Head 1-1.3 cm across, spherical, grey; involucral bracts 2 mm across, ovate, obtuse; floral bracts ca 3 x 1 mm, oblanceolate, acute, apex hoary; male sepals 2 mm across, obovate, connate, apex hoary; petals ca 2 mm across, spatulate, obtuse, free; ovary sessile, globose, style trifid. Seed globose, purple, seed coat aligned in vertical rows.

Ambalappara, KJD 25571; NS & KJD 25530

Fl. & Fr.: August-March

Distribution: Comm in the Evergreen forests of Ambalappara. Endemic to Western Ghats.

Eriocaulon thwaitesii Koernicke, *Linnaea* 27: 627. 1854; Hook. f., *Fl. Brit. India* 583. 1893; Gamble, *Fl. Pres. Madras* 1620(1128). 1931; R. Ansari & N.P. Balakr., *Eriocaul.* India (Rev.) 60. 2009. *Eriocaulon mariae* Fyson, *Bull. Misc. Inform. Kew* 1914: 331. 1914. *Eriocaulon gamblei* C.E.C. Fisch., *Bull. Misc. Inform. Kew* 1930: 160. 1930 & in Gamble, *Fl. Pres. Madras* 1618(1128). 1931.

Acaulescent herbs. Leaves 6-8 x 0.5 cm, lanceolate, acuminate, glabrous. Peduncles several to many, 10-30 cm long; heads 2.5-4 x 4-6 mm, globose; receptacle pilose, involucral bracts 2 x 1.5 mm, oblong, rounded to truncate at apex, straw-coloured; floral bracts 2 x 1 mm, cuneate, acute, hairy at apex, brown. Female sepals 2, lanceolate, keeled, brown; petals linear, hyaline; seed walls in vertical row. Male sepals 2, united at the base, glabrous, brownish; petals equal, hairy, glandulose.

Ambalappara, KVB 31640; NS & KJD 25531

Fl. & Fr.: July-September

Distribution: Common in Evergreen forests and Grasslands of Ambalappara.

CYPERACEAE

- 1a. Florets unisexual 2
- 1b. Florets bisexual..... 4
- 2a. Nut enclosed in utricle *Carex*
- 2b. Nut not enclosed in utricle 3
- 3a. Disc present below the nut *Scleria*
- 3b. Disc absent below the nut *Hypolytrum*
- 4a. Hypogynous bristles present..... *Schoenoplectus*
- 4b. Hypogynous bristles absent..... 5
- 5a. Style base dilated and constricted above the nut *Fimbristylis*
- 5b. Style base continuous with nut 6
- 6a. Rachilla persistent 7
- 6b. Rachilla deciduous..... 8
- 7a. Nut trigonous, stigmas 3 *Cyperus* p.p
- 7b. Nut biconvex, stigmas 2 *Pycreus*

- 8a. Keels of nut bearing glumes usually winged *Kyllingia*
 8b. Keels of nut bearing glumes not winged or serrulate *Cyperus* p.p.

CAREX L., Gen. Pl. ed. 1, 280. 1737.

- 1a. Inflorescence paniculate *C. filicina*
 1b. Inflorescence spicate 2
 2a. Utricles distinctly beaked 3
 2b. Utricles not or very shortly beaked *C. phacota*
 3a. Spikelets androgynous *C. leucantha*
 3b. Spikelets unisexual *C. breviculmis*

Carex breviculmis R. Br., Prodr. 242. 1810; Hook. f., Fl. Brit. India 6: 746. 1893; Gamble, Fl. Pres. Madras 1686(1168). 1931; Rejani, Cyperac. Kerala 93. 1991.

Erect, tufted, rhizomatous perennials, 30-40 cm tall; rhizome short, woody; stem trigonous, smooth. Leaves basal and sub basal, exceeding the stem, 2-4 mm wide, scabrid on margins and keel; sheaths light brown, 3-8 cm long. Inflorescence simple, erect, with 3-7 spikelets, terminal one male, lateral ones female, sessile or sometime shortly peduncled; lower bract exceeding the inflorescence, upper reduced. Male spikelet linear, 10-20 x 2-3 mm; female spikelet cylindrical, 5-15 x 3-4 mm; glumes ovate-acute, 2.5-3 x 1.5 mm, 3 nerved in the centre, midrib excurrent into a scabrid awn, brown with white hyaline margins. Style base thickened, persistent; stigmas 3. Utricle ellipsoid, trigonous, several nerved, hispidulous, 2.5-3.5 x 1 mm, light brown, subabruptly beaked; nut triquetrous, ellipsoid, 1.5-2 x 1 mm, apiculate, mitrate.

Ambalappara, *KJD 26245*

Fl. & Fr.: December-January

Distribution: Fairly common in Evergreen forests of Ambalappara.

Carex filicina Nees in Wight, Contrib. 123. 1834; Hook. f., Fl. Brit. India 6: 717. 1894; Gamble, Fl. Pres. Madras 1686(1169). 1931; Ramach. & V.J. Nair, Fl. Cannanore Dist. 500. 1988; Rejani, Cyperac. Kerala 106. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 921. 2009. *Carex glaucina* Boeck., Linnaea 40: 353. 1876; Rejani, Cyperac. Kerala 109. 1991; Ramach. & V.J. Nair, Fl. Cannanore Dist. 500. 1988. *Carex leptocarpa* Clarke in Hook. f., Fl. Brit. India 6: 719. 1893. *Carex filicina* Nees var. *leptocarpa* (Clarke) Kukenth. in Engl., Pflanzenr. 4, Fam. 20: 274. 1909.

Perennial herbs, culms to 120 cm tall, slender. Leaves 30-60 x 0.8 cm, scabrous. Sheath rounded, closed. Partial panicles 8-10 x 3 cm; bracts to 30 cm long; bracteoles filiform. Spikelets 1.5 cm long; male portion 3-4 mm long, narrower; pistillate glumes 2 mm long, reddish brown. Utricle 3.5 mm long, scabrid, blotched with red spots; beak 1.5 mm long, deeply bifid. Staminate glumes 3 x 1.5 mm, acute.

Ambalappara, *NS & KJD 26139*

Fl. & Fr.: May-August

Distribution: Fairly common in Evergreen forests of Ambalappara.

Carex leucantha Arn. ex Boott, Trans. Linn. Soc. London 20: 135. 1846; Hook. f., Fl. Brit. India 6: 721. 1894; Gamble, Fl. Pres. Madras 1686(1168). 1931.

Herbs, culms 30-50 cm high, loosely tufted, triquetrous. Leaves 30-50 x 0.8-1 cm, flat; sheath 3-angled, closed, 6-7 cm long. Partial panicles distant, long-peduncled; branches scabrid. Spikelets 1-1.5 cm long; male and female parts equal; pistillate glumes 2 x 1.5 mm, oblong, emarginate; cusp 3-4 mm long, scabrid; utricle 4-5 mm long, beaked. Utricle 2.2 x 1.2 mm, pale brown. Staminate glume 4 x 1 mm, obtuse; anthers 1.5 mm long.

Ambalappara, NS & KJD 25488, 25469

Fl. & Fr.: August-April

Distribution: Fairly common in Evergreen forests of Ambalappara.

Carex phacota Spreng., Syst. Veg. 3: 826. 1826; Hook. f., Fl. Brit. India 6: 708. 1894; Gamble, Fl. Pres. Madras 1686(1169). 1931; Rejani, Cyperac. Kerala 101. 1991.

Perennial herbs, culms 50-70 cm tall, triquetrous. Leaves cauline, 20-80 x 0.3-1 cm, linear, 3-costate; sheath keeled, open. Spikelets 5-7 in a terminal raceme, cylindrical; terminal one fully or partly male, others female, 5 cm long, 5 mm wide; pistillate glumes 2 x 1 mm, obovate, truncate at apex, aristate, blotched with red spots, hirtus. Utricle 3 x 1.5 mm, puberulus, deep brown. Staminate glumes 3 x 1.5 mm, obovate, emarginate, aristate; stamens 3;

Kannadivechakunnu, NS & KJD 2553; Ambalappara, KVB 31661

Fl. & Fr.: October-April

Distribution: Common in Evergreen forests and Grasslands.

CYPERUS L., Sp. Pl. ed. 1, 1: 44. 1753.

- 1a. Rhachilla deciduous 2
- 1b. Rhachilla persistent 4
- 2a. Glumes with arista *C. maderaspatanus*
- 2b. Glumes without arista 4
- 3a. Inflorescens head *C. dubius*
- 3b. Inflorescens umbel *C. cyperinus*
- 4a. Spikelets digitately arranged or inflorescence capitates 5
- 4b. Spikelets spicately arranged on an elongated rhachis 6
- 5a. Stolons absent, large perennial herb *C. diffusus*
- 5b. Stolons present, small annual herb *C. tenuispica*
- 6a. Glumes not mucronate 7
- 6b. Glumes mucronate *C. sphacelatus*
- 7a. Margin of glumes not hyaline *C. distans*
- 7b. Margin of glumes hyaline *C. bulbosus*

Cyperus bulbosus Vahl, Enum. Pl. 2: 342. 1805; Hook. f., Fl. Brit. India 6: 611. 1893; Gamble, Fl. Pres. Madras 1641(1140). 1931; Manilal & Sivar., Fl. Calicut 316. 1982; Rejani, Cyperac. Kerala 145. 1991; Joseph, Aquatic Angiosp. Malabar 312. 1991.

Perennial herbs, 10-30 cm high, often forming small tufts; stolons thin; stem 0.5-1.5 mm diam., sharply trigonous, smooth; base swollen, often with remains of bulbil, emitting stolons 0.5 mm diam. ending into a bulbil, 8-12 mm, with dark black-brown scales. Leaves numerous, shorter to much longer than the stem; sheaths to 80 mm, yellowish, grey or brownish, soft, mouth margin slightly concave; blades to more than 20 cm, 1.5-3 mm wide, keeled, revolute, often curved, green or greyish-green, margins smooth, apex trigonous or flat, long attenuate, acute, scabrous. Inflorescence a much reduced anthelodium or multiple spike, 3-9 cm, primary branches few and short, each ending with compact cluster of 3-10 spirally arranged spikes, or basal part

often two spikes close together and supported by thin foliose bract longer than the spike; at base of branches tubular prophyll up to 7 mm; bracts up to 12 cm, several foliose, thin, clearly spaced. Spike 12-15 x 1.5 mm, slightly compressed, brown; rachis winged; glumes c. 3 mm, cymbiform, back rounded, mid-nerve reddish-brown and ending into mucro just above the rounded glume tip, sides with 3-4 prominent nerves, margins scarious. Nut 1.3-1.5 x c. 0.7 mm, trigonous, plano-convex, obovoid, grey and finely reticulate.

Narikkadavu, NS & KVB 26235

Fl. & Fr.: September-May

Distribution: Common along the sides of Cheenkannipuzha.

Cyperus cyperinus (Retz.) Sur., Cyp. Mal. Arch. 154. t.6. f.10. 1898; Ansari, Fl. Kasaragod Div. 418. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 504. 1988; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 923. 2009. *Kyllinga cyperina* Retz., Obs. Bot. 6: 21. 1791. *Mariscus cyperinus* (Retz.) Vahl, Enum. Pl. 2: 377. 1805; Hook. f., Fl. Brit. India 6: 621. 1893; Gamble, Fl. Pres. Madras 1644(1143). 1931; Manilal & Sivar., Fl. Calicut 312. 1982; Rejani, Cyperac. Kerala 354. 1991. *Mariscus pictus* Nees in Wight, Contrib. 90. 1834; Hook. f., Fl. Brit. India 6:621.1893; Gamble, Fl. Pres. Madras 1645(1143). 1931. *Mariscus cyperinus* (Retz.) Vahl var. *pictus* (Nees) Karthik, Fl. Ind. Enum. 63. 1989; Sasidh., Fl. Chinnar WLS 332. 1999.

Erect, tufted perennials with short rhizome; culms 10-30 cm tall, triquetrous, smooth. Leaves many, basal, 5-20 x 0.2-0.5 cm, linear, long-acuminate, scabrid on margins; sheaths upto 4 cm long, basal reddish-brown. Inflorescence simple 1-1.5 x 1.5-2 cm, branches spicate, spike nearly capitate, subsessile; leafy bracts 4-7, the longest upto 15 cm long. Spikelets 3-5 x 1-1.5 mm, linear-lanceolate, subterete, greenish-straw coloured. Glumes distichous, 3-4 x 1.5-2 mm, elliptic, obtuse, muticous, inrolled. Stamens 3; anthers linear. Stigmas 3. Nuts 2-2.5 x 0.5-1 mm, oblong, trigonous, shortly apiculate, brown, slightly curved, minutely punctulate.

Ambalappara, NS & KVB 26225

Fl. & Fr.: May-August

Distribution: Common in all vegetation types.

