

STUDIES ON THE VASCULAR FLORA OF SULTAN'S BATTERY AND CHEDALETH FOREST RANGES, KOZHIKODE DISTRICT, KERALA

J. L. ELLIS, M. S. SWAMINATHAN AND M. CHANDRABOSE

Botanical Survey of India, Coimbatore

A B S T R A C T

This paper deals with all the vascular plants of Sultan's Battery and Chedaleth ranges, Kozhikode Dt., Kerala collected during the year 1964-65. The ranges lie between 8° & 12°N and 76° & 80°E. Various types of vegetation ranging from tropical evergreen, semi-evergreen, moist and dry deciduous to scrub are seen. Altogether 528 plants, spread over 87 families and 370 taxa are enumerated. From a careful study of literature and collections made earlier by others and presently kept in the herbarium of the Southern Circle, Botanical Survey of India, twelve new records for the area are discovered.

INTRODUCTION

The two ranges dealt with in this paper come under South Wynad division. The ranges lie between 8° & 12° N and 76° & 80° E with altitudes ranging from 725 to 1267 m. The ranges occupy an area of approximately 20 sq. km. The general configuration of the area is a flat plateau with 2-3 hillocks. There is a road leading from Sultan's Battery to Pavagada situated near the Kerala-Mysore border. This road stretches across 20 km of the forests, meandering through Kuppadi, Chedaleth and Waterfalls (Map).

Botanically this area remained underexplored. Some collections of Rangachari in the beginning of this century are seen from the herbarium sheets kept in the Southern Circle Herbarium. Gamble and Fischer report a few plants from this area in their "*Flora of the Presidency of Madras*" (1915-36). From the available literature no taxonomic work other than some ecological studies by Chandrasekharan (1962) seems to have been done. Therefore, four exploration tours have been conducted in these ranges to cover all the seasons of the year 1964-65. The total number of plants collected is 528 spread over 87 families. Altogether 370 taxa have been collected; most of these have been identified and deposited in the herbarium of the Southern Circle, Coimbatore (MH); 46 numbers are undetermined.

GEOLOGY AND SOIL

The rock bed is mainly of gneiss. The main constituents of gneiss are felspar, quartz and biotite; lateritic soil is found near Pavagada. The top-most layer in most of the areas is of red loam. Under the tall trees and in shady places humus is

encountered. Near streams the soil is of sandy type. In poorer forests the soil tends to be gravelly.

CLIMATE

In general the climate is pleasantly cool even during March-May. The temperature varies roughly between 20°-35° C in different seasons. There is sporadic rainfall in March-April. S. W. Monsoon becomes active in June-July, and continues up to September, though less pronounced after July. The N. E. Monsoon, beginning by about the end of October, lasts till the end of November. The average annual rainfall is about 195 cm.

A strong wind from east starts about the beginning of November and ends by April. During this period there is a tendency for forest fires to spread.

VEGETATION

As we move from Sultan's Battery towards Pavagada, a distance of 20 km, we pass from an area where the rainfall is higher, the soil rich red-loamy with plenty of humus towards an area where the rainfall gradually decreases and the soil is of the red-gravelly type without humus. The vegetation in Pavagada is again affected by the frequent forest fires; the top layer due to soil erosion has become poor. In March-April 1964, there was a severe conflagration near Kerala-Mysore border which lasted for several days.

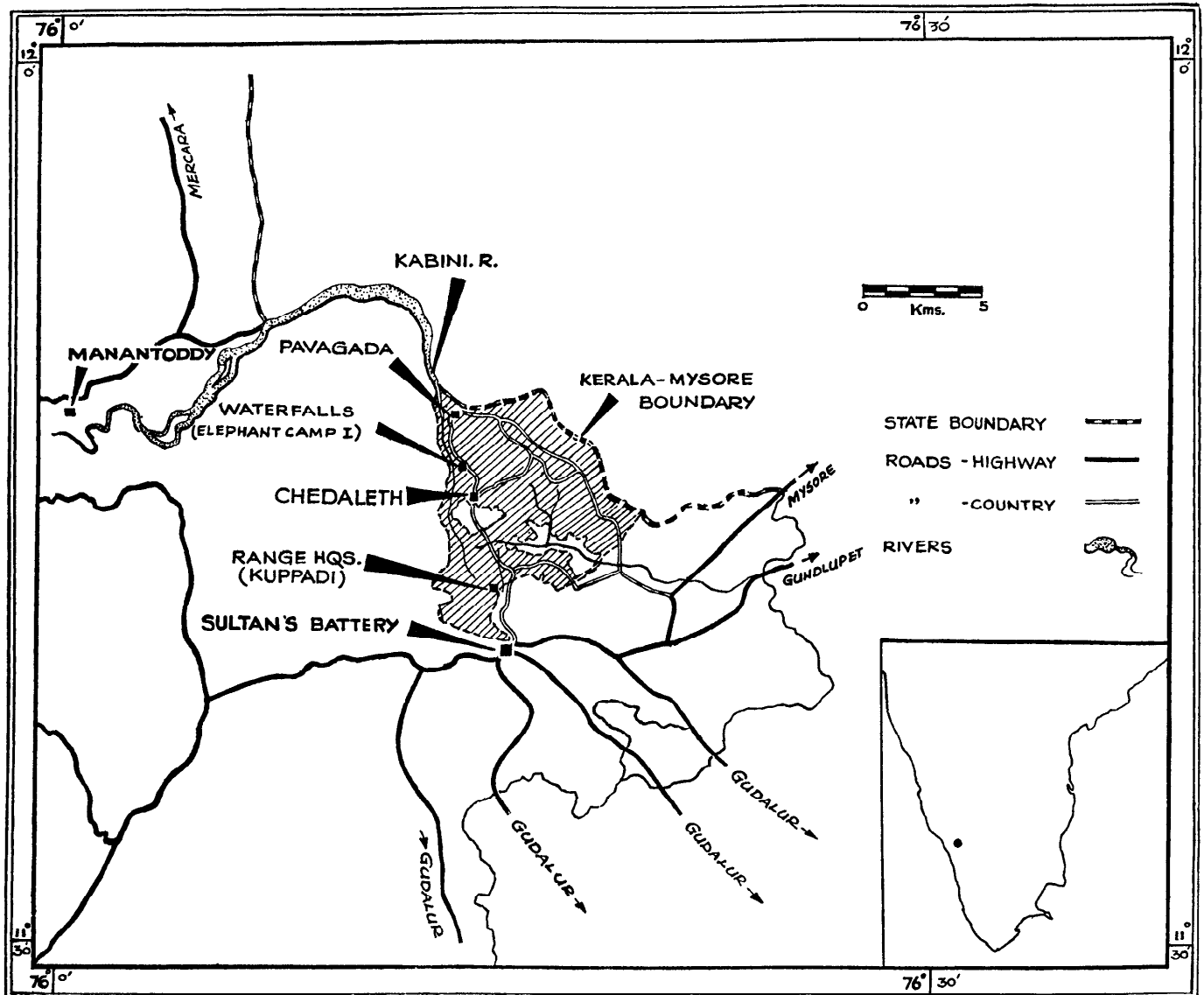
In Chedaleth and Kuppadi ranges some spots have been set aside for rice cultivation. The Forest Department has conducted felling operations for cultivation of economic plants like *Tectona grandis*, *Evodia lunuankenda* and *Bombax ceiba*.

In these forests we see all types of vegetation—tropical rain forest, semi-evergreen, moist deciduous, dry deciduous and scrub. For a thorough

botanical survey of these ranges, it is desirable to divide the area into many artificial blocks: (i) Sultan's Battery, (ii) Kuppadi, (iii) Chedalet, (iv) Pambara, (v) Waterfalls and (vi) Pavagada and Mysore-Kerala border.

(i) *Sultan's Battery* : The vegetation of this area can be classified as tropical rain forest, though

near the road both deciduous and scrub forest taxa are seen. There are more or less 3 layers of vegetation. The top layer is about 45 m. Some of the plants of this layer are: *Bischofia javanica*, *Lannea coromandelica*, *Litsea coriacea*, *L. laevigata*, *Machilus macrantha*, *Olea dioica*, *Schleichera oleosa*, etc. In exposed portions clumps of *Bambusa arundina-*



Map showing a portion of Kozhikode District, Kerala

cea are present; since its flowering in 1962-63, the plants have died, and apparently there is no natural regeneration.

