

**A CONTRIBUTION TO THE  
FLORA OF NAMDAPHA  
ARUNACHAL PRADESH**

**A.S. CHAUHAN**

**LICHENS : K.P. SINGH**

**BRYOPHYTES : D.K. SINGH**

*Edited By*

**P.K. Hajra**

**BOTANICAL SURVEY OF INDIA**

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CALCUTTA**

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**Cover Photo :** Confluence of Deban & Noa-Dehing rivers

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## FOREWORD

In the recent years, the need for undertaking and cataloguing floristic diversity in biodiversity rich areas in the country has been realised to be of great value. Realising the importance of this, the Botanical Survey of India has started intensive explorations and studies in areas which have not been studied thoroughly and the Namdapha Tiger Reserve which is rich in biodiversity has been taken up for such intensive floristic surveys and preparing an account of the plant wealth. The B.S.I. conducted surveys from 1983 to 1994 and gathered information on its plant wealth related to Lichens, Bryophytes, Pteridophytes, Gymnosperms & Angiosperms and their diversity met in different ecological habitats in the proposed Namdapha Biosphere Reserve, Arunachal Pradesh. Besides, ethnobotanically important plants, medicinal and wild relatives of cultivated plants as well as fauna of proposed reserve, etc. In all 1119 species spreadover 639 genera belonging to 215 different families of nonflowering and flowering plants have been described. Correct botanical names, relevant synonyms, short description, phenological data with their range of distribution have been provided for each species.

It is hoped that this publication will be of interest and use to students of botany, nature lovers, tourists, foresters and environmentalists in closely knowing the plants of this reserve which is located in the remotest corner of the country.

I congratulate the authors for undertaking this task and bringing out this valuable scientific information.

Botanical Survey of India,  
P-8, Brabourne Road,  
Calcutta - 700001  
Dated 14.03.1996.

P. K. Hajra  
Director

## PREFACE

Under the National Man and Biosphere (MAB) Programme detailed floristic, phytosociological, phytogeographical and ethnobotanical studies were undertaken in the Namdapha area, with the objective to assess the present status of the flora and to evaluate the feasibility of preserving this area as Biosphere Reserve. Situated in Chanaglang and Lohit districts of Arunachal Pradesh in the North Eastern region of the country, it harbours the component of Bengalian rain forest, Myanmar's Monsoon forest and Himalayan High altitude vegetation. The present flora embodies the results of research work carried out by the scientists of Eastern Circle, Botanical Survey of India, Shillong during 1983-94.

The main chapters include introduction, physiography, climate, vegetation types, floristics and phytogeography, economic botany, biotic factors and proposed plan for conservation measures. Under floristics and phytogeography along detailed analysis of the flora (Lichens, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms), list of endemic, rare and threatened plants are also given. The chapter on economic botany includes ethnobotany, wild relatives of cultivated plants, medicinal plants, etc. The chapter deals with correct nomenclature, short notes, phenological data, range of distribution of the included taxa. The Angiosperms are arranged according to the Bentham and Hooker's system of classification with internationally accepted modifications. Photographs of vegetation types, interesting plants (including those of ethnobotanical interest) are also incorporated.

It has been observed that these tropical evergreen rain forests are in successional stages due to the natural and anthropogenic factors.

Though the floral components of the area show greater affinities with the Malayan flora than the rest of India, the plant species of neighbouring and distant countries and a large number of endemic taxa also grow profusely in the area.

Due to several biotic factors the rich gene pool in certain pockets has been subjected to severe threats resulting in dwindling of population of several species considerably. It is, therefore, imperative that this pristine uninhabited vast stretches of tropical evergreen forest, being

natural home of a variety of flora and fauna must be conserved for posterity before this National heritage is lost for ever, by declaring it as a Biosphere Reserve or Nature Reserve.