Cyperus diffusus Vahl, Enum. Pl. 2: 321. 1805; Hook. f., Fl. Brit. India 6: 603. 1894; Gamble, Fl. Pres. Madras 1639(1139). 1931; Koyama in Dassan. & Fosb., Rev. Handb. Fl. Ceylon 5: 197. 1985; Rejani, Cyperac. Kerala 157. 1991. *Cyperus pubisquama* Steud., Syn. Pl. Glum. 2: 20. 1855; Hook. f., Fl. Brit. India 6: 604. 1893; Gamble, Fl. Pres. Madras 1639(1139). 1931; Vajr., Fl. Palghat Dist. 547. 1990. *Cyperus diffusus* Vahl ssp. *macrostachyus* (Boeck.) Koyama, Gard. Bull. Singapore 30. 139. 1977 & Rev. Handb. Fl. Ceylon 5: 198. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 505. 1988; Rejani, Cyperac. Kerala 159. 1991.

Erect, single or tufted, perennials; rhizome short, corm-like, covered with brown scales; culms 45-100 cm tall, trigonous, triquetrous below the inflorescence. Leaves several, basal, 35-90 x 0.8-2 cm, linear, abruptly acute at apex, flattish margins scabrous, prominently 3-nerved; sheaths up to 10 cm long, purple-brown. Inflorescence compound to de-compound, 20-35 cm across, diffuse; primary rays many; leafy bracts 5-9, the longest up to 73 cm long and 2 cm wide. Spikelets sessile, 8-12 x 1.5-2 mm, linear-oblong,

flattened, acute, 25-30-flowered. Glumes c. 1.5 x 1 mm, ovate-obtuse, closely imbricating, strongly keeled, keel excurrent into a mucro, margins white-hyaline. Stamens 2-3. Stigmas 3. Nut c. 1.5 x 0.5 mm, ellipsoid, triquetrous, apiculate, dark brown to black.

2nd Crossway, NS & KVB 26202

Fl. & Fr.: November-August

Distribution: Common in places below 1000 m altitude.

Cyperus distans L. f., Suppl. Pl. 103. 1781; Hook. f., Fl. Brit. India 6: 607. 1894; Gamble, Fl. Pres. Madras 1640(1140). 1931; Manilal & Sivar., Fl. Calicut 315. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 505. 1988; Rejani, Cyperac. Kerala 161. 1991; Joseph, Aquatic Angiosp. Malabar 320. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 923. 2009. *Cyperus nutans* sensu Clarke in Hook.f., Fl. Brit. India 6: 607. 1893, p.p., non Vahl 1805. *Cyperus distans* L.f. var. *pseudonutans* Kukenth. in Engler's Das Pflanzenr. Heft 101, 140. 1936; Ansari, Fl. Kasaragod Div. 419. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 506. 1988.

Erect, rhizomatous perennials; rhizome short, knotty; culms solitary or few together, 27-80 cm tall, triquetrous, thickened at base. Leaves few, basal, 8-51 x 0.4-0.7 cm, linear, apex acuminate, scabrid on margins; sheaths 6-15 cm long, purple-brown. Inflorescence compound to de-compound; leafy bracts 4-6, the lowest up to 42 cm long; rays 5-12, very unequal. Spike loose, broadly ovate-pyramidal, distantly bearing 8 to 20 spikelets. Spikelets 0.8-2.2 x 0.1 cm, linear, subterete; rachilla flexuous, winged. Glumes distantly disposed on weakly zig-zag rachilla, 1.5-2 x 1 mm, ovate-oblong, obtuse, margins white-hyaline. Stamens 3; anthers oblong. Stigmas 3. Nut c. 1.5 x 0.5 mm, oblong, trigonous, apiculate, dark brown, minutely punctulate.

Astippara, NS & KJD 26165

Fl. & Fr.: July-November

Distribution: Common in all vegetation types.

Cyperus dubius Rottb., Desc. Nov. Pl. 20. t. 4, f.5. 1773; M. Mohanan & Henry, Fl. Thiruvanthapuram 507. 1994. *Mariscus dubius* (Rottb.) Kukenth. ex C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1644(1142). 1931; Manilal & Sivar., Fl. Calicut 312. 1982; Rejani, Cyperac. Kerala 357. 1991.

Erect, tufted perennials with short rhizome; culms 15-38 cm tall, triquetrous, base bulbous, covered with brown membranous sheaths. Leaves many, basal, 16-30 x 0.2-0.4 cm, linear, gradually acuminate at apex, scabrid on margins towards the apex; sheaths 2-6 cm long, basal ones brown. Inflorescence simple, congested in a dense, hemispherical, ovoid, white, head, 1-2 cm long and wide; leafy bracts 3-5, the longest upto 20 cm long. Spikelets 5-8 x 1.5-2.5 mm, ovate-acute, turgid-flattened. Glumes 4-9, distichous, 2.5-3.5 x 2-3 mm, broadly ovate, apex subacute, whitish. Stamens 3; anthers c. 1.5 mm long, oblong. Stigma 3. Nuts 1.5-2 x 0.5 mm, oblong-ellipsoid, trigonous, light brownish.

Asthipara, NS & KJD 26161

Fl. & Fr.: July-August

Distribution: Rare in Evergreen forests from Asthipara to Mullenpara.

Cyperus maderaspatanus Willd., Sp. Pl. 1: 278. 1798; Ansari, Fl. Kasaragod Div. 421. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 508. 1988;

Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 926. 2009. *Mariscus maderaspatanus* (Willd.) Napper, J. E. Africa Nat. Hist. Soc. 28: 10. 1971; Rejani, Cyperac. Kerala 360. 1991. *Mariscus squarrosus* Clarke in Hook. f., Fl. Brit. India 6: 623. 1893 quoad spec.; Gamble, Fl. Pres. Madras 1645(1143). 1931; Manilal & Sivar., Fl. Calicut 312. 1982; Rejani, Cyperac. Kerala 364. 1991; Joseph, Aquatic Angiosp. Malabar 387. 1991. *Cyperus squarrosus* auct. non L. in Torner, Cent. Pl. 2:6.1756; Ansari, Fl. Kasaragod Div. 424. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 512. 1988. *Cyperus aristatus* Rottb., Desc. Nov. Pl. 22. t. 6, f. 1. 1773; Hook. f., Fl. Brit. India 6: 606. 1893; Gamble, Fl. Pres. Madras 1640(1140). 1931.

Erect tufted, non-rhizomatous annual herbs; culms 5-12 cm tall, triquetrous. Leaves 2-4 to a culm, 1.5-8 x 0.1-0.3 cm, linear, flat, gradually acuminate; sheaths up to 2.5 cm long, reddish-purple. Inflorescence simple, open, or often reduced to a single hemispherical head; rays 1-3; leafy bracts 2-4, the lowest up to 8 cm long; spikes 0.5-1.5 cm across, subglobose. Spikelets 6-12 x 3-4 mm, oblong or linear, compressed. Glumes distichous, 2-2.5 long (including awn), c. 1 mm wide, oblong-ovate, folded, apex narrowed in to a recurved, c. 1 mm long awn, greenish; basal 2 glumes empty. Stamen 1. Stigma 3-fid. Nuts c. 1 x 0.5 mm, oblong-obovate, trigonous, apiculate, brown.

Kariyenkappu, NS & KVB 26220

Fl. & Fr.: November-May

Distribution: Common in all vegetation types below 1000 m.

Cyperus sphacelatus Rottb., Descr. Icon. Rar. Pl. 26. 1773; Sunil & Sivadasan, Fl. Alappuzha Dist. 761. 2009.

Erect annual herbs with brownish roots; culms tufted or solitary, 23-60 cm tall, triquetrous. Leaves few, 5-18 x 0.2-0.4 cm, linear, gradually acuminate, scabrid on upper margins; sheaths 2-7 cm long, pale straw-coloured. Inflorescence simple to compound, 6-17 cm across; primary rays 3-8, unequal, upto 10 cm long; leafy bracts 3-5, the longest upto 20 cm long. Spikelets 8-20 x 1.5-2 mm, linear-lanceolate, acute, flattened, straw-coloured with purple-brown flanks. Glumes 2-2.5 x 1.5-2 mm, elliptic to ovate, subacute, mucronate, straw-coloured with purple-brown stain on both sides of keel, keel greenish. Stamens 3. Style c. 1.5 mm long. Nut 1-1.5 x 0.5-1 mm, obovate, triquetrous with concave sides, brown.

Narikkadavu, NS & KVB 26240

Fl. & Fr.: November-May

Distribution: Fairly common along the sides of Cheenkannipuzha.

Cyperus tenuispica Steud., Syn. Pl. Glum. 2: 11. 1855; Gamble, Fl. Pres. Madras 1640(1139). 1931; Manilal & Sivar., Fl. Calicut 318. 1982; Ansari, Fl. Kasaragod Div. 425. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 512. 1988; Rejani, Cyperac. Kerala 185. 1991; Joseph, Aquatic Angiosp. Malabar 340. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 927. 2009. *Cyperus flavidus* Clarke, J. Linn. Soc. Bot. 21: 22. 1884 & in Hook. f., Fl. Brit. India 6: 600. 1893, non Retz. 1789.

Erect, tufted, non-rhizomatous annual herbs; roots reddish-purple; culms 12-32 cm tall, triquetrous. Leaves few, basal, 5-20 x 0.2-0.3 cm, linear, flat, gradually acuminate, scabrid on upper margins; sheaths up to 5 cm long, reddish-brown. Inflorescence compound to de-compound 5-12 cm long and as wide; leafy bracts 1-3, the longest up to 12 cm long; primary rays 5-12.

Spikelets digitate in clusters of 3-9, 3-7 x 1-1.5 mm, linear-oblong, flattened. Glumes 0.5-1 x 0.5 mm, ovate-oblong, obtuse, mucronate, straw-coloured. Stamens 1 or 2. Stigmas 3. Nut up to 0.5 mm long, obovate, trigonous, white, minutely tuberculate.

Narikkadavu, NS & KVB 26234, 26238

Fl. & Fr.: Throughout the year

Distribution: Common along the sides of Cheenkannipuzha.

FIMBRISTYLIS Vahl, Enum. Pl. 2: 285. 1806, *nom. cons.*

- 1a. Leaves absent *F. salbundia*
- 1b. Leaves present 2
- 2a. Style 2-fid; nut flattened..... 3
- 2a. Style 3-fid; nut trigonous *F. complanata*
- 3a. Spikelets solitary, margins of glumes white or hyaline..... *F. dichotoma*
- 3b. Spikelets clustered, margins of glumes white or hyaline *F. argentea*

Fimbristylis argentea (Rottb.) Vahl, Enum. Pl. 2: 294. 1805; Hook. f., Fl. Brit. India 6: 640. 1893; Gamble, Fl. Pres. Madras 1659(1151). 1931; Manilal & Sivar., Fl. Calicut 325. 1982; Ansari, Fl. Kasaragod Div. 427. 1985; Rejani, Cyperac. Kerala 303. 1991. *Scirpus argenteus* Rottb., Desc. Nov. Pl. 51. t. 17, f. 6. 1773.

Annuals, 5-10 cm tall; culms tufted, compressed, trigonous, glabrous. Leaves basal, 3-10 x 0.1 cm, linear, flat, margins involute; sheaths 5-12 mm long, laterally compressed, straw-coloured, lower ones bladeless, mouth oblique, membranous with dark brown spots; ligule absent. Inflorescence terminal, capitate, 1-2 cm across; bracts 2-3, the largest to 4 cm long. Spikelets 5-8 x 1-1.5 mm, oblong-cylindric, obtuse, brown; rachilla narrowly winged. Glumes spiral, 1-1.5 mm long, ovate, concave, acute at apex, keeled, 3-nerved, yellowish, margins hyaline. Stamen 1; anthers c. 0.5 mm, oblong. Style c. 1 mm long, linear, thickened at base, sparsely ciliate at top; stigma 2. Nut c. 0.5 mm, obovoid, obscurely vertically striate, biconvex, yellowish.

Narikkadavu, NS & KVB 26237

Fl. & Fr.: November-May

Distribution: Along sides of streams and rivers.

Fimbristylis complanata (Retz.) Link, Enum. Hort. Berol. 1: 292. 1827; Hook. f., Fl. Brit. India 6: 646. 1893; Gamble, Fl. Pres. Madras 1659(1151). 1931; Manilal & Sivar., Fl. Calicut 324. 1982; Rejani, Cyperac. Kerala 310. 1991. *Scirpus complanatus* Retz., Obs. Bot. 5: 14. 1788. *Trichelostylis complanata* (Retz.) Nees in Wight, Contrib. 103. 1834.

Slender annuals; culms 10-20 cm high, tufted, trigonous at base, flat below the inflorescence, smooth. Leaves 8-12 x 0.2 cm, linear, flat, with recurved margins; sheath rounded; ligule a row of short hairs. Umbels 2.5 x 2 cm, contracted; rays 1-3, spreading. Spikelets 5 x 1.5 mm, lanceolate, solitary or 2-3 together, 15-flowered; glumes 2.2 x 1.5 mm, lanceolate, 3-nerved, dark brown. Nut 1 x 0.6 mm, obovate, sparsely tubercled, pale brown.