The middle layer consists of the following: *Acronychia pedunculata*, *Antidesma menasu*, *Aporosa lindleyana*, *Bridelia scandens*, *Careya arborea*, *Cassia fistula*, *Clerodendrum viscosum*, *Cipadessa*

baccifera, *Flacourtia indica*, *Meliosma simplicifolia*, *Mussaenda laxa*, *Meyna laxiflora*, *Xylosma latifolia*, etc.

From the ground layer the following ferns have been collected: *Adiantum philippense*, *Angiopteris evecta*, *Cyclosorus extensus*, *Leptochilus decurrens*, etc. *Psilotum nudum* has been collected on a tree

trunk. *Disperis neilgherrensis*, a small beautiful orchid, occurs commonly here. Some of the epiphytes of this region include: *Dendrobium haemoglossum*, *Pholidota imbricata*, *Remusatia vivipara*, etc. Climbers of this area are: *Gnetum ula*, *Jasminum ritchei*, *Piper nigrum*, *P. hymenophyllum*, *Smilax perfoliata*, *Tragia involucrata*, etc.

(ii) *Kuppadi*: This is a small village about 8 km from Sultan's Battery, on way to Pavagada, with a timber depot managed by the Forest Department. The forest around this place is much denuded and only a few patches of trees are left intact. Grasses and *Lantanas* abound and make the area almost impenetrable. Various other plants have made their entrance, among which *Gouania microcarpa*, *Wendlandia thyrsoides* are conspicuous. Here again plantations of *Bombax ceiba* and *Evodia lunuankenda* are raised by the Forest Department for commercial purposes.

(iii) *Chedaleth*: This is a reserve forest left almost intact. It is situated between Kuppadi and Chedaleth villages. The growth of plants, however, is rather stunted when compared with Sultan's Battery forest. There appears to be some disturbance in the vegetation due to the ravages of elephants and buffaloes. The vegetation of this part can be classified as semi-evergreen or moist deciduous. There is a sure sign of its becoming dry deciduous because of soil erosion and other biotic factors.

There is no definite demarcation of different layers of vegetation. In some of the areas, where streams flow, there are dense vegetations of *Pandanus furcatus*. Near these marshy regions there is a thick vegetation of *Schumannianthus virgatus*. In the shady regions of these marshy places, *Alpinia malaccensis* thrives well. *Curcuma neilgherrensis* and *Zingiber wightianum* are common throughout. Some of the evergreen plants occurring towards north are: *Artocarpus hirsuta*, *Cinnamomum iners*, *Linociera malabarica*, *Prunus ceylanica*, etc. The very thick undershrubs of this region comprise *Nilgiranthus heyneanus* intermixed with *Coffea travancorensis* and *Chassalia ophioxylodes*, *Ervatamia heyneana*, etc. The ground floor is conspicuously devoid of grasses.

Moving from the road towards the interior part of this forest, a portion of the forest at Nilanjara is cleared for rice cultivation. Some of the marshy or aquatic plants are: *Colocasia esculenta*, *Eriocaulon quinquangulare*, *Lindernia ana-*

gallis, *Ludwigia hyssopifolia*, *Monochoria vaginalis* and a parasitic plant, *Christisonia tubulosa*, populations of *Dryopteris oethodes*, *Cyclosorus extensus* and a marshy tree, *Syzygium malabaricum*. There are a few plants of *Psidium guajava*, which were previously cultivated. *Symplocos laurina* grows abundantly bordering the marshy place. *Gardneria ovata*, *Schefflera venulosa*, etc. are some of the climbers.

In some cleared parts of this forest, we find clumps of *Bambusa arundinacea*; they are gregarious. During monsoon months, *Ophioglossum reticulatum* grows in areas where the leaves of bamboo have fallen. During summer months, *Zeuxine longilabris* is a common orchid, again amidst fallen leaves of bamboos. *Radermachera xylocarpa* is rather rare; *Emblia officinalis* is common. In July-August, *Aeginetia indica* is a very common parasite.

(iv) *Pambara*: This is situated towards west of the Chedaleth village, and most of it is set aside for coffee plantation, and some for privately managed teak plantations. The rest of the area has a much disturbed vegetation; there is an aggressive encroachment of *Lantana indica*, deep inside the forest. *Costus speciosus* and *Schumannianthus virgatus* are common along a stream. *Machilus macrantha* and *Meliosma simplicifolia* are some of the dominant trees. In exposed regions, near the stream, *Hibiscus furcatus* is a thick scandent shrub; *Triumfetta pilosa* grows near. Other plants of this area include: *Acronychia pedunculata*, *Celastrus paniculata*, *Cyclosorus extensus*, *Evodia lunuankenda*, *Elaeocarpus tuberculatus*, *Lannea coromandelica*, *Lastrea oethodes*, *Naravelia zeylanica*, *Pteridium aquilinum*, *Pteris quadriaurita*, etc.

(v) *Waterfalls (Elephant Camp I)*: A tributary of Kabini river flows in this part of the forest, and this can be taken as the limit for semi-evergreen and moist deciduous types of forests. From here towards north, dry deciduous, sometimes moist deciduous types of forests predominate. Patches of evergreen occur one kilometre before reaching the Waterfalls. Some of the dominant species of this evergreen patch are: *Casuarina elliptica*, *Glochidion tomentosum*, *Hydnocarpus laurifolia*, *Machilus macrantha*, *Mangifera indica*, and higher up on the hillocks, *Asplenium formosum*, etc. Near Waterfalls the common plants are: *Asplenium laciniatum*, *Callicarpa tomentosa*, *Kalanchoë laciniata*, *Leucostegia immersa*, *Pleopeltis membranacea*, etc.

This river falls to a depth of about 15 m, wherein on the rocks or near to, the following plants have been collected: *Coffea travancorensis*, *Epithema carnosum* var. *hispidum*, *Fleurya interrupta*, *Microlepia speluncae* var. *hirta*, *Peperomia dindigulensis*, *Trichomanes bipunctatum*, etc. *Epipogium roseum*, a very interesting saprophytic orchid growing on decaying bamboos, and *Diploclisia glaucescens*, a giant climber, have also been collected. The other liana of this area is *Entada pursaetha*.

(vi) *Pavagada and Kerala-Mysore border*: This area is approachable by a road which passes through the teak plantations; the undershrubs in these teak plantations are the same as those of Pavagada. In Pavagada, the vegetation may be classified as dry deciduous type. There are frequent fires in the forest. This area is occupied dominantly by grasses which include: *Alloteropsis cimicina*, *Cymbopogon* sp., *Chionachne koenigii*, *Digilaria griffithii*, *Imperata cylindrica* var. *koenigii*, *Setaria pallidifusca*, *Themeda tremula*, etc. *Oryza granulata*, a wild rice, is a very common plant during the monsoon. There seems to be an association of *Lagerstroemia parviflora*, *Schleichera oleosa* and *Terminalia crenulata*, intermixed with *Tectona grandis*. *Emblica officinalis*, *Gardenia lucida*, *Mitragyna parviflora*, *Stereospermum personatum* are the dominant trees, including some herbs, shrubs and climbers like *Ampelocissus tomentosa*, *Argyreia speciosa*, *Casearia elliptica*, *Glochidion tomentosum*, *Grewia abutifolia*, *Holarrhena antidysenterica* and *Leea edgeworthii*. *Rauvolfia serpentina* and *Ludwigia peruviana* have been collected near Kabini tributary. *Bambusa arundinacea* forms thick sporadic clumps; but since its flowering during 1962-63 the plants show signs of decadence. Near the Kerala-Mysore border the following plants are common: *Antidesma diandrum*, *Chionachne koenigii*, *Eulophia nuda*, *Globba bulbifera*, *Liparis prazeri*, *Peristylis plantagineus*, *Scilla hyacinthina*, etc.

Some of the parasitic plants collected in all these forests are: *Dendrophthoe falcata*, *Helixanthera wallichiana*, *Viscum angulatum*, etc.

From the account given above it becomes clear that it is rather difficult to single out any type of vegetation as a typical one, for there are intergrades of all these types of forests. Forest fires render the topmost layer of the soil liable to erosion; Elephants and wild buffaloes uproot some of the plants. The evergreen patches near Cheda-

leth, Waterfalls and Sultan's Battery need all the protection from the ravages of these fires and biotic factors.