The authors are thankful to the National MAB Committee and Department of Environment and Forests, Govt. of India for sanctioning the projects as without their financial assistance it would have not been feasible to accomplish the present study. The authors are also grateful to the Secretary, Ministry of Environment and Forests, Govt. of India, New Delhi for evincing keen interest in the project, to Dr. S.K. Jain, F.N.A., Dr. M.P. Nayar and Dr. B.D. Sharma, ex-Directors Botanical Survey of India for providing the facilities to Dr. J. Joseph, ex-Joint Director, Botanical Survey of India, under whose able guidance this project was initiated; and to Sri A.R.K. Sastry, ex-Joint Director, Botanical Survey of India, Calcutta and Sri B.M. Wadhwa, ex-Deputy Director, Botanical Survey of India, Shillong for critically going through the manuscript, needful suggestions and the encouragement.

Sincere thanks are also due to all the staff members of the Botanical Survey of India, Eastern Circle, Shillong for their sincere co-operation and help in various ways to complete this work.

Last but not the least, thanks are also due to Shri M.L. Jain, M/s Deep Printers, New Delhi for the care taken in printing this flora nicely.

AUTHORS



*Aeginetia indica* L.- a root parasite.





*Rhopalocnemis phalloides* Jungh- An interesting, rare root parasite of the family Balanophoraceae.



*Bulbophyllum* sp. - a showy Orchid



*Bulbophyllum devangiriensis* Balakr.



*Pleione maculata* (Lindley) Lindley



*Pleione praecox* (J.E. Smith) D. Don



*Arachnis cathcartii* (Lindley) J.J. Smith



*Arundina graminifolia* (D. Don) Hochr. — the bamboo orchid.



*Coelogyne barbata* Griffith— a wild orchid.



*Swertia angustifolia* Buch. - Ham. *ex* D. Don var. *pulchella* Burkill - an ornamental plant.



*Callicarpa arborea* Roxb. - fruits of which are eaten by birds.



*Primula edgeworthii* (Hook. f.) Pax. - a plant of ornamental value



Another wild species of banana (*Musa velutina* Wendle. & Drude)





*Alpinia nigra* (Gaertner) Burt - a zingiberaceous plant.



A close up of the flower of *A. nigra* (Gartner) Burtt



*Hedychium coccineum* J.E. Smith - an elegant species of Zingiberaceae.



*Geodorum densiflorum* (Lam.) Schltr. - a terrestrial orchid



*Taenia latifolia* Benth. ex Hook. f.



Fruits of wild Musa (*Ensete glaucum*). (Roxb.) Cheesman



*Phaius tankervillae* (Aiton) Blume



*Dendrobium lindleyi* Steud. - an ornamental Orchid.



*Denudobium jenkinsii wallichii* ex Lindley another snowy Orchid





*Phaius tankervillae* (Aiton) Blume



*Cymbidium munronianum* King & Pantl.



*Cymbidium mastersii* Griffith ex Lindley



Confluence of rivers Noa-Dihing and Deban river at Deban



*Sapria himalayana* Griffith - a rare and interesting root parasite of the family Rafflesiaceae.



*Balanophora dioica* Royle - another interesting root parasite.



*Aerides odorata* Lour.



*Phalaenopsis mannii* Reichb. f.



Deciduous tree species after Gandhigram.



A view of Namdapha Biosphere Reserve.



Another view of the Biosphere.



View of tropical forest in the Reserve at 60th Mile.





Primary tropical rain forest at Gandhigram.



Tropical forest near Deban with *Musa* sp. in the foreground.



*Dipterocarpus retusus* Blume after 10th. Mile on M.V. Road



*Dendrocalamus hamiltonii* Nees & Arn. ex Munro thickets before Vijoyagar.



Disturbed tropical forest near Gandhigram.



Secondary forest at Ramnagar.



*Bulbophyllum careyanum* (Hook.) Sprengel



Degraded forest at 10th. Mile, M.V. Road.



Forest view at 65th. Mile, M.V. Road with Noa- Dihing river in the foreground



*Garcinia tinctorea* (DC.) W.F. Wight - another medicinal plant



*Citrus medica* L. - a wild variety of lemon.



*Viola palmaris* - a perennial herb along forest edges.



*Chirita mishmensis* Debb. & Biswas - a rare and endemic plant.



*Pseudostachyum polymorphum* Munro at 24th. Mile, M.V. Road.