Ambalappara, KJD 25527

Fl. & Fr.: October-April

Distribution: Rare in Grasslands of Ambalappara.

Fimbristylis dichotoma (L.) Vahl, Enum. Pl. 2: 287. 1805, **ssp. dichotoma**; Gamble, Fl. Pres. Madras 1658(1151). 1931; Manilal & Sivar., Fl. Calicut 326. 1982; Ansari, Fl. Kasaragod Div. 428. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 516. 1988; Rejani, Cyperac. Kerala 270. 1991; Joseph,

Aquatic Angiosp. Malabar 362. 1991. *Scirpus dichotomous* L., Sp. Pl. 50. 1753. *Fimbristylis diphylla* (Retz.) Vahl, Enum. Pl. 2: 289. 1805; Hook. f., Fl. Brit. India 6: 636. 1823. *Scirpus diphyllus* Retz., Obs. Bot. 5: 15. 1788.

Stem caespitose, to 70 cm, rigid, 2.5 mm wide. Leaves canaliculate, rarely flat, as long as the stem or shorter, scabrid, apex acute; ligule a fringe of short hairs; sheaths rusty or pinkish. Inflorescence simple or de-compound, 5-11 cm; involucral bracts 3-7, longest to 10 cm; primary rays 3-5, glabrous or pilose, 4-11 cm; secondary rays 3. Spikelet solitary, ovoid, oblong-ovoid, or terete, to 5 mm, acute; rachilla winged; glumes broadly ovate to suborbicular, to 2 mm, membranous, red-brown, glabrous, sides hyaline, nerveless, mucronulate, keel 3-nerved. Stamen 1; filament to 2 mm; anther linear, to 1 mm. Style 2-fid, basally glabrous; stigmas ciliate. Nut obovoid, biconvex, to 1 mm, glossy, vertical ribs 7-10, obscurely cross-barred, umbonulate, stipitate.

Narikkadavu, NS & KVB 26239

Fl. & Fr.: March-December

Distribution: Fairly common along the sides of Cheenkannipuzha.

Fimbristylis salbundia (Nees) Kunth, Enum. Pl. 2: 230 1837.

Fimbristylis salbundia (Nees) Kunth ssp. *pentaptera* (Nees) Koyama, Bot. Mag. (Tokyo) 87: 317. 1974; Rejani, Cyperac. Kerala 285. 1991. *Trichelostylis pentaptera* Nees in Wight, Contrib. 105. 1834. *Fimbristylis pentaptera* (Nees) Kunth, Enum. Pl. 2:229.1837; Hook. f., Fl. Brit. India 6:645.1893; Gamble, Fl. Pres. Madras 1659(1152). 1931.

Perennials, densely tufted; culms to 30-50 cm high; stem terete. Leaves bladeless. Corymbs compound. Spikelets many, 0.45-0.6 x 0.15-0.2 cm, ovoid-elliptic, subterete, subacute at apex, brownish. Flowers many, up to 60. Glumes 0.25-0.3 x 0.1-0.2 cm, boat-shaped, keeled, membranous. Stamens 3. Style 3-fid. Nuts 0.1-0.2 x 0.07-0.08 cm, orbicular-obovoid, trigonous, each side faintly canaliculate in 20-30 rows of transversely oblong cells.

Ambalappara, NS & KJD 26137

Fl. & Fr.: June-August

Distribution: Rare in Grasslands of Ambalappara.

HYPOLYTRUM L.C. Rich. In Pers., Syn. Pl. 1. 70. 1805.

Hypolytrum nemorum (Vahl) Spreng., Syst. Veg. 1:233.1825; Ansari, Fl. Kasaragod Div. 432. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 519; Rejani, Cyperac. Kerala 324. 1991. *Schoenus nemorum* Vahl, Symb. Bot. 3: 8. 1794. *Hypolytrum latifolium* L.C. Rich. in Pers., Syn. Pl. 1: 70. 1805; Hook. f., Fl. Brit. India 6: 678. 1893; Gamble, Fl. Pres. Madras 1673(1161). 1931.

Erect, rhizomatous perennials, 60-110 cm tall; rhizome woody, short; culms triquetrous. Leaves basal and 1-3 upper on the culm, 60-95 x 1-2 cm, broadly linear, margins scabrid, apex acute, flattish-plicate, subcoriaceous, midnerve scabrid beneath; sheaths to 6 cm long, mouth truncate. Inflorescence terminal corymbose-panicle, compound to de-compound, 3.5-6 cm tall, 4-7 cm across; bracts 2-3, leaf-like, lowest much exceeding the inflorescence. Spikelets 4-6 x 3-4 mm, globose to ellipsoidal. Glumes spiral, 2-2.5 x 1.5-2 mm, ovate-orbicular, obtuse, membranous, light brown. Hypogynous scales 2, hyaline, c. 1 mm long. Stamens 2. Style short; stigmas 2. Nuts 2-3 x 1.5-2 mm, broadly ovate, broadest at slightly below the middle, yellowish-brown.

Kannadivechakunnu, NS & KJD 25567; Paripode, KVB 31674

Fl. & Fr.: Throughout the year
Distribution: Common in all vegetation types.

KYLLINGA Rottb., *Descript. Icon. Nov. Pl.* 12. 1773, *nom. cons.*

Kyllinga pumila Michx., *Fl. Bor.-Amer.* 1: 28. 1803; Govind. & Ramani, *Journ. Econ. Tax. Bot.* 18:339.1994.

Annual herbs; roots many, fibrous, brown, tufted; culms many, densely caespitose, rigid, stiff, obliquely erect, trigonous without basal thickening, 5-35 cm tall. Leaves few, acuminate, shorter or longer than culms, scabrid in upper half margin, gramineous, flat, 2-3 mm broad; lowermost 1-2 sheath leafless, multi-nerved, ovate lanceolate, purplish red; uppermost sheaths tubular with transversely truncate mouth and purple dotted membranous sides. Inflorescence spikate, 3 (-1), confluent, compact with central one ovate, oblong ovate or cylindrical, 6-10 mm long, laterals shorter, subglobose; bracts 3-4, leaf like obliquely divergent without dilated base, the longest up to 8 cm long. Spikelets numerous, lanceolate, compressed, usually 1 flowered, 2-2.2 x 1 mm. First glumes linear or subulate, membranous, nerveless, c. 0.3 mm long, less than c. 0.2 mm broad; second glumes ovate, membranous, faintly 1-nerved in each half, 0.8-0.9 x 0.3 mm; third and fourth glumes 3 nerved in each half, green, usually spinulose with purple marked keel and short excurved or erect mucro. Stamens 2 with broad filaments; anther short, c. 0.2 mm long. Style long, slender. Nut elliptic-oblong or obovoid, stipitate, apiculate, yellowish brown, punctulate, ½ length of glumes, 1 x 0.5-0.6 mm.

Kariyenkappu, NS & KVB 26219

Fl. & Fr.: May-August

Distribution: Common in plantations at Kariyenkappu.

PYCREUS P.Beauv., *Fl. d'Oware & Benin* 2: 48, t. 86. 1807.

- 1a. Stems tufted, nut apiculate 2
1b. Stems solitary, nut truncate or retuse *P.puncticulatus*
2a. Rhachilla straight..... *P.flavidus*
2b. Rhachilla zig zig..... *P. polystachyos*

Pycreus flavidus (Retz.) Koyama, *J. Jap. Bot.* 51: 316. 1976 & in Dassan. & Fosb., *Rev. Handb. Fl. Ceylon* 5: 222. 1985; Rejani, *Cyperac. Kerala* 374. 1991; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 936. 2009. *Cyperus flavidus* Retz., *Obs. Bot.* 5: 13. 1788; Manilal & Sivar., *Fl. Calicut* 314. 1982. *Pycreus globosus* (All.) Rchb., *Fl. Germ. Excurs.* 1: 140. 1830; Gamble, *Fl. Pres. Madras* 1627(1132). 1931. *Cyperus globosus* All., *Fl. Pedem. Auct.* 49: 1789, *non illeg.*; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 506. 1988. *Pycreus capillaris* (Koenig ex Roxb.) Nees ex Clarke in Hook. f., *Fl. Brit. India* 6: 591. 1893.

Herbs; culms 30-45 cm tall. Leaves 10-20 x 0.1 cm, glabrous, mouth of sheath with two truncate flaps. Umbel 8 x 8 cm; bracts 2-3, to 18 cm long; rays spreading. Spikelets 12-16 x 2 mm oblong, obtuse, 12-15 in a spike; glumes 2 x 1.2 mm, 30-40 in a spikelets, 3-5-nerved; keel curved, green. Nut 0.8-0.5 mm, biconvex, distinctly cuspidate, minutely muriculate, dark brown.

Ambalappara, KJD 26246

Fl. & Fr.: January-May

Distribution: Rare in Evergreen forests of Ambalappara.

Pycreus polystachyos (Rottb.) P. Beauv., Pl. Oware Beinn. 2: 48. t.86. f.2. 1807; Hook. f., Fl. Brit. India 6: 592. 1893; Rejani, Cyperac. Kerala 382. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 937. 2009. *Cyperus polystachyos* Rottb., Desc. Nov. Pl. 39. t. 11, f. 1. 1773; Ansari, Fl. Kasaragod Div. 423. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 510. 1988. *Pycreus odoratus* Urban, Symb. Antill. 2: 164. 1900; Gamble, Fl. Pres. Madras 1627(1132). 1931.

Erect tufted, annual herbs; culms 15-34 cm tall, trigonous. Leaves few, 2.5-15 x 0.2-0.4 cm, linear, flat, scabrid on margins in the upper part, gradually acuminate; sheaths 1.5-3.5 cm long, purple brown. Inflorescence compound with well developed rays, but often contracted in a subglobose or irregularly lobed head-like cluster of spikelets without rays; leafy bracts 3 to 5, upto 11 cm long. Spikelets 1-2 x 0.15-0.2 cm, linear or linear-lanceolate, strongly compressed, yellow to straw coloured. Glumes 1.5-2 x 1 mm, ovate, acute, distichous, keeled. Stamens 2, rarely 1. Stigmas 2. Nut c. 1 x 0.5 mm, oblong, biconvex, dark brown.

Narikkadavu, NS & KVB 26236

Fl. & Fr.: Throughout the year

Distribution: Rare along the River sides at Narikkadavu.

Pycreus puncticulatus (Vahl) Nees in Mart., Fl. Bras. 2: 10. 1842; Hook. f., Fl. Brit. India 6: 593. 1893; Gamble, Fl. Pres. Madras 1628(1133). 1931; Rejani, Cyperac. Kerala 390. 1991; Joseph, Aquatic Angiosp. Malabar 390. 1991. *Cyperus puncticulatus* Vahl, Enum. Pl. 2: 348. 1805.

Erect, annual herbs with brownish fibrous roots; culms 23-50 cm tall, triquetrous, smooth. Leaves few, basal, 9-30 x 0.4-0.8 cm, linear, flat, gradually acuminate; sheaths 4-16 cm long, rusty brown. Inflorescence compound, lax, 8-20 cm long and wide, rays closely embraced by a two-lobed sheath; leafy bracts 3-5, the lowest upto 27 cm long. Spikelets spreading, 12-27 x 2-3.5 mm, linear-oblong to oblong-lanceolate, subacute, compressed, brown. Glumes distichous, 2-3 x 1.5-2 mm, ovate-orbicular, folded with green keel, notched at apex, brown, margins, broadly whitish-hyaline, 1-2 basal ones empty. Stamens 2. Style c. 1.5 mm long. Nut stipitate, 1-1.5 x 1-1.5, obovoid, biconvex, emarginate at apex, dark brown, densely punctulate.

Chavachi, NS & KVB 26227

Fl. & Fr.: November-May

Distribution: Fairly common in Evergreen forests of Chavachi and Kattikkari.

SCHOENOPLECTUS (Reichenb.) Palla, Sitzber. Zool. Bot. Ges. Wein 38: 49. 1888, *nom. cons.*

Schoenoplectus mucronatus (L.) Palla in Engl., Bot. Jahrb. Syst. 10: 299. 1889; Rejani, Cyperac. Kerala 422. 1991; Joseph, Aquatic Angiosp. Malabar 400. 1991. *Scirpus mucronatus* L., Sp. Pl. 50. 1753; Hook. f., Fl. Brit. India 6: 657. 1893; Gamble, Fl. Pres. Madras 1666(1156). 1931; Manilal, Fl. Silent Valley 344. 1988.

Erect herbs; culms 40-60 cm high, few together, spongy below, mouth of sheath acute. Spikelets 0.6-1 x 0.6 cm, oblong, 10-25 in a cluster 2.5 cm below the tip of the stem; glumes 4 x 3 mm, obovate, shortly mucronate, pale brown. Nut 2 x 1.7 mm, plano-convex, truncate, apiculate, dark brown; bristles brown, equal to the nut.