ENUMERATION

In the following enumeration the system of Bentham and Hooker, with some delimitations of families by Hutchinson (1959), is followed, and all the field numbers quoted are of Ellis. An asterisk mark before a name indicates new distribution for the area. Every attempt has been made to bring nomenclature up to date. The name of the taxon is followed by the place of collection, altitude, phenological data, date and field number.

PSILOTACEAE

Psilotum nudum (Linn.) Griseb.

Sultan's Battery, 900 m, 12-8-1964, 19931.

LYCOPODIACEAE

Lycopodium setaceum Buch.-Ham.

Sultan's Battery, 900 m, 12-8-1964, 19935.

OPHIOGLOSSACEAE

Ophioglossum reticulatum Linn.

Chedaleth, 900 m, 13-8-1964, 19968; Chedaleth, 900 m, 10-5-1965, 24053.

SCHIZAEACEAE

Lygodium flexuosum Sw.

Chedaleth, 900 m, 18-8-1964, 20468.

HYMENOPHYLLACEAE

Trichomanes bipunctatum Poir.

Waterfalls, Chedaleth, 900 m, 17-8-1964, 20450.

POLYPODIACEAE (*sensu lato*)

Adiantum philippense Linn.

Sultan's Battery, 900 m, 12-8-1964, 19936.

Alsophila glabra Bl.

Chedaleth, 950 m, 10-5-1965, 24042.

Angiopteris evecta Hoffm.

Sultan's Battery, 950 m, 10-2-1964, 18655.

Asplenium formosum Willd.

Waterfalls, Chedaleth, 900 m, 17-8-1964, 20447.

A. laciniatum D. Don

Kurichiyat, Chedaleth, 900 m, 17-8-1964, 20442.

Bolbitis virens (Wall.) Schott

Sultan's Battery, 860 m, 9-5-1965, 24032.

Cyclosorus extensus (Bl.) Ching

Sultan's Battery, 900 m, 12-8-1964, 19934 B.

Dryopteris octhodes (O. Ktze.) C. Chr.

Sultan's Battery, 900 m, 11-2-1964, 18668; Sultan's Battery, 900 m, 12-8-1964, 19934 A.

Grammitis attenuata O. Ktze.

Kuppadi, 890 m, 6-2-1964, 18565.

Lastrea filixmas Presl var. **cochleata** D. Don

Sultan's Battery, 890 m, 29-10-1965, 25763.

Leptochilus decurrens Bl.

Kuppadi, 900 m, 6-2-1964, 18542; Sultan's Battery, 860 m, 9-5-1965, 24020.

Leucostegia immersa (Wall.) Presl

Kurichiyat, Chedaleth, 900 m, 17-8-1964, 20443.

Microlepia speluncae Linn. var. **hirta** Bedd.

Waterfalls, Chedaleth, 900 m, 17-8-1964, 20457.

Microsorium punctatum (Linn.) Copel.

Sultan's Battery, 950 m, 8-2-1964, 18614; Chedaleth, 975 m, 10-5-1965, 24035.

Nephrodium aridum D. Don

Kuppadi, 890 m, 6-2-1964, 18561.

Nephrolepis cordifolia (Linn.) Presl

Chedaleth, 900 m, 18-8-1964, 20479.

Pellaea concolor Lang. & Fisch.

Waterfalls, Chedaleth, 840 m, 11-5-1965, 24055.

Phymatodes nigrescens (Bl.) J. Sm.

Sultan's Battery, 950 m, 8-2-1964, 18612; Chedaleth, 900 m, 12-8-1964, 19956.

Pleopeltis membranacea Walh.

Kurichiyat, Chedaleth, 900 m, 17-8-1964, 20444.

Pteridium aquilinum (Linn.) Kuhn

Sultan's Battery, 950 m, 9-2-1964, 18641.

Pteris pellucida Presl

Kuppadi, 900 m, 6-2-1964, 18529.

P. quadriaurita Retz.

Kuppadi, 900 m, 6-2-1964, 18533.

RANUNCULACEAE

Clematis gouriana Roxb. ex DC.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18639.

Naravelia zeylanica (Linn.) DC.

Pambara, 900 m, in buds, 27-10-1965, 25718.

MENISPERMACEAE

Cissampelos pareira Linn.

Kerala-Mysore border, Pavagada, 900 m, in fruits, 15-8-1964, 20426.

Cyclea peltata Diels

Kuppadi, 890 m, in fruits, 6-2-1964, 18569.

Diploclisia glaucescens Diels

Waterfalls, 840 m, in flowers, 11-5-1965, 24058.

FLACOURTIACEAE

Flacourtia indica (Burn. f.) Merr.

Chedaleth, 975 m, in fruits, 10-5-1965, 24037.

Hydnocarpus laurifolia (Dennst.) Sleumer

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18673; near Waterfalls, 840 m, in fruits, 11-5-1965, 24064.

Xylosma latifolium Hook. f. & Thoms.

Sultan's Battery, 900 m, in fruits, 12-8-1964, 19925.

PITTOSPORACEAE

Pittosporum floribundum Wt. & Arn.

Sultan's Battery, 900 m, in fruits, 11-2-1964, 18683.

POLYGALACEAE

Polygala javana DC.

Kerala-Mysore border, Pavagada, 725 m, in flowers and fruits, 12-5-1965, 24079.

CARYOPHYLLACEAE

Drymaria cordata Willd.

Way to Pavagada, Kerala-Mysore border, 750 m, in flowers, 28-10-1965, 25754.

MALVACEAE

Bombax ceiba Linn.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18635.

Hibiscus furcatus Roxb.

Kuppadi, 890 m, in flowers, 6-2-1964, 18559.

H. lobatus (Murr.) O. Ktze.

Pavagada, 690 m, in flowers, 28-10-1965, 25741.

Sida acuta Burm. f.

Waterfalls region, Chedaleth, 900 m, in flowers and fruits, 17-8-1964, 20455.

Urena lobata Linn.

Kuppadi, 890 m, in flowers, 6-2-1964, 18554.

U. lobata Linn. subsp. **sinuata** (Linn.) Borss. var. **sinuata**

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18671.

STERCULIACEAE

Helicteres isora Linn.

Kuppadi, 890 m, in flowers, 6-2-1964, 18557.

Melochia corchorifolia Linn.

Paddy fields, Chedaleth, 900 m, in flowers, 19-8-1964, 20492.

TILIACEAE

Grewia abutifolia Vent. ex Juss.

Waterfalls region, Chedaleth, 840 m, in flowers, 11-5-1965, 24060; Pavagada, 700 m, in fruits, 28-10-1965, 25751.

G. disperma Rottl. ex Spreng.

Kuppadi, 900 m, in fruits, 6-2-1964, 18536; Chedaleth, 900 m, in buds, 13-8-1964, 19953; Pambara, 900 m, in flowers and fruits, 27-10-1965, 25711.

Grewia hirsuta Vahl

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20416.

Triumfetta pilosa Roth

Kuppadi, 890 m, in fruits, 6-2-1964, 18556; Pambara, 900 m, in flowers, 27-10-1965, 25722.

ELAEocarpaceae

Elaeocarpus tuberculatus Roxb.

Pambara, 900 m, in fruits, 13-5-1965, 24092.

GERANIACEAE

Biophytum reinwardtii (Zucc.) Edgew. et Hook. f.

Chedaleth, 900 m, in flowers, 18-8-1964, 20470.

Impatiens chinensis Linn.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18615; Chedaleth, 900 m, in flowers, 29-10-1965, 25762.

I. kleinii Wt. & Arn.

Kerala border, Pavagada, 900 m, in flowers, 15-8-1964, 20428; Pambara, 900 m, in flowers, 18-8-1964, 20478.

OXALIDACEAE

Oxalis corniculata Linn.

Chedaleth, 900 m, in flowers and fruits, 20-8-1964, 20496.

RUTACEAE

Acronychia pedunculata (Linn.) Miq.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19924.

Evodia lunuankenda (Gaertn.) Merr.

Chedaleth, 900 m, in fruits, 18-8-1964, 20469; Pambara, 900 m, in fruits, 27-10-1965, 25714.

Glycosmis mauritiana (Lamk.) Tanaka

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18602; Waterfalls region, 900 m, in buds, 17-8-1964, 20445.

Hesperethusa crenulata (Roxb.) Roem.

Sultan's Battery, 890 m, in fruits, 9-5-1965, 24001.

Toddalia asiatica Lamk. var. **floribunda** Gamble

Sultan's Battery, 950 m, in fruits, 8-2-1964, 18610; way to Sultan's Battery, 900 m, in buds, 29-10-1965, 25756.