*Dendrocalamus hookeri* Munro at Kumon Bum.



Thick forest view with waterfall in the back ground.



Suspension bridge made of canes at Gandhigram.



*Crinum amoenum* Roxb. - a plant of horticultural value.



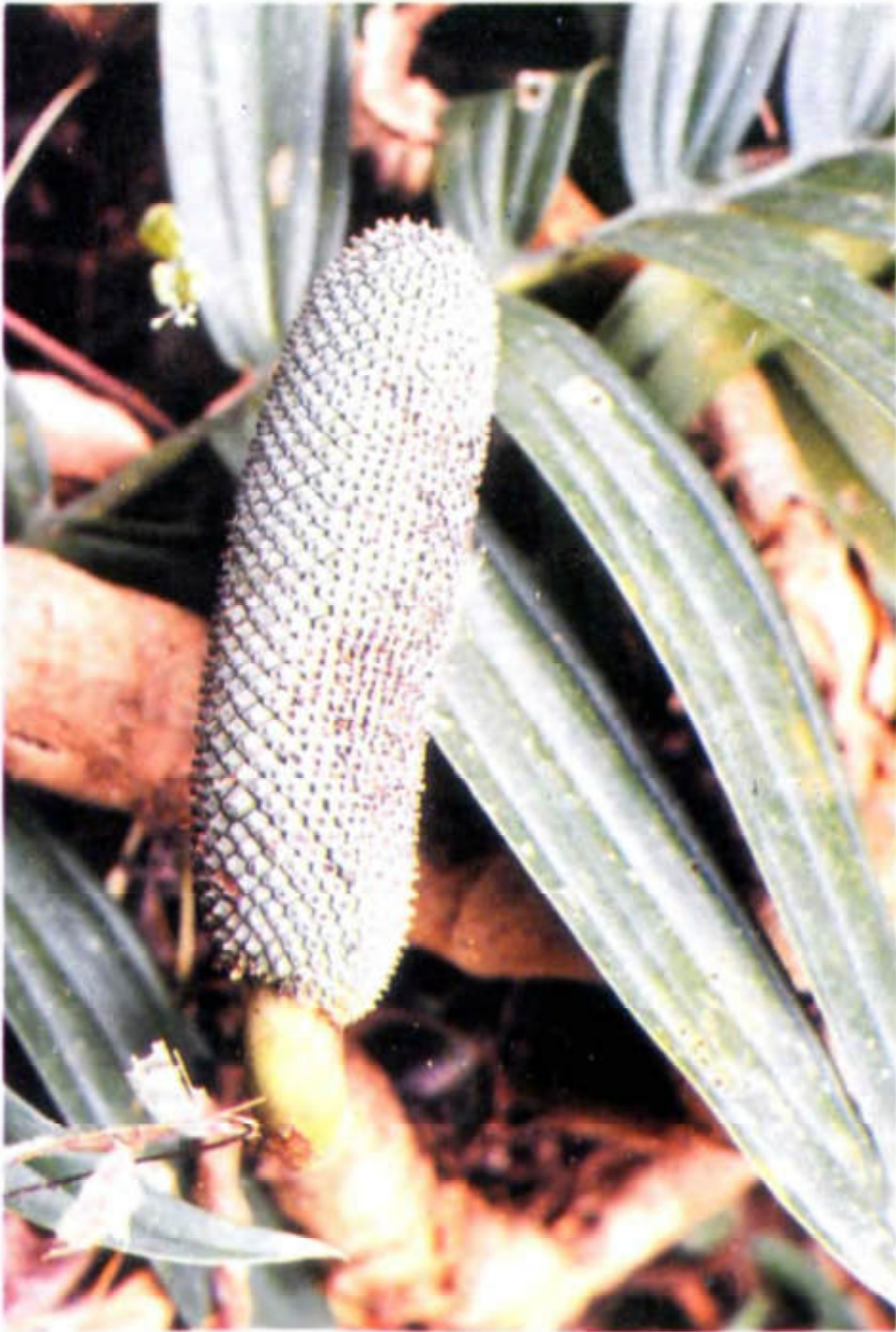
*Arisaema consanguineum* Schott - A plant growing profusely near moist places



*Aeschynanthes superba* C.B. Clarke rare epiphytic plant.