Ambalappara, KJD 26248

Fl. & Fr.: October-January

Distribution: Rare in Evergreen forests of Ambalappara near water-bodies.

SCLERIA Berg., Kongl. Vetensk. Acad. Handl. 26: 142, 1765.

Scleria lithosperma (L.) Sw., Prodr. 18. 1788; Hook. f., Fl. Brit. India 6: 685. 1894; Gamble, Fl. Pres. Madras 1677(1163). 1934; Ansari, Fl. Kasaragod Div. 436. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 521. 1988; Verma & Veena, Bull. Bot. Surv. India 32: 61. 1990; Rejani, Cyperac. Kerala 432. 1991. *Scirpus lithosperma* L., Sp. Pl. 51. 1753.

Erect, tufted, rhizomatous perennial herbs; culms 40-60 cm tall; rhizome woody, short; culms trigonous, smooth. Leaves dense at the middle part, scattered all along the stem, 8-33 x 0.2-0.4 cm, linear, margins scabrous, apex obtuse; sheaths narrow, 4-6 cm long, not winged, 3-sided; contraligule short, 1-2 mm long, obtuse, ciliate. Inflorescence narrow, loose, terminal panicle and 2-3 distant lateral ones. Primary bracts leaf-like, much longer than the inflorescence; secondary bracts setaceous. Spikelets few, bisexual, with one female flower and a few males, 3-5 mm long. Glumes 3-4 mm long, ovate, acute, brown. Stamen 1; anthers 1-1.5 mm. Nut 2-3 x 2 mm, ovoid, obtusely trigonous, smooth, shining white; disk reduced to a narrow, brown ring.

Poathanplavu, *KJD 26186*

Fl. & Fr.: Throughout the year

Distribution: Fairly common in Evergreen and Semi-evergreen forests of Paripode, Kannadivechakunnu, Poathanplavu, Chavachi, etc.

POACEAE/ GRAMINAE

1a. Stamens 6 or more.....	2
1b. Stamens 3 or less	4
2a. Staminal filaments free	Bambusa
2b. Staminal filaments united at base in to a tube	3
3a. Stamens more than 16.....	Ochlandra
3b. Stamens 6	Oxytenanthera
4a. Glumes persistent, Spikelets 1-many flowered	20
4b. Glumes decidous, Spikelet 2-flowered.....	5
5a. Spikelets laterally compressed, dissimilar and awned	6
5b. Spikelets dorsally compressed, similar, awnless	12
6a. Inflorscence panicle	7
6b. Inflorscence 1-many digitate or subdigitate.....	10
7a. Spikelets in groups of 3, one sessile and 2-pedicelled.....	Chrysopogon
7b. Spikelets paired or rarely solitary	8
8a. Panicles of paired racemes, aromatic, fragrant grass	Cymbopogon
8b. Panicles not as above, not aromatic.....	9
9a. Panicle interrupted by spathes	Themeda
9b. Panicle not interrupted by spathes	Capillipedium
10a. Spikelets solitary, similar	Dimeria
10b. Spikelets paired, Dissimilar or rarely similar	11
11a. Racemes solitary	Pogonatherum
11b. Racemes two or more	Ischaemum
12a. Spikelets awned or aristate.....	13
12b. Spikelet not as above.....	14
13a. Racemes arranged digitately, spikelets often paired	Alloteropsis
13b. Racemes arranged on central axia, spikelets crowded	Oplismenus
14a. Lower glumes absent or reduced to a minute scale.....	15
14b. Lower glumes well developed	17
15a. Lemma of upper floret crustaceous, spikelets solitary.....	16
15b. Lemma of upper floret thin with hyaline margins, spikelets usually paired..	Digitaria

16a.Spikelets oblong-lanceolate, lower glumes strictly absent	Axonopus
16b.Spikelets ovate or orbicular, lower glume a minute scale or absent.....	Paspalum
17a.Spikelets subtended by bristles	18
17b.Spikelets not subtended by bristles	19
18a.Bristles involucrate, deciduous	Pennisetum
18b.Bristles not as above, persistent	Setaria
19a.Spikelets gibbous and laterally compressed	Cyrtococcum
19b.Spikelets not as above	20
20a.Branches of panicles bifarious, spikelets crowded	Ottochloa
20b.Branches of panicle not bifarious, spikelets not crowded	Panicum
21a.Leaves tessellately nerved.....	Centotheca
21b.Leaves not tessellately nerved.....	22
22a.Spikelets awned	23
22b.Spikelets not awned.....	25
23a.Spikelets with one floret	Garnotia
23b.Spikelets with 2-many florets	24
24a.Spikelets with one fertile floret.....	Jansenella
24b.Spikelets 3-7 fertile florets.....	Tripogon
25a.Inflorescence a panicle	26
25b.Inflorescence of solitary, digitate or subdigitate	28
26a.Glumes equal to or longer than the spikelets	Isachne
26b.Glumes shorter than the spikelets	27
27a.Paleas 2-keeled, keels often hairy or scabrid	Eragrostis
27b.Paleas not 2-keeled, keels glabrous.....	Coelachne
28a.Spikelets with one floret	Cynodon
28b.Spikelets with 2-many florets	Eleusine

ALLOTEROPSIS J. S. Presl. ex. C. B. Presl., Reliq. Haenk. 1. 343.1830.

Alloteropsis cimicina (L.) Stapf in Prain, Fl. Trop. Africa 9: 487. 1919; Gamble, Fl. Pres. Madras 1766(1223). 1934; Manilal & Sivar., Fl. Calicut 339. 1982; Ansari, Fl. Kasaragod Div. 444. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 525. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 214. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 943. 2009. *Milium cimicinum* L., Mant. Pl. 2: 184. 1771. *Axonopus cimicinus* (L.) P. Beauv., Ess. Agrost. 154. 1812; Hook. f., Fl. Brit. India 7: 64. 1896.

Annual herbs; culms 15-100 cm high, decumbent, canaliculate; nodes glabrous or tubercled hairy. Leaves 2-4.5 x 0.7-1.2 cm, oblong-lanceolate or lanceolate, rounded or cordate at base, margins ciliate with tubercle-based hairs, apex abruptly acute; sheath 5-12 cm long, covered with tubercle-based hairs; ligule truncate, fimbriate. Racemes 3-8, digitate, umbellate or corymbose, 4-15 cm long; rhachis angular, scabrid. Spikelets 2-flowered, 2-5 mm long excluding aristae, broadly elliptic. Glumes unequal; lower glume 1.5-2 x 1 mm, ovate-lanceolate, shortly acuminate, 3-nerved; upper glume 3-3.5 x 1 mm, broadly ovate, acuminate, 5-nerved; lower floret male. Upper floret bisexual. First lemma 2-3 x 1 mm, ovate, 5-nerved; second lemma 2-3 x 1 mm, elliptic, margins ciliate, aristate; arista 1-3 mm long, erect, scaberulous; palea 1.5-3 x 0.5-1 mm, ovate or elliptic. Stamens 3, anthers 0.5-1 mm long, yellow. Ovary c. 0.5 mm, oblong; stigmas 0.5-1 mm, violet; grain c. 1.5 x 1 mm, ovate.

Chavachi, NS & KVB 26229

Fl. & Fr.: May-November

Distribution: Common in open areas in all vegetation types.

AXONOPUS P. Beauv., Ess. Agrost. 111. 1812.

Axonopus compressus (Sw.) P. Beauv., Ess. Agrost. 12: 154. 1812; Ansari, Fl. Kasaragod Div. 449. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 527. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 216. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 952. 2009. *Milium compressum* Sw., Prodr. 24. 1788.

Perennial herbs; culms 10-100 cm long, creeping or stoloniferous, rooting at nodes; nodes bearded. Leaves 2-5 x 0.3-1.5 cm, oblong to linear-lanceolate, base rounded or shallowly cordate, margins ciliate, apex acute; sheaths keeled; ligules membranous, fimbriate. Racemes 2-6, binate, digitate or alternate on 2-10 cm long stalk; rachis trigonous. Spikelets 2-2.5 x 0.5-1 mm, oblong-elliptic or elliptic-lanceolate, sessile or shortly pedicelled, green or purplish. Lower glume absent; upper glume 2-2.5 x 1 mm, ovate or elliptic-lanceolate, 5-7-nerved; first lemma 2-2.5 x 1 mm, ovate, elliptic or elliptic-lanceolate, membranous, 5-nerved, epaleate; second lemma 1.5-2 x 1 mm, ovate-oblong, crustaceous, faintly 3-5-nerved, bearded at apex; palea 1.5-2 x 1 mm, oblong, margins infolded. Floret bisexual: stamens 3; anthers c. 0.5 mm long. Ovary 0.5 mm, oblong; styles 0.5 mm; stigmas white.

Kariyenkappu, NS & KVB 26222

Fl. & Fr.: Throughout the year

Distribution: Common along the river sides.

BAMBUSA Schreb., Gen. Pl.: 236 (1789). *nom cons.*

Bambusa bambos (L.) Voss in Vilmorin, Blumengartn 1:1189.1896; Seethalakshmi & Muktesh, Bamboos of India 40. 1998; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 953. 2009. *Arundo bambos* L., Sp. Pl. 81. 1753. *Bambusa bambos* (L.) var. *gigantea* (Bahadur & Jain) Bennet & Gaur, Thirty Seven Bamboos Inida 21. 1990. *Bambusa arundinacea* (Retz.) Willd., Sp. Pl. 2: 245. 1799; Hook. f., Fl. Brit. India 7: 395. 1896; Gamble, Fl. Pres. Madras 1859(1286). 1934.

Culms from a thick stoloniferous rhizome, erect, to 30 m tall and 10-20 cm across; culm sheaths broadly triangular, densely brownish-hairy within, and scattered hairy without. Leaves to 20 cm long; sheaths to 12 x .2 cm, linear, glabrous; ligule short, entire; petiole short. Inflorescence a compound panicle with the spikelets in heads. Spikelets 1-many-flowered, 0.8-2 cm long, oblong, terete; bracts glume-like. Glumes 1-3, to 5.5 mm, broadly ovate, mucronate. Lemmas to 6.5 mm, lanceolate, mucronate, coriaceous, glabrous. Paleas to 7 mm, 2-keeled, ciliate. Stamens 6. Style 1; stigmas 3. Caryopsis linearly cylindrical.

Chavachi, KJD 18706

Flowered during December-January in the Sanctuary.

Distribution: Evergreen forests of Kurukathode and Chavachi.

CAPILLIPEDIUM Stapf in D.Oliver & auct. suc. (eds.), Fl. Trop. Afr. 9: 169 (1917).

Capillipedium assimile (Steud.) A. Camus in Lecomte, Fl. Indo-Chine 7: 314. 1922; Sreek. & V.J. Nair, Fl. Kerala Grasses 55. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 956. 2009. *Andropogon assimilis* Steud. in Zoll., Syst. Verz. 58. 1854; Hook. f., Fl. Brit. India 7: 179. 1896. *Capillipedium glaucopsis* Stapf in Hook., Ic. Pl. t. 3085. 1922; Gamble, Fl. Pres. Madras 1730(1199). 1934.

Annuals, culms 30-60 cm high, nodes bearded. Leaves 5-20 x 0.5-1.2 cm, lanceolate, scabrid; sheath keeled, glabrous; ligule membranous, hairy around. Panicles 8-10 cm long, effuse; axils of racemes with long hairs; joints densely villous. Sessile spikelets 3 x 1.5 mm, oblong; lower glume 3 x 1.5 mm, ovate, 5-nerved, ciliate along margins; upper glume ovate, keeled, 3-nerved;

lower floret empty, upper bisexual; first lemma 1.5 x 1 mm, ovate, obtuse; second lemma forms the base of the awn; paleas absent; stamens 3; styles 2, free; stigma plumose. Pedicelled spikelets 3 x 1.5 mm; pedicels glabrous; lower glume 3 x 1 mm, 8-nerved; upper glume hyaline; first lemma oblong, hyaline; stamens 3; upper floret absent.

Kariyenkappu, KJD 26371

Fl. & Fr.: October-November

Distribution: Plantations of Kariyenkappu

CENTOTHECA Desv., *Nouv. Bull. Soc. Philom. Paris* 2: 189. 1810, *orth. cons.*
Centotheca lappacea (L.) Desv., *Nouv. Bull. Soc. Philom.* 2: 189. 1810; Hook. f., *Fl. Brit. India* 7: 332. 1896; Gamble, *Fl. Pres. Madras* 1848 (1279). 1934; Ansari, *Fl. Kasaragod Div.* 452. 1985; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 529. 1988; Sreek. & V.J. Nair, *Fl. Kerala Grasses* 354. 1991; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 957. 2009. *Cenchrus lappaceus* L., *Sp. Pl.* (ed. 2) 1488. 1763. *Holcus latifolius* Osbeck, *Dagb. Ostind. Resa* 247. 1757. *Centotheca latifolia* (Osbeck) Trin., *Fund. Agrost.* 141. 1820; Sivar. & Mathew, *Fl. Nilambur* 821. 1997.