BURSERACEAE

Garuga pinnata Roxb.

Pavagada, 730 m, in fruits, 12-5-1965, 24070.

MELIACEAE

Cipadessa baccifera (Roth) Miq.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18630; Sultan's Battery, 900 m, in fruits, 12-8-1964, 19942;

Sultan's Battery, 890 m, in flowers, 9-5-1965, 24003; way to Pavagada, Pavagada, 900 m, in fruits, 28-10-1965, 25736.

Trichilia connaroides (Wt. & Arn.) Benth.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18632; Sultan's Battery, 900 m, in fruits, 12-8-1964, 19938; Chedaleth, 925 m, in fruits, 13-5-1965, 24097; Elephant Camp I, Chedaleth region, 850 m, in fruits 27-10-1965, 25735.

CELASTRACEAE

Celastrus paniculata Willd.

Odapallum, Chedaleth, 900 m, in fruits, 14-8-1964, 19975; Chedaleth, 975 m, in flowers, 10-5-1965, 24052; Chedaleth, 925 m, in buds, 13-5-1965, 24096.

RHAMNACEAE

Gouania microcarpa DC.

Sultan's Battery, 850 m, in flowers, 29-10-1965, 25775.

Zizyphus rugosa Lamk.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18647; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24025.

VITACEAE

Cissus discolor Bl.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19921.

Leea edgeworthii Sant.

Pavagada, 900 m, in flowers and small fruits, 15-8-1964, 20406; Pavagada, 900 m, in fruits, 28-10-1965, 25738.

L. indica (Burm. f.) Merr.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18652.

SAPINDACEAE

Allophylus rheedii Radlk.

Chedaleth, 900 m, in fruits, 13-8-1964, 19952; Sultan's Battery, 890 m, in buds, 9-5-1965, 24007.

Euphoria longana Lamk.

Waterfalls region, Chedaleth, 900 m, in fruits, 17-8-1964, 20458.

Schleichera oleosa (Lour.) Oken

Pavagada, 900 m, in buds, 13-2-1964, 18687; near the School, Kuppadi, 900 m, in fruits, 19-8-1964, 20489; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24024.

SABIACEAE

Meliosma simplicifolia Walp.

Kuppadi, 890 m, in flowers, 6-2-1964, 18563; Sultan's Battery, 950 m, in flowers, 8-2-1964, 18617; Pambara, 900 m, in fruits, 13-5-1965, 24093.

ANACARDIACEAE

Holigarna ferruginea March.

Elephant Camp I, Chedaleth, 840 m, in fruits, 11-5-1965, 24063.

Lannea coromandelica (Houtt.) Merr.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18645; Pambara, 900 m, in fruits, 13-5-1965, 24091.

Mangifera indica Linn.

Pavagada, 780 m, in flowers, 7-2-1964, 18584; near Elephant Camp I, Chedaleth, 840 m, in fruits, 11-5-1965, 24066.

PAPILIONACEAE

Butea monosperma (Lamk.) Taub.

Kuppadi, 900 m, in flowers and fruits, 11-2-1964, 18684.

Crotalaria fulva Roxb.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18631; Sultan's Battery, 820 m, in flowers, 29-10-1965, 25770.

C. laevigata Lamk.

Elephant Camp I, Chedaleth, 850 m, in flowers, 27-10-1965, 25728.

C. quinquefolia Linn.

Rice fields, Chedaleth, 900 m, in flowers, 19-8-1964, 20491.

C. walkeri Arn.

Sultan's Battery, 950 m, in flowers and fruits, 9-2-1964, 18637; Elephant Camp I, Chedaleth, 850 m, in flowers, 27-10-1965, 25727.

Cylista scariosa Roxb.

Kuppadi, 890 m, in flowers, 6-2-1964, 18555.

Dalbergia sissooides Grah.

Sultan's Battery, 890 m, in fruits, 9-5-1965, 24029; Sultan's Battery, 900 m, in fruits, 29-10-1965, 25772.

Desmodium heterophyllum DC.

Paddy fields, Chedaleth, 900 m, in flowers, 19-8-1964, 20494.

D. ormocarpoides DC.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20429.

D. polycarpum DC.

Sultan's Battery, 900 m, in flowers and fruits, 14-2-1964, 18691.

D. pulchellum Benth.

Pavagada, 780 m, in fruits, 7-2-1964, 18578.

D. triangulare (Retz.) Merr. var. **congestum** (Prain) Sant.

Chedaleth, 900 m, in buds, 20-8-1964, 20498; Pavagada, 680 m, in flowers and fruits, 28-10-1965, 25740.

Dolichos falcatus Klein

Kuppadi, 890 m, in flowers and fruits, 6-2-1964,

18549; Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18606.

Glycine javanica Linn.

Kuppadi, 890 m, in fruits, 6-2-1964, 18568; Sultan's Battery, 950 m, in fruits, 8-2-1964, 18601.

Indigofera pulchella Roxb.

Pavagada, 900 m, in flowers, 13-2-1964, 18688.

I. wightii Grah.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20415.

Moghania bracteata (Roxb.) Linn.

Pavagada, 700 m, in flowers, 28-10-1965, 25748.

M. grahamiana (Wt. & Arn.) O. Ktze.

Pavagada, 780 m, in flowers, 7-2-1964, 18580.

Phaseolus sublobatus Roxb.

Kuppadi, 890 m, in flowers, 6-2-1964, 18558.

Pterocarpus marsupium Roxb.

Chedaleth, 900 m, in flowers, 20-8-1964, 20500.

Smithia geminiflora Roth

Chedaleth, 900 m, in flowers, 7-2-1964, 18590.

Sophora glauca Lesch.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18634; Chedaleth, 900 m, in fruits, 13-8-1964, 19959.

CAESALPINIACEAE

Bauhinia racemosa Lamk.

Chedaleth, 975 m, in flowers, 10-5-1965, 24051.

Caesalpinia mimosoides Lamk.

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18604.

Cassia fistula Linn.

Kerala-Mysore border, Pavagada, 900 m, in fruits, 15-8-1964, 20417; Chedaleth, 975 m, in flowers, 10-5-1965, 24036.

C. hirsuta Linn.

Way to Pavagada, Pavagada, 700 m, in flowers, 28-10-1965, 25753.

Piliostigma malabaricum (Roxb.) Benth.

Kerala-Mysore border, Pavagada, 900 m, in buds, 15-8-1964, 20430.

MIMOSACEAE

Acacia pennata (Linn.) Willd.

Way to Sultan's Battery, Sultan's Battery, 900 m, in flowers, 19-8-1964, 20485.

A. torta (Roxb.) Craib

Kerala border, Pavagada, 900 m, in fruits, 15-8-1964, 20433.

Albizia odoratissima (Linn. f.) Benth.

Sultan's Battery, 900 m, in fruits, 12-8-1964, 19923.

ROSACEAE

Prunus ceylanica (Wt.) Miq.

Way to Sultan's Battery, Chedaleth, 900 m, in buds and fruits, 29-10-1965, 25759.

***Rubus micropetalus** Gardn.

Chedaleth, 925 m, in fruits, 13-5-1965, 24102.

GRASSULACEAE

Kalanchoë floribunda Wt. & Arn.

Chedaleth, 900 m, in flowers, 14-2-1964, 18690.

COMBRETACEAE

Terminalia crenulata Roth

Elephant Camp I, Chedaleth, 850 m, in fruits, 27-10-1965, 25733.

MYRTACEAE

Syzygium malabaricum (Bedd.) Gamble

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18620; Chedaleth, 950 m, in fruits, 10-5-1965, 24038.

S. zeylanicum Wt.

Chedaleth, 900 m, in fruits, 13-8-1964, 19966.

LECYTHIDACEAE

Careya arborea Roxb.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18625; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24008.

MELASTOMATACEAE

Osbeckia octandra DC.

Sultan's Battery, 890 m, in flowers, 29-10-1965, 25766.

O. wynaadensis C. B. Cl.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18623.

LYTHRACEAE

Lagerstroemia lanceolata Wall.

Pavagada, 725 m, in flowers, 12-5-1965, 24068.

Rotala rotundifolia Kochne

Chedaleth, 900 m, in flowers, 7-2-1964, 18588.

ONAGRACEAE

Ludwigia hyssopifolia (G. Don) Exell

Nilanjara, Chedaleth, 900 m, in flowers and fruits, 14-8-1964, 19996.