Perennial herbs; culms 30-80 cm high, tufted, erect; nodes glabrous. Leaves 6-20 x 1.3-3.2 cm, elliptic-lanceolate, base oblique, apex acute or acuminate, with prominent transverse veins; sheaths to 8.5 cm long, ciliate along the margins; ligules membranous. Panicles 8-20 cm long, pyramidal, lax. Spikelets 5-8 mm long, elliptic-oblong, 2-3-flowered. Lower glume 2-3 x 1-1.5 mm, ovate-lanceolate, 5-nerved; upper glume to 3.5 mm long, lanceolate; lemmas 3-4 x 1-2 mm, oblong, 5-7-nerved, glabrous or the upper ones with reflexed, tubercle-based bristles along the margins; paleas c. 3 x 1 mm, elliptic, 2-keeled. Stamens 2 or 3. Stigmas pink. Grains to 1.5 mm long, obovoid.

Meanmutti, NS & KVB 26201

Fl. & Fr.: October-February

Distribution: Common in all vegetation types below 1,200 m.

CHRYSOPOGON Trin., *Fund. Agrost.* 187. 1820, *nom. cons.*

Chrysopogon hackelii (Hook.f.) C.E.C. Fisch. in Gamble, *Fl. Pres. Madras* 1739(1205). 1934; Ramach. & V.J. Nair, *Fl. Cannanore Dist.* 530. 1988; Sreek. & V.J. Nair, *Fl. Kerala Grasses* 62. 1991; Ratheesh Narayanan, *Fl. Stud. Wayanad Dist.* 959. 2009. *Andropogon hackelii* Hook. f., *Fl. Brit. India* 7: 194. 1896.

Robust perennial herbs; culms 80-150 cm high, nodes glabrous. Leaves 15-40 x 0.4-1 cm, linear-lanceolate, glabrous; sheath strongly keeled; ligule a tuft of hairs. Panicle 10-20 cm long, pyramidal. Sessile spikelets 5 x 1.5 mm, lanceolate. Lower glume 5 x 1.5 mm, glabrous, aristate, arista 5 mm long; upper glume 5 mm long, linear-oblong; first lemma 3 x 1 mm, hyaline, ciliate along margins; second lemma oblong; awn 20 mm long; anther 2.5 mm long; pedicelled spikelets 4-5 mm long, acute, awnless.

Ambalappara, KVB 26210

Fl. & Fr.: October-January

Distribution: Common in Grasslands of Ambalappara. Endemic to Peninsular India.

COELACHNE R. Br., Prodr. 1: 187. 1810.

Coelachne simpliciuscula (Wight & Arn. ex Steud.) Benth., J. Linn. Soc. Bot. 19: 93. 1881; Ramach. & V.J. Nair, Fl. Cannanore Dist. 531. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 415. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 959. 2009. *Panicum simpliciusculum* Wight & Arn. ex Steud., Syn. Pl. Glum. 1: 96. 1854. *Coelachne pulchella* R. Br. var. *simpliciuscula* (Wight & Arn. ex Steud.) Hook.f., Fl. Brit. India 7: 271. 1896; Gamble, Fl. Pres. Madras 1804 (1249). 1934.

Aquatic or marshy annual herbs; culms 10-25 cm high, erect or decumbent; nodes bearded. Leaves 2-5 x 0.2-0.5 cm, ovate-lanceolate, glabrous, rounded at base; sheath keeled, glabrous, ligule a row of hairs. Panicle 2-7 cm long, contracted, cylindrical, glabrous. Spikelets similar, 2 x 1 mm, ovate, glabrous. Glumes similar, ovate-orbicular, 3-nerved; florets 2; lower bisexual, upper barren or with a rudimentary ovary; first lemma 2 x 1 mm, ovate, acute, hyaline; palea 2 x 1 mm elliptic. Stamens 3, free. Ovary elliptic; stigma plumose. Upper floret exerted.

Ambalappara, *KJD 26247*

Fl. & Fr.: September-February

Distribution: Rare near streams in Evergreen forests of Ambalappara.

CYMBOPOGON Spreng., Pl. Pugill. 2: 14. 1815.

Cymbopogon flexuosus (Nees ex Steud.) Wats. in Atkins., Gaz. N. W. Prov. Ind. 392. 1882; Gamble, Fl. Pres. Madras 1756(1216). 1934; Ansari, Fl. Kasaragod Div. 454. 1985; Sreek. & V.J. Nair, Fl. Kerala Grasses 71. 1991; 809; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 961. 2009. *Andropogon flexuosus* Nees ex Steud., Syn. Pl. Glum. 1: 388. 1854. *Andropogon nardus* L. var. *flexuosus* (Nees ex Steud.) Hack. in A. & C. DC., Monogr. Phan. 6: 603. 1889; Hook. f., Fl. Brit. India 7: 207. 1896.

Perennial herbs; culms 80-240 cm high, tufted; nodes glabrous. Leaves 20-80 x 1-2 cm, linear, rounded at base, flat; sheaths glabrous; ligule ovate, membranous. Inflorescence a large greyish panicle; branches slender, flexuous, often drooping. Racemes paired, with a spatheole beneath. Spikelets binate, one sessile, other pedicelled. Sessile spikelets 4-5 mm long, elliptic-lanceolate. Lower glume c. 3 x 1 mm, elliptic-lanceolate, keels winged towards apex; upper glume ovate-lanceolate, margins ciliate; lower floret empty. Upper floret bisexual; first lemma 2.5-3 x 1 mm, lanceolate, purplish, epaleate; second lemma c. 2 x 0.4 mm, deeply 2-fid, awned, hyaline, awn 6-10 mm. Stamens 3, anthers 1-2 mm long. Ovary c. 1 mm, oblong, stigmas 1-1.5 mm long. Caryopsis c. 2 mm long, elliptic. Pedicelled spikelets 3-4 mm long, lanceolate; pedicels c. 2 mm long, densely villous; lower glume c. 3 x 1 mm, ovate-lanceolate; upper glume c. 3 x 1 mm, elliptic-lanceolate; lower floret male; upper floret wanting; first lemma c. 3 x 1 mm, elliptic-lanceolate. Stamens 3; anthers 1.5-2 mm long.

Chavachi, *KJD 18702*

Fl. & Fr.: October-January

Distribution: Common along the boundaries of Evergreen forests at Chavachi and Plantations of Kariyenkappu.

CYNODON Richard, in Persoon, Syn. Pl. 1: 85. 1805, *nom. cons.*

Cynodon dactylon (L.) Pers., Syn. Pl. 1: 85. 1805; Hook. f., Fl. Brit. India 7: 288. 1896; Gamble, Fl. Pres. Madras 1835(1270). 1934; Manilal & Sivar., Fl.

Calicut 339. 1982; Ansari, Fl. Kasaragod Div. 455. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 532. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 360. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 963. 2009. *Panicum dactylon* L., Sp. Pl. 58. 1753.

Slender, stoloniferous creeping perennial herbs. Leaves 1-10 x 0.1-0.5 cm, linear-lanceolate, acuminate, glaucous; sheaths keeled; ligules fimbriate, membranous. Inflorescence of terminal, digitate 3-4 spikes; spikes 1-sided, oblong to 5 cm long. Spikelets sessile, 2-3 mm long, oblong-lanceolate, laterally compressed, 1-flowered. Lower glume 1.5-2 x 0.5 mm, lanceolate, chartaceous, 1-nerved; upper glume c. 2 x 0.5 mm, lanceolate, chartaceous, 1-nerved; lemma 2-3 x 1.5-2 mm, boat-shaped, ovate-oblong when spread, keeled; palea 2-2.5 x 0.5-1 mm, boat-shaped or oblong when spread, chartaceous. Stamens 3; anthers 1-1.5 mm long. Ovary c. 0.5 mm long, oblong; stigmas 0.5-1 mm long, pink. Caryopsis 1 mm, linear.

Chathrumala, *KJD* 26207

Fl. & Fr.: March-October

Distribution: Occasional along the paths in open areas.

CYRTOCOCCUM Stapf, in Prain, Fl. Trop. Africa 9: 15. 1917.

Cyrtococcum longipes (Wight & Arn. ex Hook.f.) A. Camus, Bull. Mus. Hist. Nat. Paris 27: 118. 1921; Gamble, Fl. Pres. Madras 1786(1237). 1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 533. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 229. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 964. 2009. *Panicum longipes* Wight & Arn. ex Hook. f., Fl. Brit. India 7: 58. 1896.

Perennials; culms 50-120 cm long, geniculate or trailing; nodes glabrous. Leaves 10-25 x 0.7-1.5 cm, linear-lanceolate, narrowed to the base, membranous, glabrous; sheath keeled, glabrous; ligule membranous. Panicle 10-30 cm long, drooping; branches filiform, smooth. Spikelets 2 x 1 mm; glumes subequal, 1.2-1.5 x 0.7-1 mm; upper one cuspidate; first lemma 1.5 mm long, ovate, epaleate; second lemma 1.5 x 1 mm, concave, crustaceous, 3-nerved; palea oblong, 2-nerved.

Pothurumi, *KVB* 26205; Ambalappara, *NS & KJD* 26241

Fl. & Fr.: August-March

Distribution: Common in open areas in evergreen and semi-evergreen forests.

DIGITARIA Heist. ex Fabricus, Enum. 207. 1759.

1a. Racemes 2-3; rachis not serrate..... *D. longiflora*

1b. Racemes 3-7; rachis serrate *D. ciliaris*

Digitaria ciliaris (Retz.) Koeler, Descr. Gram. 27. 1802; Manilal & Sivar., Fl. Calicut 335. 1982; Ansari, Fl. Kasaragod Div. 458. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 535. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 237. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 968. 2009. *Panicum ciliare* Retz., Obs. Bot. 4. 16. 1786. *Digitaria marginata* Link, Enum. Hort. Berol. 1: 102. 1821; Gamble, Fl. Pres. Madras 1764(1222). 1934. *Paspalum sanguinale* (L.) Lam. var. *rotleri* Hook. f., Fl. Brit. India 7: 15. 1896.

Annual herbs; culms to 60 cm tall, erect or decumbent, rarely creeping and rooting at the lower nodes; nodes glabrous. Leaves 3-8 x 0.3-1 cm, oblong-linear or linear-lanceolate, rounded or shallowly cordate at base, acuminate at apex, flat; sheaths slightly keeled, glabrous or pilose; ligules ovate or truncate, membranous. Racemes 3-7, digitate or subdigitate, to 15 cm

long; rhachis winged, serrate. Spikelets binate, 2.5-3.5 mm long, elliptic or elliptic-lanceolate. Lower glume 2-5 mm long, triangular; upper glume 2-2.5 mm long, lanceolate, 3-nerved. Lower floret empty, epaleate. Upper floret bisexual. First lemma 2.5-3.5 x 0.5 mm, elliptic or elliptic-lanceolate, 7-nerved; second lemma 2.5-3 x 1 mm, elliptic or elliptic-lanceolate, acuminate, crustaceous, brownish-yellow in fruit; palea 2.5-3 x 1 mm, elliptic-lanceolate, subcoriaceous, 2-keeled, 2-nerved. Stamens 3; anthers c. 1 mm long. Ovary c. 1 mm long; stigmas c. 1 mm long, pink.

Kariyenkappu, NS & KVB 26223

Fl. & Fr.: May-November

Distribution: Common in open areas near streams.

Digitaria longiflora (Retz.) Pers., Syn. Pl. 1: 85. 1805; Gamble, Fl. Pres. Madras 1765(1223). 1934; Manilal & Sivar., Fl. Calicut 335. 1982; Ansari, Fl. Kasaragod Div. 458. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 536. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 239. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 969. 2009. *Paspalum longiflorum* Retz., Obs. Bot. 4: 15. 1786; Hook. f., Fl. Brit. India 7: 17. 1896.

Annual herbs; culms 10-40 cm long, slender, creeping or geniculate, rooting at the nodes; nodes glabrous. Leaves 2-7 x 0.3-0.7 cm, elliptic-lanceolate, rounded or shallowly cordate at base, apex acute; sheaths keeled; ligules ovate, membranous. Racemes 2 or 3, digitate, 2-7 cm long; rhachis flat, c. 0.5 mm wide, winged. Spikelets solitary, 1-2 mm long, ovate-elliptic, shortly hairy. Lower glume absent; upper glume 1-2 x 1 mm, ovate-elliptic, chartaceous, 5-9-nerved. Lower floret empty. Upper floret bisexual. First lemma similar to the upper glume; second lemma 1-1.5 x 1 mm, ovate-elliptic, crustaceous; Ppalea 1-1.5 x 0.5 mm, elliptic, 2-keeled, 2-nerved. Stamens 3; anthers c. 0.5 mm. Stigmas c. 1 mm long.

Narikkadavu, NS & KVB 26231

Fl. & Fr.: May-November

Distribution: Common in open areas

DIMERIA R. Br., Prodr. 204. 1810.

Dimeria thwaitesii Hack. in A. & C. DC., Monogr. Phan. 6: 78. 1889; Gamble, Fl. Pres. Madras 1713(1188). 1934; Sreek. & V.J. Nair, Fl. Kerala Grasses 100. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 974. 2009. *Dimeria pusilla* Thw. var. *pallida* Thw. ex Hook. f., Fl. Brit. India 7: 103. 1896.

Culms 30-45 cm tall, tufted; nodes bearded. Leaves 3-6 x 0.3 cm, glabrous. Raceme 3-4.5 cm long, solitary or paired; rachis flat, straight; margins ciliate. Spikelets 4-5.5 mm long; callus hairs 1 mm long; lower glume 4 x 1 mm, hairy along the keel; upper glume 5 x 1.5 mm, aristate, keels with long hairs; first lemma 1.5 x 0.5 mm, 1-nerved; second lemma 3 x 1 mm, awned; awn 9-11 mm long; stamens 2.

Ambalappara, KJD 26244

Fl. & Fr.: January-February

Distribution: Rare in Evergreen forests of Ambalappara.

ELEUSINE Gaertn., Fruct. 1: 7. 1788.

Eleusine indica (L.) Gaertn., Fruct. 1: 8. 1789; Hook. f., Fl. Brit. India 7: 293. 1896; Gamble, Fl. Pres. Madras 1839(1273). 1934; Manilal & Sivar., Fl. Calicut 340. 1982; Ansari, Fl. Kasaragod Div. 459. 1985; Ramach. & V.J. Nair,

Fl. Cannanore Dist. 538. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 371. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 976. 2009. *Cynosurus indicus* L., Sp. Pl. 72. 1753.

Annual herbs; culms tufted, 10-50 cm high; nodes glabrous. Leaves 5-25 x 0.4-0.6 cm, linear-lanceolate or linear, base rounded, blunt at apex, often folded; sheaths keeled, softly pilose; ligule truncate, membranous. Spikes digitate or subdigitate, 2-18, each 3-8 cm long. Spikelets 4-6 mm long, ovate or oblong, 3-6-flowered. Lower glume 1.5-2.5 x 0.5-1 mm, lanceolate, keeled, chartaceous, 3-nerved; upper glume 2-3 x 1 mm, oblong, keeled, chartaceous, 5-nerved; lemmas 2-3 x 1.5-2 mm, ovate-oblong, chartaceous, 3-nerved, sub acute; paleas 2-2.5 x 1 mm, oblong-elliptic, 2-keeled, 2-nerved. Stamens 3; anthers c.0.5 mm long. Ovary c. 0.5 mm long, elliptic; stigmas c. 0.5 mm long, violet. Caryopsis subglobose, deeply grooved on one side, transversely rugose.

Kariyenkappu, NS & KVB 26224

Fl. & Fr.: Throughout the year

Distribution: Common in the Plantation of Kariyenkappu and Semi-Evergreen forests of Narikkadavu and Paripode.

ERAGROSTIS Wolf, Gen. Pl. 23. 1776.

Eragrostis unioides (Retz.) Nees ex Steud., Syn. Pl. Glum. 1:264.1854; Gamble, Fl. Pres. Madras 1826(1264). 1934; Hook. f., Fl. Brit. India 7: 317.1896; Manilal & Sivar., Fl. Calicut 347. 1982; Ansari, Fl. Kasaragod Div. 462. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 542. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 392. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 980. 2009. *Poa unioides* Retz., Obs. Bot. 5: 19. 1788. *Eragrostis amabilis* sensu Stapf in Hook.f., Fl. Brit. India 7: 317. 1896, non Wight & Arn. ex Nees 1838.

Annual herbs; culms tufted, 10-55 cm high, erect or geniculate; nodes glabrous. Leaves 3-18 x 0.2-0.5 cm, linear-lanceolate or lanceolate, base rounded or shallowly cordate, apex acuminate; sheaths to 5 cm long; ligules membranous. Panicles 5-15 cm long, lax. Spikelets 4-6 x 2-4 mm, broadly ovate or ovate-oblong, 10-32-flowered, purplish. Lower glume 1-1.5 x 0.5 mm, lanceolate, 1-nerved; upper glume 1-2 x 0.5-1 mm, ovate-lanceolate; lemmas 1.5-2.5 x 1-1.5 mm, broadly ovate, 3-nerved; paleas 1-2 x 1 mm, elliptic, 2-keeled. Stamens 3, violet. Stigmas white. Grains c. 1 mm long, ellipsoid, reddish-brown.

Kariyenkappu, SASI & KVB 26221

Fl. & Fr.: Throughout the year

Distribution: Common in all vegetation types.

GARNOTIA Brongn., in Duperrey, Voy. Coq. Bot. Phan. 2: 132, t. 21. 1832.

- 1a. Leaves rounded or cordate at base, lower glume equal to upper glume *G. arundinacea*
- 1b. Leaves narrowed to the base; lower glume longer than the upper glume *G. tenella*

Garnotia arundinacea Hook. f., Fl. Brit. India 7: 243. 1896; Gamble, Fl. Pres. Madras 1812(1255). 1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 543. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 409. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 981. 2009.

Perennial herbs; culms 40-90 cm tall, robust, geniculate; nodes thickened and bearded. Leaves 10-18 x 1.5-2 cm, ovate-oblong, rounded at base, terminating into a filiform tip, ciliate along the margins; sheath rounded, ligule a membrane. Panicle 5-15 cm, congested, branches angled, scabrid. Spikelets 2.5 x 1 mm, pedicelled. Glumes equal, 2.5 x 1 mm, aristate, 3-nerved, scabrid along the nerves; lemma similar to glumes, bifid at tip, awned; awn 7 mm long; palea 2 x 0.5 mm, oblong. Anthers 1.2 mm long.

Ambalappara, NS & KJD 26243; KVB 26209

Fl. & Fr.: July-December

Distribution: Common near water bodies in the Evergreen forests of Ambalappara.

Garnotia tenella (Arn. ex Miq.) Janowsky, Feddes Repert. 17:86.1921; Ansari, Fl. Kasaragod Div. 464. 1985; Sreek. & V.J. Nair, Fl. Kerala Grasses 413. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 983. 2009. *Berghausia tenella* Arn. ex Miq., Verh. Kon. Nederl. Inst. 3: 34. 1851. *Garnotia stricta* sensu Hook.f., Fl. Brit. India 7: 243. 1896, non Brongn. 1832; Gamble, Fl. Pres. Madras 1812(1255). 1934.

Annuals or perennial herbs; culms 10-50 cm high, tufted; nodes bearded. Leaves 10-18 x 0.2-0.6 cm, lanceolate, scabrid along the margins; sheath rounded, ligule membranous. Panicle 5-30 cm long, effuse, branches angled. Spikelets 3.5 x 1 mm, lanceolate, glabrous. Glumes subequal, 3-3.5 x 1 mm, aristate, 3-nerved; lemma 2.5 x 1 mm, lanceolate, 3-nerved; palea 2 x 0.5 mm, hyaline. Stamens 3.

Ambalappara, KJD 25518

Fl. & Fr.: May-December

Distribution: Rare in Evergreen forests of Ambalappara.

ISCHAEMUM L. Sp. Pl. 2: 1049. 1753

Ischaemum indicum (Houtt.) Merr., J. Arnold Arbor. 19: 320. 1938, **ssp. indicum var. indicum**; Mohanan, Fl. Quilon Dist. 474. 1984; Ramach. & V.J. Nair, Fl. Cannanore Dist. 545. 1988; R. Kr. Singh & P.S.N. Rao, J. Econ. Tax. Bot. 32: 812. 2008; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 988. 2009. *Phleum indicum* Houtt., Nat. Hist. 3:198,t.90. f.2. 1782. *Ischaemum aristatum* C.E.C. Fisch. in Gamble, Fl. Pres. Madras 1721(1193). 1934, non L. 1753. *Ischaemum ciliare* Retz., Obs. Bot. 6: 36. 1791; Hook. f., Fl. Brit. India 7: 133. 1896.

Perennials; culms 20-100 cm high, tufted; nodes densely villous. Leaves linear-lanceolate, 4-20 x 0.3-1 cm, acuminate, narrowed and sometimes petiolate at bases, glabrous or densely villous. Sheaths keeled. Racemes 2, 3-8 cm long; joints turbinate, 2-2.5 mm long, densely ciliate. Sessile spikelets oblong or obovate, 5-6 mm long, awned; lower glume oblong or obovate, slightly notched at apex, winged on either side, 4.5-5.5 x 1-1.5 mm, chartaceous, 7-9 nerved, densely long pilose; upper glume, florets, lemmas and paleas similar to those of the var. *indicum*, but larger.

Kariyenkappu, KJD 26233

Fl. & Fr.: October-November.

Distribution. Common in Plantations and Grasslands.

ISACHNE R. Br., Prodr. 196. 1810.

- 1a. Lemma ciliate, spikelet less than 3 mm..... *I. globosa*
1b. Lemma not ciliate, spikelet more than 3 mm..... *I. walkeri*

Isachne globosa (Thunb.) O. Ktze., Rev. Gen. Pl. 2: 778. 1891; Sreek. & V.J. Nair, Fl. Kerala Grasses 421. 1991. *Milium globosum* Thunb., Fl. Japan 49. 1784. *Isachne australis* R. Br., Prodr. 1: 196. 1810; Hook. f., Fl. Brit. India 7: 24. 1896. *Isachne dispar* Hook.f., Fl. Brit. India 7: 26. 1896p.p., non Trin. 1828.

Trailing perennial herbs; culms 30-60 cm high, trailing; nodes glabrous. Leaves 4-10 x 0.2-0.6 cm, ovate-lanceolate, glabrous, base rounded, margin serrulate; sheath glabrous; ligule a tuft of hairs. Panicle 4-10 cm long, branches serrulate. Spikelets 2-2.5 x 1.5-2 mm, globose. Glumes similar, 1.5-2 x 1 mm, broadly ovate; first lemma 2 x 1 mm, obtuse, glabrous; palea 2-nerved; second lemma 1.25 x 1 mm, broadly ovate, obtuse, ciliate along the margin; palea 1 x 1 mm, 2-keeled. Stamens 3; anthers 1.5-2 mm long.

Ambalappara, KVB 26216

Fl. & Fr.: Throughout the year

Distribution: Common in Evergreen forests of Ambalappara.

Isachne walkeri (Arn. ex Steud.) Thw., Enum. Pl. Zeyl. 361. 1864; Hook. f., Fl. Brit. India 7: 26. 1896; Gamble, Fl. Pres. Madras 1797(1244). 1934; Sreek. & V.J. Nair, Fl. Kerala Grasses 426. 1991; Mohanan & Sivad., Fl. Agasthyamala 828. 2002. *Panicum walkeri* Arn. ex Steud., Syn. Pl. Glum. 1: 97. 1854.

Stout perennial herbs; culms trailing or erect, 60-120 cm high, robust; nodes glabrous, rooting from lower ones. Leaves 15-25 x 1.5-2.5 cm, lanceolate, subcoriaceous, glabrous; margins cartilaginous; sheath rounded, ligule a tuft of hairs. Panicle lax; branches with glandular bands. Spikelets 3-4 mm long, pedicelled, ovate, acute. Glumes equal, 3 x 1 mm, ovate, obtuse, glabrous; lemmas 3 x 1.5 mm, ovate, obtuse, coriaceous; palea 3 x 1 mm. Stamens 3; ovary elliptic, stigma plumose.

Ammayikallu, KVB 26217

Fl. & Fr.: August-March

Distribution: Common in open areas.

JANSENELLA N. L. Bor, Kew Bull. 10: 96. 1955.

Jansenella griffithiana (C. Muell.) Bor, Kew Bull. 1955: 98. 1955; Ramach. & V.J. Nair, Fl. Cannanore Dist. 546. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 348. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 991. 2009. *Danthonia griffithiana* C. Muell., Bot. 2. 14. 347. 1856. *Arundinella avenacea* Munro ex Thw., Enum. Pl. Zeyl. 362. 1864; Hook. f., Fl. Brit. India 7: 69. 1896; Gamble, Fl. Pres. Madras 1801(1246). 1934.

Annual herbs; culms 9-18 cm long, creeping and geniculate. Leaves 0.8-3.5 x 0.5-1 cm, elliptic-lanceolate, base amplexicaule, apex acuminate; sheaths slightly keeled; ligules ovate, membranous. Panicles densely compact, capitate, to 3.5 cm long. Spikelets 5-8 mm long, elliptic-lanceolate. Lower glume 4-5 mm long, lanceolate, acuminate; upper glume 5-8 x 1-1.5 mm, lanceolate, caudate-acuminate, 3-5-nerved. Lower floret male. Upper floret bisexual. First lemma 4-5 x 1-2 mm, oblong-lanceolate, acuminate; palea c. 3x1 mm, oblong, notched, hyaline, 2-keeled. Stamens 3. Second lemma 3-4 x 1-1.5 mm, oblong, notched, 2-aristate, with tufted hairs on either side, awned; awn to 1 cm long; palea 2-3 mm long, linear-oblong, notched, 2-keeled, hairy on dorsal side. Stamens 3. Stigmas c.1 mm long.