L. octovalvis (Jacq.) Raven subsp. **octovalvis**

Sultan's Battery, 900 m, in flowers and fruits, 11-2-1964, 18672.

L. peruviana (Linn.) Hara

Pavagada, 780 m, in flowers and fruits, 7-2-1964, 18572; Pambara, 900 m, in flowers and fruits, 18-8-1964, 20475.

SAMYDACEAE

***Casearia elliptica** Willd.

Sultan's Battery, 980 m, in buds, 10-2-1964, 18660; Kerala-Mysore border, Pavagada, 725 m, in fruits, 12-5-1965, 24078.

CUCURBITACEAE

Diplocyclos palmatus (Linn.) C. Jeffrey

Chedaleth, 900 m, in flowers, 18-8-1964, 20471.

Momordica dioica Roxb.

Kurichiyat, Chedaleth, 900 m, in flowers and fruits, 17-8-1964, 20460; way to Sultan's Battery, Sultan's Battery, 900 m, in flowers, 19-8-1964, 20484.

Mukia leiosperma Wt.

Pambara, 900 m, in flowers, 18-8-1964, 20482.

M. maderaspatana (Linn.) M. Roem

Pavagada, 780 m, in flowers and fruits, 7-2-1964, 18575.

Solena heterophylla Lour.

Pavagada, 730 m, in flowers, 12-5-1965, 24072.

Trichosanthes bracteata (Lamk.) Voigt var. **tomentosa** Heyne *emend.* Chakrav.

Pambara, 900 m, in flowers, 18-8-1964, 20474.

Zehneria angulata (Chakrav.) Ellis, comb. nov.

Melothria angulata Chakrav. Journ. Bombay nat. Hist. Soc. 50 : 899, 1952.

Kerala-Mysore border, 725 m, in fruits, 12-5-1965, 24075.

Z. maysorensis (Wt. & Arn.) Arn.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20425.

Z. thwaitesii (Schweinf.) C. Jeffrey

Pambara, 900 m, in flowers, 27-10-1965, 25721.

BEGONIACEAE

Begonia malabarica Lamk.

Waterfalls region, Chedaleth, 900 m, in flowers, 17-8-1964, 20453.

UMBELLIFERAE

Hydrocotyle javanica Thunb.

Sultan's Battery, 850 m, in fruits, 29-10-1965, 25774.

Pimpinella monoica Dalz.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20436.

ARALIACEAE

Schefflera venulosa Harms.

Sultan's Battery, 890 m, in buds and fruits, 9-5-1965, 24014.

CAPRIFOLIACEAE

Viburnum acuminatum Wall.

Sultan's Battery, 950 m, in buds, 8-2-1964, 18607 ; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24012 ; Way to Sultan's Battery, 900 m, in flowers and fruits, 29-10-1965, 25757.

RUBIACEAE

Borreria ocymoides DC.

Chedaleth, 900 m, in flowers, 18-8-1964, 20472 ; Sultan's Battery, 890 m, in flowers, 29-10-1965, 25767.

Chasalia ophioxylodes (Wall.) Craib.

Sultan's Battery, 900 m, in fruits, 12-8-1964, 19927 ; Chedaleth, 975 m, in flowers, 10-5-1965, 24033.

Coffea travancorensis Wt. & Arn.

Waterfalls region, Chedaleth, 900 m, in fruits, 17-8-1964, 20456 ; Waterfalls, 840 m, in buds, 11-5-1965, 24056.

Exallage auricularia (Linn.) Bremek.

Pavagada, 900 m, in flowers, 15-8-1964, 20404 ; Marshy area, Chedaleth, 950 m, in flowers, 10-5-1965, 24044.

Knoxia sumatrensis (Retz.) DC.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20420 ; 700 m, in flowers, 28-10-1965, 25750.

Meyna laxiflora Robyns

Sultan's Battery, 890 m, in flowers and fruits, 9-5-1965, 24026.

Mitragyna parvifolia Korth.

Pavagada, 725 m, in flowers, 12-5-1965, 24086.

Mussaenda laxa (Hook. f.) Hutch.

Sultan's Battery, 900 m, in flowers and fruits, 12-8-1964, 19944.

Ophiorrhiza mungos Linn.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19945.

Pavetta indica Linn.

Sultan's Battery, 900 m, in fruits, 12-8-1964, 19928.

P. indica Linn. var. **tomentosa** (Roxb.) Hook. f.

Sultan's Battery, 890 m, in flowers, 9-5-1965, 24018 ; Pavagada, 700 m, in fruits, 28-10-1965, 25747.

Rubia cordifolia Linn.

Kuppadi, 890 m, in fruits, 6-2-1964, 18548 ; Sultan's Battery, 900 m, in flowers, 12-8-1964, 19919 ; Pambara, 900 m, in flowers, 27-10-1965, 25720.

Wendlandia thyrsoides (Roem. & Schult.) Steud.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18625.

Xeromphis spinosa (Thunb.) Keay

Sultan's Battery, 950 m, in fruits, 10-2-1964, 18646 ; Sultan's Battery, 890 m, in flowers, 9-5-1965, 24011.

X. uliginosa (Retz.) Mahesh.

Pavagada, 780 m, in fruits, 7-2-1964, 18570 ; Pavagada, 750 m, in fruits, 28-10-1965, 25745.

COMPOSITAE

Adenostemma lavenia (Linn.) O. Ktze.

Chedaleth, 900 m, in flowers, 29-10-1965, 25760.

Ageratum conyzoides Linn.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18667.

Artemisia nilagarica (C.B.Cl.) Pamp.

Sultan's Battery, 900 m, in flowers and fruits, 11-2-1964, 18675.

Bidens pilosa Linn.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20438.

Blumea lanceolaria (Roxb.) Druce. var. **spectabilis** (DC.) Randeria

Kuppadi, 900 m, in flowers, 6-2-1964, 18535.

B. malabarica Hook. f.

Kuppadi, 900 m, in flowers, 6-2-1964, 18531.

B. mollis (D. Don) Merr.

Kuppadi, 900 m, in flowers, 6-2-1964, 18528.

Conyza ambigua DC.

Pavagada, 780 m, in flowers, 7-2-1964, 18571.

Cyathocline purpurea (D. Don) O. Ktze.

Pavagada, 780 m, in flowers, 7-2-1964, 18582 ; Chedaleth, 900 m, in flowers, 29-10-1965, 25761.

Emilia sonchifolia DC.

Pambara, 900 m, in flowers, 18-8-1964, 20477.

Erechthites valerianifolia DC.

Pambara, 900 m, in flowers, 18-8-1964, 20473.

Laggera pterodonta Benth.

Sultan's Battery, 900 m, in flowers, 14-2-1964, 18698.

Siegesbeckia orientalis Linn.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20440 ; Pambara, 900 m, in flowers, 27-10-1965, 25712.

Spilanthes acmella Murr.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18666.

Synedrella nodiflora Gaertn.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20439 ; Pavagada, 725 m, in flowers, 12-5-1965, 24084.

Vernonia cinerea Less.

Kuppadi, 890 m, in flowers, 6-2-1964, 18550.

Vernonia divergens Edgw.

Kuppadi, 900 m, in flowers, 6-2-1964, 18534.

LOBELIACEAE

Lobelia nicotianaefolia Heyne

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18633.

MYRSINACEAE

Ardisia solanacea (Poir.) Roxb.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18642 ; Sultan's Battery, 900 m, in fruits, 12-8-1964, 19929.

Embelia tsjeriam-cottam A. DC.

Sultan's Battery, 890 m, in flowers, 9-5-1965, 24006.

Maesa perrottetiana A. DC.

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18600.

SYMPOLOCACEAE

Symplocos laurina (Retz.) Wall. ex Rehd. & Wills.

Chedaleth, 900 m, in flowers, 13-8-1964, 19965.

OLEACEAE

Jasminum malabaricum Wt.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18686 ; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24010.

J. ritchiei C. B. Cl.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19943.

J. rottlerianum Wall.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18650.

Linociera malabarica Wall. ex G. Don

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18654 ; Sultan's Battery, 980 m, in flowers, 10-2-1964, 18659.

Olea dioica Roxb.

Kuppadi, 900 m, in flowers and buds, 6-2-1964, 18538 ; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24031 ; Sultan's Battery, 900 m, in fruits, 29-10-1965, 25771.

APOCYNACEAE

Ervatamia heyneana T. Cooke

Chedaleth, 900 m, in fruits, 13-8-1964, 19951 ; Chedaleth, 975 m, in flowers, 10-5-1965, 24048 ; Chedaleth, 925 m, in fruits, 13-5-1965, 24100.

Holarrhena antidysenterica (Roth) A. DC.

Pavagada, 730 m, in flowers, 12-5-1965, 24071.

Rauvolfia serpentina (Linn.) Benth. ex Kurz

Chedaleth, 900 m, in flowers, 13-8-1964, 19970 ; Pavagada, 725 m, in flowers, 12-5-1965, 24082.

ASCLEPIADACEAE

Asclepias curassavica Linn.

Chedaleth, 900 m, in flowers and fruits, 11-2-1964, 18662.

Hemidesmus indicus (Linn.) Schultes

Chedaleth, 900 m, in flowers, 18-8-1964, 20480.

LOGANIACEAE

Fagraea ceilanica Thunb.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19937.

Gardneria ovata Wall.

Marshy area, Kurichiyat, Chedaleth, 950 m, in flowers, 10-5-1965, 24043.

GENTIANACEAE

Canscora diffusa Br.

Pavagada, 780 m, in flowers, 7-2-1964, 18581.

BORAGINACEAE

Cynoglossum furcatum Wall.

Sultan's Battery, 900 m, in flowers, 14-2-1964, 18697.

CONVOLVULACEAE

Argyreia bracteata Choisy

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20413.

A. cuneata Ker-Gawl

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20414.

A. elliptica Choisy

Sultan's Battery, 900 m, in buds, 12-8-1964, 19918.

A. hirsuta Arn. var. **coacta** C. B. Cl.

Chedaleth, 900 m, in flowers, 18-8-1964, 20466.

Ipomoea angulata Lamk.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20441.

Merremia umbellata (Linn.) Hall. f.

Kuppadi, 900 m, in flowers, 6-2-1964, 18540.

SOLANACEAE

Physalis minima Linn.

Kurichiyat, Chedaleth, 900 m, in flowers and fruits, 17-8-1964, 20461.

Solanum giganteum Jacq.

Kuppadi, 900 m, in flowers and fruits, 6-2-1964, 18539 ; Odapallam, Chedaleth, 900 m, in flowers and fruits, 14-8-1964, 19976 ; Chedaleth, 925 m, in flowers and fruits, 13-5-1965, 24099.

S. indicum Linn.

Chedaleth, 900 m, in flowers and fruits, 20-8-1964, 20499.

Solanum torvum Sw.

Kuppadi, 900 m, in flowers and fruits, 6-2-1964, 18526; Sultan's Battery, 890 m, in flowers and fruits, 9-5-1965, 24002.

SCROPHULARIACEAE

Artanema sesamoides Benth.

Kuppadi, 890 m, in flowers, 6-2-1964, 18562.

Lindernia hyssopioides (Linn.) Haines

Chedaleth, 900 m, in flowers, 7-2-1964, 18589.

L. anagallis (Burm. f.) Pennell

Nilanjara-Chedaleth, 900 m, in flowers, 14-8-1964, 19984; Marshy area, Chedaleth, 950 m, in flowers, 10-5-1965, 24039.

Limnophila chinensis (Osbeck.) Merr.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18619.

L. rugosa (Roth) Merr.

Nilanjara, Chedaleth, 900 m, in flowers, 14-8-1964, 19986.

Scoparia dulcis Linn.

Chedaleth, 900 m, in flowers and fruits, 13-8-1964, 19972.

OROBANCHACEAE

Aeginetia indica Linn.

Chedaleth, 900 m, in flowers, 13-8-1964, 19957.

Christisonia tubulosa Hook. f.

Nilanjara, Chedaleth, 900 m, in flowers, 14-8-1964, 19988.

GESNERIACEAE

Epithema carnosum Benth. var. **hispida** C. B. Cl.

Waterfalls, 900 m, in flowers, 17-8-1964, 20452.

BIGNONIACEAE

Radermachera xylocarpa (Roxb.) K. Schum.

Sultan's Battery, 950 m, in flowers and fruits, 10-2-1964, 18656.

Stereospermum personatum (Hassk.) Chatt.

Chedaleth, 900 m, in fruits, 18-8-1964, 20465; Pavagada, 725 m, in fruits, 12-5-1965, 24080.

ACANTHACEAE

Asystasia chelonoides Nees var. **quadrangularis** C. B. Cl.

Sultan's Battery, 900 m, in flowers and fruits, 12-8-1964, 19932; Pavagada, 725 m, in flowers, 12-5-1965, 24087.

A. dalzelliana Sant.

Sultan's Battery, 900 m, in flowers and fruits, 10-2-1964, 18644.

Bremekampia neilgherryensis (Wt.) Sreem.

Kuppadi, 890 m, in flowers, 6-2-1964, 18547.

Eranthemum montanum Roxb.

Sultan's Battery, 900 m, in fruits, 11-2-1964, 18676.

Justicia diffusa Willd.

Pavagada, 780 m, in flowers and fruits, 7-2-1964, 18579; Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20431.

J. simplex D. Don

Chedaleth, 900 m, in flowers, 13-8-1964, 19967.

J. wynaadensis Heyne ex Nees

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18599.

Lepidagathis incurva D. Don var. **mucronata** C. B. Cl.

Kuppadi, 900 m, in flowers, 6-2-1964, 18544.

Nilgiranthus heyneanus (Nees) Bremek. var. **neesii** Bremek.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18592; Waterfalls, Chedaleth, in buds and fruits, 27-10-1965, 25729.

N. neilgherrensis (Bedd.) Bremek.

Waterfalls, Chedaleth, 850 m, in flowers, 27-10-1965, 25730.

Peristrophe bicalyculata (Retz.) Nees

Pavagada, 780 m, in flowers, 7-2-1964, 18587.

Phaulopsis dorsiflora (Retz.) Sant.

Pavagada, 780 m, in flowers, 7-2-1964, 18586.

Rhinacanthus nasuta (Linn.) Kurz

Kuppadi, 900 m, in flowers and fruits, 6-2-1964, 18530.

Rungia pectinata (Linn.) Nees

Kuppadi, 900 m, in flowers, 6-2-1964, 18543.

Thunbergia laevis Nees

Pavagada, 780 m, in flowers, 7-2-1964, 18573; Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20432.

VERBENACEAE

Callicarpa tomentosa (Linn.) Murray

Kuppadi, 900 m, in flowers, 6-2-1964, 18537; Waterfalls, Chedaleth, 900 m, in fruits, 17-8-1964, 20446.

Clerodendrum serratum (Linn.) Moon

Sultan's Battery, 900 m, in flowers and fruits, 12-8-1964, 19940.

C. viscosum Vent.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18598.

Gmelina arborea Roxb.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18678.

Lantana indica Roxb.

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20437.

Premna coriacea C. B. Cl.

Marshy area, Chedaleth, 950 m, in fruits, 10-5-1965, 24041.

Vitex altissima Linn. f.

Roadside, Sultan's Battery, 900 m, in fruits, 19-8-1964, 20488; Sultan's Battery, 890 m, in buds, 9-5-1965, 24004.

V. negundo Linn.

Sultan's Battery, 900 m, in flowers and fruits, 14-2-1964, 18696.

LABIATAE

Acrocephalus indicus (Burm. f.) O. Ktze.

Pambara, 890 m, in flowers, 27-10-1965, 25726.

Anisomeles indica O. Ktze.

Kuppadi, 890 m, in flowers, 6-2-1964, 18553.

Dysophylla auricularia Bl.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18621.

Gomphostemma heyneanum Wall.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19920; Pambara, 900 m, in fruits, 27-10-1965, 25716.

Leucas chinensis Br.

Pambara, 900 m, in flowers, 18-8-1964, 20483.

L. ciliata Benth.

Kuppadi, 900 m, in flowers, 6-2-1964, 18532.

L. marrubioides Desf.

Kuppadi, 890 m, in flowers, 6-2-1964, 18552; Sultan's Battery, 900 m, in flowers, 12-8-1964, 19946.

Plectranthus mollis (Ait.) Spreng.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19917.

Pogostemon paniculatus Benth.

Kuppadi, 900 m, in flowers, 6-2-1964, 18546.

P. pubescens Benth.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18604.

AMARANTHACEAE

Achyranthes bidentata Bl.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18609; Chedaleth, 900 m, in flowers, 19-8-1964, 20486.

Cyathula prostrata (Linn.) Bl.