Ambalappara, KJD 25525

Fl. & Fr.: October-December

Distribution: Rare in the Grasslands of Ambalappara.

Oxytenanthera Munro, Trans. Linn. Soc. London 26: 126. 1868.

Oxytenanthera monadelpha (Thw.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.) 342. 1931; Gamble, Fl. Pres. Madras 1861(1288). 1934; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 997. 2009. *Dendrocalamus monadelphus* Thw., Enum. Pl. Zeyl. 376. 1864. *Pseudoxytenanthera monadelpha* (Thw.) Sodestrom & Ellis, Smiths. Contrib. Bot. 72: 52. 1988. *Oxytenanthera thwaitesii* Munro, Trans. Linn. Soc. London 26: 129. 1868; Hook. f., Fl. Brit. India 7: 402. 1896.

Large shrubby bamboo; culms, tufted. Leaves to 20 x 3 cm, ovate, lanceolate, long acute at apex, margins, minutely serrate. Panicles of spicate branches; spikelets in clusters, forming pseudo-panicles, to 1.5 cm long, with 1 fertile and 2 dormant florets. Lower glume 5 mm, obovate-triangular, mucronate, ciliate along the margins and upper part; upper glume 9 mm, oblong-triangular, lemma 12 mm, ovate-elongate, mucronate; palea little smaller. Stamens 6, filaments united.

Ambalappara, NS & KJD 31958; KJD 26348

Fl. & Fr.: September-January

Distribution: Common in Evergreen forests of Ambalappara.

Endemic to Western Ghats.

OCHLANDRA Thw. Enum. Pl. Zeyl. [Thwaites] 376 (1864).

Ochlandra travancorica (Bedd.) Benth. ex Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 125. t.111. 1896 & Hook. f., Fl. Brit. India 7: 419. 1896; Gamble, Fl. Pres. Madras 1863(1289). 1934; Seethalakshmi & Muktesh, Bamboos India 191. 1998; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 994. 2009. *Bheesha travancorica* Bedd., Fl. Sylv. t.324. 1891. *Ochlandra travancorica* Benth. ex Gamble var. *hirsuta* Gamble, Ann. Roy. Bot. Gard. (Calcutta) 7: 126. 1896 & Gamble, Fl. Pres. Madras 1863 (1290). 1934. *Ochlandra sivagiriana* (Gamble) Camus, Les Bambusees 181. 1913. *Ochlandra soderstromiana* Muktesh & Stephen, Rheedeia 9: 33. 1999.

Tall reed-like grasses; rootstock rhizomatous, branched; culms to 5 m tall, densely clumped, hollow, covered with culm sheaths; culm sheaths with small limbs. Leaves scattered, 20-40 x 5-10 cm, oblong-lanceolate, base truncate, or cuneate, glabrous; sheaths tubular, mouth with stiff bristles; ligule short. Panicles large, spicate. Spikelets in verticils, 3-9 together, sessile, 5-6 cm long; glumes 2-5, unequal, to 5 cm long, lanceolate, mucronate, smooth; florets one, bisexual; lemmas 5 cm long, elliptic-oblong, muticous; palea membranous, stamens 20-40, filaments monadelphous; style long; stigma 4-6; fruit ovoid, 2-3 x 1.5 cm, beaked, smooth.

Kariyenkappu, KJD 18710

Fl. & Fr.: November-May

Distribution: Planted at Kariyenkappu and Chavachi.

OPLISMENUS P. Beauv., Fl. Oware 2: 14, 1809, *nom. cons.*

Oplismenus compositus (L.) P. Beauv., Ess. Agrost. 54. 168. 1812; Hook. f., Fl. Brit. India 7: 66. 1896; Gamble, Fl. Pres. Madras 1778(1231). 1934; Manilal & Sivar., Fl. Calicut 341. 1982; Ansari, Fl. Kasaragod Div. 470. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 547. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 257. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 995. 2009. *Panicum compositum* L., Sp. Pl. 57. 1753.

Annual herbs; culms 25-80 cm long, trailing, creeping and rooting at the lower nodes; nodes softly hairy. Leaves 1.5-7 x 0.8-2 cm, elliptic-lanceolate or ovate-lanceolate, base oblique, margins wavy, apex acuminate, hispid; sheaths to 6 cm long; ligule a row of hairs. Inflorescence 8-20 cm long, lax; racemes 4-8, each 1.5-11 cm long; rachis triquetrous, pilose. Spikelets paired, 3-4 mm long, elliptic, distant, sessile. Lower glume 2-3 x 1 mm, lanceolate, awned; awn 4-6 mm long; upper glume 2-3 x 1 mm, ovate-elliptic, aristate. Lower floret barren. Upper floret bisexual. First lemma 3-4 x 1-2 mm, ovate; palea 1-2 mm long, lanceolate; second lemma 2-3 x 1 mm, elliptic, subcoriaceous; palea 2-3 x 1 mm, elliptic, subcoriaceous, 2-keeled. Stamens 3; anthers c. 1 mm long, purple. Stigma c 1 mm long, reddish. Grains c. 1 mm long, ellipsoid.

Ammayikallu, KVB 26218

Fl. & Fr.: Throughout the year

Distribution: Rare in Evergreen forests at Ammayikallu.

OTTOCHLOA Dandy, J. Bot. 69: 54. 1931.

Ottochloa nodosa (Kunth) Dandy, J. Bot. 69: 55. 1931; Gamble, Fl. Pres. Madras 1778(1232). 1934; Sreek. & V.J. Nair, Fl. Kerala Grasses 258. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 997. 2009. *Panicum nodosum* Kunth, Enum. Pl. 1: 97. 1833; Hook. f., Fl. Brit. India 7: 43. 1896.

Perennial herbs; culms 25-80 cm long, creeping, rooting at the lower nodes. Leaves 3-11 x 0.6-1.3 cm, elliptic-lanceolate, base rounded, apex acuminate; sheaths to 4 cm long, ciliate along one margin; ligules narrow, membranous. Panicles 6-14 cm long, lax; racemes 5-10, alternate, opposite, each 1-8 cm long. Spikelets 3-4 mm long, elliptic-lanceolate. Lower glume to 1.5 x 1 mm, ovate-lanceolate, 3-5-nerved; upper glume 1.5-2 x 1 mm, elliptic-lanceolate, 7-nerved. Lower floret barren, epaleate. Upper floret bisexual. First lemma 3-4 mm long, elliptic-lanceolate; second lemma c.3 x 1.5 mm, elliptic, subcoriaceous; palea 2-3 x 1 mm, elliptic, subcoriaceous, 2-keeled. Stamens 3; anthers yellow. Stigmas purple.

Kariyenkappu, NS & KJD 26115

Fl. & Fr.: June-December

Distribution: Common in open areas.

PANICUM L., Sp. Pl. 55. 1753.

Panicum notatum Retz., Obs. Bot. 4: 18. 1786; Ansari, Fl. Kasaragod Div. 472. 1985; Sreek. & V.J. Nair, Fl. Kerala Grasses 267.1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 999. 2009. *Panicum montanum* Roxb., Fl. Ind. 1: 315. 1820; Hook. f., Fl. Brit. India 7: 53. 1896; Gamble, Fl. Pres. Madras 1783(1235). 1934; Vajr., Fl. Palghat Dist. 583. 1990.

Perennial herbs; culms to 2 m tall, erect; nodes glabrous. Leaves 7-20 x 1-3.5 cm, lanceolate, base subcordate, apex acuminate, flat, midrib prominent; sheaths to 10 cm long, ciliate along one margin; ligules membranous with a few long hairs behind. Panicles 15-30 cm long, lax; branches to 21 cm long. Spikelets 2.5-3 mm long, ovate-oblong, acute; pedicels to 1.5 cm long. Lower glume c.2 x 1 mm, ovate-lanceolate, acute; upper glume c. 2 x 1 mm, ovate. Lower floret barren. Upper floret bisexual. First lemma c. 2.5 x 1 mm, ovate. Palea absent. Second lemma c. 2 x 1.5 mm, ovate. Palea absent. Second lemma c. 2 x 1.5 mm, ovate, subcoriaceous. Palea c. 2 x 1 mm, ovate, subcoriaceous. Stamens 3; anthers yellow. Ovary elliptic; stigmas c. 1 mm long, violet. Grains c. 1.5 mm long, ovate.

Fl. & Fr.: September-December

Distribution: Fairly common in the Moist deciduous forests of Amayikallu, Bhoothamkallu and also in Plantations of Kariyenkappu.

PASPALUM L., Syst. Nat. ed. 10, 2: 855. 1759.

- 1a. Spikelets 2 mm long, glumes glabrous *P. scrobiculatum*
1b. Spikelets 1.5 mm, glumes ciliate 2
2a. Racemes paired or rarely 3, rachis flat *P. conjugatum*
2b. Racemes 3 or more, alternate, rachis subtriquetrous *P. canarae*

Paspalum canarae (Steud.) Veldk., Blumea 21: 72. 1973; Sreek. & V.J. Nair, Fl. Kerala Grasses 282. 1991; Mohanan & Sivad., Fl. Agasthyamala 836. 2002. *Panicum canarae* Steud., Syn. Pl. Glum. 1: 58. 1853. *Paspalum compactum* sensu Hook.f., Fl. Brit. India 7: 12. 1896, non Roth ex Roem. & Schult. 1817; Gamble, Fl. Pres. Madras 1772(1228). 1934; Vajr., Fl. Palghat Dist. 584. 1990.

Annual herbs; culms 10-30 cm high, trailing; nodes hairy. Leaves 2-5 x 0.5-1.2 cm, ovate, acute, cordate and decurrent at base, densely hairy; sheath keeled, hairy; ligule a small ridge only. Racemes 8-15, rachis covered with bulbous based hairs. Spikelets 1.2 x 1 mm, usually paired at the basal part of the raceme; upper glume 1 x 0.5 mm, elliptic, 3-nerved, glabrous; first lemma 1.2 x 1 mm, 3-nerved; second lemma 1 x 0.9 mm, nerveless, crustaceous; palea similar to lemma.

Ambalappara, NS & KJD 26242

Fl. & Fr.: October-December

Distribution: Rare near small streams in Evergreen forests of Ambalappara. Endemic to Peninsular India.

Paspalum conjugatum Berg., Act. Helv. Phys. Math. 7: 129. 1772; Hook. f., Fl. Brit. India 7: 11. 1896; Gamble, Fl. Pres. Madras 1772(1228). 1934; Manilal & Sivar., Fl. Calicut 337. 1982; Ansari, Fl. Kasaragod Div. 474. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 550. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 285. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1003. 2009.

Perennial herbs; culms to 150 cm long, creeping or stoloniferous, rooting at the nodes; nodes glabrous. Leaves 3-18 x 0.4-1.3 cm, lanceolate, base rounded or narrowed, apex acuminate; sheaths to 6 cm long, keeled, ciliate along one margin; ligules membranous. Racemes 2, 4-11 cm long, conjugate. Spikelets 1.5-2 mm long, orbicular or broadly elliptic, creamy-yellow. Lower glume absent; upper glume 1-1.5 x 1 mm, orbicular or ovate, membranous, long ciliate along the margins. Lower floret barren. Upper floret bisexual. First lemma 1-1.5 x 1 mm, orbicular or ovate, membranous; second lemma c. 1 x 1 mm, ovate or orbicular, crustaceous, 2-keeled. Stamens 3; anthers yellow. Stigmas white.

Chavachi, NS & KVB 26228

Fl. & Fr.: Throughout the year

Distribution: Common in open areas near streams.

Paspalum scrobiculatum L., Mant. Pl. 1: 29. 1767; Hook. f., Fl. Brit. India 7: 10. 1896; Gamble, Fl. Pres. Madras 1772(1227). 1934; Manilal & Sivar., Fl. Calicut 337. 1982; Ansari, Fl. Kasaragod Div. 474. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 551. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 287. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1004. 2009. *Paspalum orbiculare* Forst., Fl. Ins. Aust. Prodr. 7. 1786; Gamble, Fl. Pres. Madras 1772(1227). 1934.

Annual or perennial herbs; culms 15-80 cm high, tufted, erect or creeping and rooting at the lower nodes; nodes glabrous. Leaves 3.5-36 x 0.4-1 cm, lanceolate to linear, base rounded, apex acuminate; sheaths to 15 cm long; ligules membranous, ciliate. Racemes usually 2, rarely 3-5, 2.5-7 cm long; rachis flat. Spikelets 2-ranked or 3-ranked, 2-3.5 mm long, ovate-orbicular or obovate, obtuse. Lower glume absent. Upper glume 2-3.5 x 2-2.5 mm, ovate or orbicular, membranous. Lower floret barren. Upper floret bisexual. First lemma 2-3.5 x 2-2.5 mm, ovate or orbicular, crustaceous; palea 2-2.5 x 1.5-2 mm, ovate or orbicular, crustaceous, inflexed. Stamens 3; anthers yellow or brown. Ovary c. 0.5 mm long; stigmas creamy yellow or violet in colour.