Pambara, 900 m, in flowers, 27-10-1965, 25715.

POLYGONACEAE

Polygonum barbatum Linn.

Pavagada, 780 m, in flowers and fruits, 7-2-1964, 18576.

P. chinense Linn.

Kuppadi, 900 m, in flowers, 6-2-1964, 18527; Pambara, 900 m, in flowers, 27-10-1965, 25713.

P. flaccidum Meissn.

Paddy fields, Chedaleth, 900 m, in flowers, 19-8-1964, 20490; Elephant Camp I, Chedaleth, 850 m, in flowers, 27-10-1965, 25732.

***P. hydropiper** Linn.

Pavagada, 780 m, in flowers, 7-2-1964, 18583; Marshy area, Chedaleth, 950 m, in flowers, 10-5-1965, 24045.

PIPERACEAE

Peperomia dindigulensis Miq.

Waterfalls, Chedaleth, 900 m, in flowers, 17-8-1964, 20451.

P. reflexa A. Dietr.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18640.

Piper hymenophyllum Miq.

Kuppadi, 900 m, in flowers, 6-2-1964, 18541; Sultan's Battery, 900 m, in flowers, 12-8-1964, 19930.

P. nigrum Linn.

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18595; 900 m, in flowers, 12-8-1964, 19926.

LAURACEAE

Cinnamomum iners Reinw.

Sultan's Battery, 900 m, in buds, 11-2-1964, 18681; 890 m, in fruits, 9-5-1965, 24016.

Litsea coriacea Hook. f.

Sultan's Battery, 900 m, in buds, 12-8-1964, 19941; 820 m, in buds, 29-10-1965, 25769.

L. floribunda Gamble

Chedaleth, 900 m, in fruits, 13-8-1964, 19961.

***L. laevigata** Gamble

Kuppadi, 890 m, in fruits, 6-2-1964, 18551.

Machilus macrantha Nees

Kuppadi, 890 m, in flowers, 6-2-1964, 18567.

ELAEGNACEAE

Elaeagnus conferta Roxb.

Sultan's Battery, 950 m, in fruits, 8-2-1964, 18594.

LORANTHACEAE

Dendrophthoe falcata (Linn. f.) Etting.

Sultan's Battery, 900 m, in flowers, 11-2-1964, 18674 and 18682.

Helixanthera wallichiana (Schult.) Dans.

Chedaleth, 900 m, in flowers, 13-8-1964, 19950.

Taxillus tomentosus (Roth) van Tieghem.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18626.

Viscum angulatum Heyne ex DC.

Sultan's Battery, 900 m, in flowers and buds, 14-2-1964, 18699.

V. monoicum DC.

Odapallum, Chedaleth, 900 m, in fruits, 14-8-1964, 19979.

EUPHORBIACEAE

Acalypha ciliata Forsk.

Pavagada, 900 m, in flowers and fruits, 15-8-1964, 20409.

Antidesma diandrum Roth

Odapallum, Chedaleth, 900 m, in fruits, 14-8-1964, 19982; Kerala-Mysore border, Pavagada, 900 m, in fruits, 15-8-1964, 20412; Sultan's Battery, 890 m, in flowers, 9-5-1965, 24005; Kerala-Mysore border, Pavagada, 750 m, in fruits, 28-10-1965, 25746.

A. menasu Miq.

Stream side, Sultan's Battery, 860 m, in fruits, 9-5-1965, 24022.

Aporosa lindleyana Baill.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18651; Sultan's Battery, 890 m, in fruits, 9-5-1965, 24013.

Bischofia javanica Bl.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18649.

Bridelia scandens Gehrman.

Sultan's Battery, 950 m, in fruits, 9-2-1964, 18628.

Embllica officinalis Gaertn.

Pavagada, 900 m, in flowers, 13-2-1964, 18689.

Glochidion tomentosum Dalz.

Sultan's Battery, 950 m, in flowers and fruits, 9-2-1964, 18643; near Elephant Camp I, Chedaleth, 840 m, in flowers and fruits, 11-5-1965, 24067.

G. velutinum Wt.

Chedaleth, 900 m, in flowers, 20-8-1964, 20495.

Kirganelia reticulata Baill.

Sultan's Battery, 950 m, in flowers and fruits, 10-2-1964, 18648.

Mallotus albus Muell.-Arg. var. **occidentalis** Hook. f.

Chedaleth, 900 m, in flowers, 18-8-1964, 20481; Pambara, 900 m, 27-10-1965, 25724.

Melanthesa retusa (Dennst.) Kostel.

Sultan's Battery, 890 m, in fruits, 9-5-1965, 24023.

Phyllanthus rheedii Wt.

Pavagada, 900 m, in flowers, 15-8-1964, 20402.

Securinega virosa (Roxb. ex Willd.) Pax & Hoffm.

Sultan's Battery, 890 m, in fruits, 9-5-1965, 24028.

URTICACEAE

Artocarpus hirsuta Lamk.

Chedaleth, 975 m, in fruits, 10-5-1965, 24047.

Ficus hispida Linn. f.

Sultan's Battery, 900 m, in fruits, 11-2-1964, 18679.

Fleurya interrupta Gaud.

Waterfalls region, 900 m, in flowers, 17-8-1964, 20454.

Pilea kingii Fisch.

Pambara, 900 m, in flowers, 18-8-1964, 20476.

Pouzolzia indica Gaud. var. **alienata** Wedd.

Pavagada, 780 m, in flowers, 7-2-1964, 18577.

P. wightii Benn.

Pavagada, 780 m, in flowers, 7-2-1964, 18574.

Trema orientalis Bl.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18629.

GNETACEAE

Gnetum ula Bogn.

Sultan's Battery, 950 m, in female cones, 8-2-1964, 18593; Sultan's Battery, 950 m, in spikes (Male), 8-2-1964, 18596; Chedaleth, 900 m, in spikes (Male), 13-8-1964, 19963.

ORCHIDACEAE

Dendrobium haemoglossum Thw.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19939.

D. macrostachyum Lindl.

Chedaleth, 975 m, in flowers, 10-5-1965, 24054.

Disperis neilgherrensis Wt.

Sultan's Battery, 890 m, in flowers, 9-5-1965, 24015.

***Epipogium roseum** (D. Don) Lindl.

Waterfalls, 840 m, in flowers, 11-5-1965, 24061.

Eulophia nuda Lindl.

Kerala-Mysore border, Pavagada, 730 m, in flowers, 12-5-1965, 24073.

***Liparis prazeri** King & Pantl.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20421.

Oberonia ensiformis Lindl.

Sultan's Battery, 950 m, in fruits, 10-2-1964, 18657.

O. proudlockii King & Pantl.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18624.

O. santapaui Kapadia

Kuppadi, 890 m, in fruits, 6-2-1964, 18564.

Peristylus plantagineus Lindl.

Pavagada, 900 m, in flowers, 15-8-1964, 20410.

Pholidota imbricata Lindl.

Sultan's Battery, 950 m, in fruits, 8-2-1964, 18622.

Polystachya flavescens (Bl.) J. J. Sm.

Chedaleth, 900 m, in flowers and fruits, 13-8-1964, 19964.

Zeuxine longilabris Benth.

Sultan's Battery, 950 m, in flowers and fruits, 8-2-1964, 18603.

ZINGIBERACEAE

Alpinia malaccensis Rosc.

Sultan's Battery, 950 m, in flowers, 10-2-1964, 18653.

Costus speciosus (Koenig) Sm.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20434.

Curcuma neilgherrensis Wt.

Sultan's Battery, 890 m, in flowers, 9-5-1965, 24017.

Globba bulbifera Roxb.

Pavagada, 900 m, in flowers, 15-8-1964, 20407.

Hedychium flavescens Car.

Chedaleth, 900 m, in flowers, 13-8-1964, 19954.

Schumannianthus virgatus Rolfe

Chedaleth, 900 m, in flowers, 18-8-1964, 20467.

Zingiber wightianum Thw.

Chedaleth, 900 m, in flowers, 13-8-1964, 19969.

HAEMODORACEAE

Ophiopogon intermedius D. Don

Chedaleth, 900 m, in fruits, 19-8-1964, 20487.

AMARYLLIDACEAE

Curculigo orchioides Gaertn.

Chedaleth, 900 m, in flowers, 20-8-1964, 20497.

DIOSCOREACEAE

Dioscorea belophylla Voight

Kurichiyat, Chedaleth, 900 m, in flowers, 17-8-1964, 20449.