Chavachi, NS & KVB 26230

Fl. & Fr.: Throughout the year

Distribution: Common in the Evergreen forests of Chavachi and Plantations of Kariyenkappu near streams.

PENNISETUM L.C. Rich. ex Persoon, Syn. Pl. 1: 72. 1805.

Pennisetum polystachyon (L.) Schult., Syst. Veg. 2: 146. 1824; Gamble, Fl. Pres. Madras 1792(1241). 1934; Manilal & Sivar., Fl. Calicut 340. 1982; Ansari, Fl. Kasaragod Div. 475. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 551. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 291. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1006. 2009. *Panicum polystachyon* L., Syst. Nat. (ed. 10) 2: 870. 1759. *Pennisetum setosum* (Sw.) L.C. Rich. in Pers., Syn. Pl. 1: 72. 1805; Hook. f., Fl. Brit. India 7: 87. 1896. *Cenchrus setosus* Sw., Prodr. 26. 1788.

Stout annual herbs; culms to 1.5 m tall, erect; nodes glabrous. Leaves 10-30 x 0.4-1.3 cm, linear or linear-lanceolate, base rounded, apex acuminate, tubercle-based hairy or glabrous; sheaths to 22 cm long, keeled, villous at mouth; ligules membranous, fimbriate. Panicles 7-18 cm long, spiciform, creamy-yellow or reddish-purple; rhachis angular with sharp-edged decurrent wings. Involucre enclosing one sessile spikelet. Spikelets 3-4 mm long, lanceolate. Lower glume 0.5-1 mm long, ovate-acute; upper glume c. 3 x 1.5 mm, ovate-lanceolate. Lower floret male or barren. Upper floret bisexual. First lemma c. 3 x 1.5 mm, ovate-lanceolate; palea hyaline. Second lemma 2-3 x 1 mm, oblong-acute, coriaceous; palea c. 2 x 1 mm, oblong, coriaceous. Stamens 3; anthers yellow. Ovary c. 0.5 mm long; stigma golden-yellow. Grains cylindrical, dorsally compressed.

Chavachi, KVB 31612; Kariyenkappu, NS & KVB 26203

Fl. & Fr.: April-December

Distribution: Common in open areas, mostly along road side and Plantation.

POGONATHERUM P. Beauv., Ess. Agrost. 56. 1812.

Pogonatherum crinitum (Thunb.) Kunth, Enum. Pl. 1: 476. 1833; Hook. f., Fl. Brit. India 7: 141. 1896; Sur, Journ. Econ. Tax. Bot. 6: 665. 1985; Ansari, Fl. Kasaragod Div. 476. 1985; Sreek. & V.J. Nair, Fl. Kerala Grasses 176. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1007. 2009. *Andropogon crinitum* Thunb., Fl. Jap. 40. 1784. *Pogonatherum paniceum* sensu Gamble, Fl. Pres. Madras 1714(1188). 1934, non (Lam.) Hack. 1906.

Perennial herbs; culms densely tufted, 12-22 cm high; nodes sparsely villous. Leaves 1-4 x 0.1-0.4 cm, elliptic-lanceolate, base narrowed, apex acute; sheaths villous towards mouth; ligules membranous. Raceme solitary, 1-2.5 cm long, slender. Sessile spikelets 1.5-2 mm long, lanceolate, awned, yellow. Lower glume c. 1 mm long, oblong; upper glume 1.5-2 mm long, ovate-

lanceolate, awned; awns 15-25 mm long. Lower floret empty; upper floret bisexual; first lemma c. 1 mm long, ovate-oblong, epaleate; second lemma c. 1.5 mm long, notched, awned; awn 2-3 cm long; palea c. 1 mm long, ovate-oblong, hyaline, 2-keeled. Stamen 1; anthers pale yellow. Stigmas cream coloured. Pedicelled spikelets similar.

Ambalappara, KVB 31689

Fl. & Fr.: December-March

Distribution: Fairly common in Grasslands of Ambalappara.

PSEUDECHINOLAENA Stapf in D.Oliver & auct. suc. (eds.), Fl. Trop. Afr. 9: 494 (1919).

Pseudechinolaena polystachya (HBK) Stapf in Oliver, Fl. Trop. Africa 9: 495. 1919; Gamble, Fl. Pres. Madras 1766(1224). 1934; Ramach. & V.J. Nair, Fl. Cannanore Dist. 553. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 293. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1008. 2009. *Echinolaena polystachya* HBK, Nov. Gen. Sp. 1: 119. 1816. *Panicum uncinatum* Raddi, Agrost. Bass. 41: 1823; Hook. f., Fl. Brit. India 7: 58. 1896.

Slender annuals; nodes appressed pubescent. Leaves ovate-lanceate, 1.5-4.5 by 0.5-1 cm, base oblique, apex acute, pilose. Inflorescences of distant racemes. Spikelet ovoid, solitary, dorsally compressed; lower glume broadly ovate, 3-nerved, aristate; upper glume boat-shaped, 7-nerved, with rows of hooked bristles in between; lower lemma ovate, 3-nerved; palea convolute. Upper lemma crustaceous, 5-nerved, paleate. Stamens 3. Grain oblong, gibbous on the back.

Kattikkari, KJD 26178

Fl. & Fr.: September-February

Distribution: Rare in Kattikkari near waterlogged area

SETARIA P. Beauv., Ess. Agrost. 51, 178, t. 13, f. 3. 1812.

Setaria pumila (Poir.) Roem. & Schult., Syst. Veg. 2: 891. 1817; Ansari, Fl. Kasaragod Div. 479. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 554. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 309. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1014. 2009. *Panicum pumilum* Poir. in Lam., Encycl. Suppl. 4: 273. 1816. *Setaria pallida-fusca* (Schum.) Stapf & C.E. Hubb., Bull. Misc. Inform. Kew 1930: 259. 1930; Gamble, Fl. Pres. Madras 1789(1239). 1934; Manilal & Sivar., Fl. Calicut 340. 1982. *Panicum pallida-fuscum* Schum., Beskr. Guin. Pl. 58. 1827.

Annual herbs; culms 30-105 cm high, erect; nodes glabrous. Leaves 5-23 x 0.4-1 cm, linear or lanceolate, base rounded, apex acuminate, sparsely hairy; sheaths to 8 cm long, keeled; ligules membranous, ovate. Panicles 4-10 cm long, spiciform, cylindric, yellowish; bristles 3-7 mm long, scabrid. Spikelets 2-2.5 mm long, ovate or subglobose. Lower glume 1-1.5 mm long, ovate-acute; upper glume 1-2 mm long, ovate or orbicular. Lower floret male or barren. Upper floret bisexual. First lemma 2-2.5 x 1-2 mm, ovate-elliptic; palea 1.5-2 x 1-1.5 mm, elliptic, hyaline, 2-keeled. Stamens 3. Second lemma 2-2.5 mm long, ovate, beaked, rugose; palea 1.5-2 x 1 mm, ovate-oblong, crustaceous, rugose, 2-keeled. Stamens 3. Ovary oblong. Grains c. 1.5 mm long, ellipsoid.

Karienkappu, KJD 25526

Fl. & Fr.: July-November

Distribution: Common in Plantations and Moist deciduous forests.

THEMEDA Forssk., Fl. Aegypt.-Arab. 178. 1775.

- 1a. Spikelets with dense white callus hairs *T. cymbaria*
1b. Spikelets with brown callus hairs *T. triandra*

Themeda cymbaria (Roxb.) Hack. in A. & C. DC., Monogr. Phan. 6:668.1889; Gamble, Fl. Pres. Madras 1746(1210). 1934; Sreek. & V.J. Nair, Fl. Kerala Grasses 196. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1018. 2009. *Anthistiria cymbaria* Roxb., Fl. Ind. 1: 255. 1820.

Perennial herbs; culms 60-250 cm high, stout, densely tufted. Leaves up to 120 x 1 cm, linear-lanceolate, nerves and margins sharply scabrous; sheath acutely keeled, glabrous; ligule membranous. Panicle 30-80 cm long, lax, bracts brown, boat-shaped; racemes 5-8 mm long, clustered. Involucral spikelets 4 x 1 mm, at different levels. Glumes subequal, glabrous; containing a male florets. Sessile bisexual spikelets 4-5 x 1 mm, with dense white callus hairs; lower glumes 4 x 1 mm, lanceolate, hirtus, coriaceous; first lemma oblong, chartaceous; second lemma awned; awn to 20 mm long.

Ambalappara, KVB 26226

Fl. & Fr.: October-May

Distribution: Common in Grasslands. Endemic to Peninsular India.

Themeda triandra Forssk., Fl. Aeg.-Arab. 178. 1775; Gamble, Fl. Pres. Madras 1746(1209). 1934; Manilal & Sivar., Fl. Calicut 336. 1982; Ramach. & V.J. Nair, Fl. Cannanore Dist. 555. 1988; Sreek. & V.J. Nair, Fl. Kerala Grasses 202. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1019. 2009. *Anthistiria imberbis* Retz., Obs. Bot. 3: 11. 1783; Hook. f., Fl. Brit. India 7: 211. 1896.

Perennial herbs; culms 50-170 cm high, erect, tufted; nodes glabrous. Leaves 10-25 x 0.4-0.8 cm, lanceolate, base rounded, apex acute, glabrescent; sheaths to 8 cm long, keeled; ligules membranous, fimbriate. Panicles 20-45 cm long; racemes to 6 x 3 cm; spatheoles 3-8 cm long, tuberculate-pilose. Involucral spikelets 2 pairs, 7-11 mm long, elliptic-lanceolate; lower glume 7-10 mm long, elliptic, 2-keeled; upper glume 7-10 x 1-2 mm, lanceolate. Lower floret empty. Upper floret male; first lemma 7-10 x 1-2 mm, elliptic-lanceolate; second lemma c. 1 mm long, ovate-acute; stamens 3. Sessile spikelets solitary in a raceme, 7-10 mm long, oblong. Glumes oblong-lanceolate, lower 6-10 x 1-2 mm, upper 6-8 mm long; lower floret empty; upper floret bisexual; lemmas 3-5 mm long, elliptic, awns 2-5 cm long; stamens 3. Pedicelled spikelets 2 in a raceme, 6-10 mm long, lanceolate; glumes and spikelets more or less similar to those of the involucral spikelets.

Asthippara, KVB 31632

Fl. & Fr.: October-January

Distribution: Common in open areas in Evergreen forests from Mullenpara to Ambalappara.

TRIPOGON Roem. & Schult., Syst. Veg. 2: 34, 600. 1817.

Tripogon bromoides Roem. & Schult., Syst. Veg. 600. 1817; Gamble, Fl. Pres. Madras 1834(1269). 1934; Sreek. & V.J. Nair, Fl. Kerala Grasses 399. 1991; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 1020. 2009.

Densely tufted perennial herbs; culms 10-35 cm high; nodes glabrous. Leaves usually basal, 5-30 x 0.1-0.3 cm, linear, base rounded, sparsely hairy

above; mouth of sheath with long hairs; ligule a rim only. Raceme 10-30 cm long; spikelets 0.5-1 cm long, oblong, glabrous, sessile. Lower glume 3 x 0.5 mm, 1-nerved, keeled; upper glume 5-6 x 1 mm, notched below the apex on one side, 3-nerved. Flowers 10-16; lemma 3-4 x 1-2 mm, 4-lobed at apex, 3-awned; one median and two laterals; median one twice the length of laterals; palea 3 x 1 mm, scabrid along the keels. Anthers 1 mm long.

Ambalappara, *KJD 25523*

Fl. & Fr.: August-March

Distribution: Rare near small streams in Evergreen forests of Ambalappara.

GNETACEAE

GNETUM L., Mant. Pl. 18. 1767.

Gnetum edule (Willd.) Blume, Nov. Pl. Expos. 31. 1833. *Thoa edulis* Willd., Sp. Pl. 4: 477. 1805. *Gnetum ula* Brongn. in Duperr., Voy. Bot. 12. 1829; Gamble, Fl. Pres. Madras 1885(1304). 1936; Ansari, Fl. Kasaragod Div. 362. 1985; Ramach. & V.J. Nair, Fl. Cannanore Dist. 443. 1988; Vajr., Fl. Palghat Dist. 459. 1990.

Woody climbers. Leaves opposite, 10-18 x 5-9 cm, elliptic-ovate or oblong, coriaceous, acute, base rounded or acute; petiole to 1.5 cm. Panicles axillary arising from mature wood; bracts cupular; male strobilus to 5 cm long, bracteoles 2.5 mm; stamens 1, exserted; female strobilus to 7 cm long; ovary globose. Fruits ca 3 x 2 cm, globose.

Chavachi, *KJD 18703*

Fl. & Fr.: October-June

Distribution: Fairly common in Evergreen forests of Chavachi, Kariyenkappu, etc.

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