D. bulbifera Linn.

Kurichiyat, Chedaleth, 900 m, in bulbils, 17-8-1964, 20459; Pambara, 900 m, in female flowers and fruits, 27-10-1965, 25719.

D. hispida Dennst.

Pavagada, 730 m, in flowers, 12-5-1965, 24069.

D. oppositifolia Linn.

Waterfalls, Chedaleth, 840 m, in flowers, 11-5-1965, 24059.

D. pentaphylla Linn.

Odapallum, Chedaleth, 900 m, in fruits, 14-8-1964, 19973.

D. pentaphylla Linn. var. **linnaei** Pr. & Burk.

Kurichiyat, Chedaleth, 900 m, in bulbils, 17-8-1964, 20462.

D. tomentosa Heyne

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20419; Chedaleth, 975 m, in flowers, 10-5-1965, 24050.

LILIACEAE

Asparagus gonoclados Bak.

Odapallum, Chedaleth, 900 m, in fruits, 14-8-1964, 19977.

Dracaena terniflora Roxb.

Stream, Sultan's Battery, 860 m, in flowers, 9-5-1965, 24021.

Gloriosa superba Linn.

Odapallum, Chedaleth, 900 m, in flowers, 14-8-1964, 19981.

Scilla hyacinthina (Roth) Macbr.

Kerala-Mysore border, Pavagada, 725 m, in flowers, 12-5-1965, 24077.

Smilax perfoliata Lour.

Sultan's Battery, 950 m, in flowers, 9-2-1964, 18636; Chedaleth, 925 m, in fruits, 13-5-1965, 24103.

S. zeylanica Linn.

Sultan's Battery, 950 m, in fruits, 9-2-1964, 18627; Sultan's Battery, 900 m, in fruits, 12-8-1964, 19922.

PONTEDERIACEAE

Monochoria vaginalis Presl

Nilanjara, Chedaleth, 900 m, in flowers, 14-8-1964, 19990; Nilanjara, Chedaleth, 950 m, in flowers, 10-5-1965, 24046.

COMMELINACEAE

Aneilema sinicum Lindl.

Kerala-Mysore border, Pavagada, 900 m, in flowers, 15-8-1964, 20449.

Commelina indehiscens Barnes

Kuppadi, 890 m, in flowers, 6-2-1964, 18566.

C. paludosa Bl.

Pambara, 900 m, in flowers, 27-10-1965, 25723.

Cyanotis cristata Schult. f.

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19933; Odapallum, Chedaleth, 900 m, in flowers, 14-8-1964, 19978; Pavagada, 900 m, in flowers, 15-8-1964, 20408.

Floscopa scandens Lour.

Sultan's Battery, 950 m, in flowers, 8-2-1964, 18608.

Murdannia elata (Vahl) Bruckn.

Chedaleth, 900 m, in fruits, 13-8-1964, 19960.

M. terminalis (Wt.) Rolla et Kamath.

Pavagada, 725 m, in flowers, 12-5-1965, 24090.

PANDANACEAE

Pandanus furcatus Roxb.

Sultan's Battery, 900 m, in fruits, 14-2-1964, 18694.

ARACEAE

Colocasia esculenta (Linn.) Schott

Nilanjara, Chedaleth, 900 m, in flowers, 14-8-1964, 19999.

Lagenandra ovata Thw.

Stream, Sultan's Battery, 860 m, in flowers, 9-5-1965, 24019.

Remusatia vivipara (Roxb.) Schott

Sultan's Battery, 900 m, in flowers, 12-8-1964, 19947.

ALISMACEAE

***Sagittaria sagittifolia** Linn.

Nilanjara, Chedaleth, 900 m, in flowers, 14-8-1964, 20401.

ERIOCAULACEAE

Eriocaulon longicuspis Hook. f. var. **polycephala** Fyson

Sultan's Battery, 950 m, in heads, 8-2-1964, 18616.

CYPERACEAE

Cyperus exaltatus Retz.

Pavagada, 725 m, 12-5-1965, 24085.

C. haspan Linn.

Sultan's Battery, 900 m, 11-2-1964, 18669; Nilanjara, Chedaleth, 900 m, 14-8-1964, 19987.

C. malaccensis Lamk.

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19985.

C. nutans Vahl

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19993.

***C. pilosus** Vahl

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19989.

***C. zollingeri** Steud.

Kerala-Mysore border, Pavagada, 900 m, 15-8-1964, 20418.

Fimbristylis dichotoma Vahl

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19995.

***F. quinquangularis** Kunth

Nilanjara, Chedaleth, 900 m, 14-8-1964, 20000.

Kyllinga melanosperma Nees

Sultan's Battery, 950 m, 11-2-1964, 18670.

K. monocephala Roth.

Sultan's Battery, 950 m, 8-2-1964, 18613.

Lipocarpa argentea Br.

Sultan's Battery, 900 m, 11-2-1964, 18663.

Mariscus cyperinus Vahl

Sultan's Battery, 900 m, 11-2-1964, 18677; Sultan's Battery, 900 m, 12-8-1964; Nilanjara, Chedaleth, 900 m, 14-8-1964, 19997; Pavagada, 725 m, 12-5-1965, 24083.

Pycnus globosus Reichb.

Sultan's Battery, 900 m, 14-2-1964, 18700; Nilanjara, Chedaleth, 900 m, 14-8-1964, 19991.

***Scirpus erectus** Poir.

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19983.

S. mucronatus Linn.

Sultan's Battery, 950 m, 8-2-1964, 18618.

Scleria corymbosa Roxb.

Sultan's Battery, 900 m, 14-2-1964, 18693; Chedaleth, 900 m, 13-8-1964, 19955.

S. hebecarpa Nees

Kerala-Mysore border, Pavagada, 900 m, 15-8-1964, 20422.

GRAMINEAE

Alloteropsis cimicina (Linn.) Stapf

Pavagada, 900 m, 15-8-1964, 20403.

Axonopus compressus Beauv.

Sultan's Battery, 900 m, 12-8-1964, 19949.

Bambusa arundinacea Willd.

Sultan's Battery, 900 m, 11-2-1964, 18680.

Bothriochloa intermedia (Br.) A. Camus

Kerala-Mysore border, Pavagada, 900 m, 15-8-1964, 20427.

Centotheca lappacea (Linn.) Desv.

Kuppadi, 900 m, 6-2-1964, 18545.

Chionachne koenigii (Spr.) Thw.

Pavagada, 680 m, 28-10-1965, 25743.

Coix lacryma-jobi Linn.

Sultan's Battery, 900 m, 14-2-1964, 18692.

***Digitaria griffithii** (Hook. f.) Henr.

Pavagada, 900 m, 15-8-1964, 20405.

Eragrostis gangetica Steud.

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19992.

E. unioloides (Retz.) Nees ex Steud.

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19998.

Imperata cylindrica Beauv. var. **koenigii** Dur.

Kerala-Mysore border, Pavagada, 900 m, 15-8-1964, 20424.

Isachne dispar Trin.

Sultan's Battery, 900 m, 11-2-1964, 18665.

Oryza granulata Nees et Arn. ex Steud.

Pavagada, 900 m, 15-8-1964, 20411.

Panicum montanum Roxb.

Odapallum, Chedaleth, 900 m, 14-8-1964, 19974; Pambara, 900 m, 27-10-1965, 25717.

Paspalum conjugatum Berg.

Waterfalls region, Chedaleth, 840 m, 11-5-1965, 24062.

P. scrobiculatum Linn. var. **commersonii** Stapf

Nilanjara, Chedaleth, 900 m, 14-8-1964, 19994.

Pennisetum hohenackeri Hochst. ex Steud.

Sultan's Battery, 900 m, 11-2-1964, 18664; Paddy fields, Chedaleth, 900 m, 19-8-1964, 20493.

Pseudechinolaena polystachya (HBK) Stapf

Chedaleth, 925 m, 13-5-1965, 24098.

Saccharum spontaneum Linn.

Sultan's Battery, 900 m, 11-2-1964, 18661.

Setaria pallidifusca (Sch.) Stapf & Hubb.

Pavagada, 900 m, 15-8-1964, 20435.

S. palmifolia (Koen.) Stapf

Odapallum, Chedaleth, 900 m, 14-8-1964, 19980.

Themeda tremula (Nees ex Steud.) Hack. in DC.

Pavagada, 780 m, 7-2-1964, 18585; Pavagada, 700 m, 27-10-1965, 25737.

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