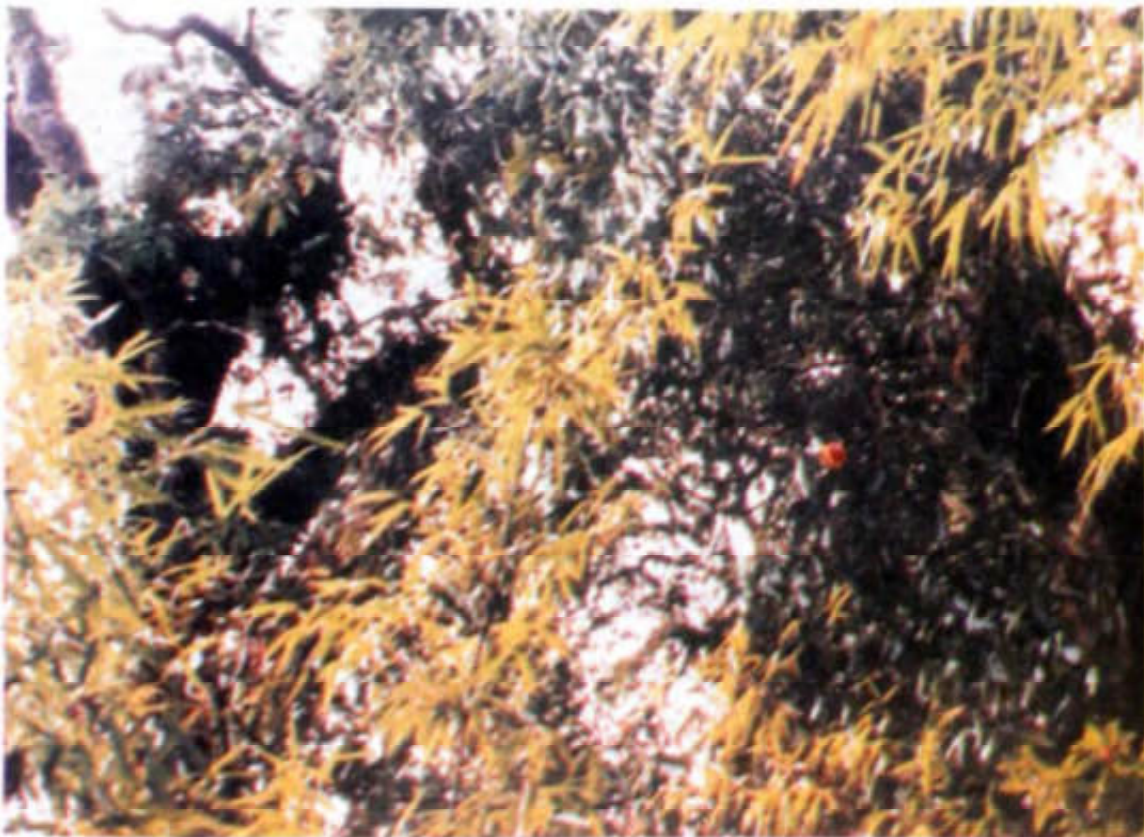
*Embelia ribes* Burm. f. - ripe fruits edible.



*Rhapsidophora decursiva* (Roxb.) Schott - fruits are used as baits for trapping fishes.



*Clerodendrum viscosum* Vent var. *viscosuma* plant of medicinal Value.



*Cephalostachyum pallidum* Munro at Kumon Bum.



*Chimnobambusa griffithiana* (Munro) Nakai at Kumon Bum.



Tribal folk engaged in lumbering work.





Local tribal selling forest produce in the Miao market.



Different types of baskets used by tribal ladies made of *Bambusa tulda*, *Dendrocalamus hamiltonii*, *Calamus flagellum* and *Calamus floribunda*.



Fishing trap made of bamboo (*Bambusa tulda* Roxb.)



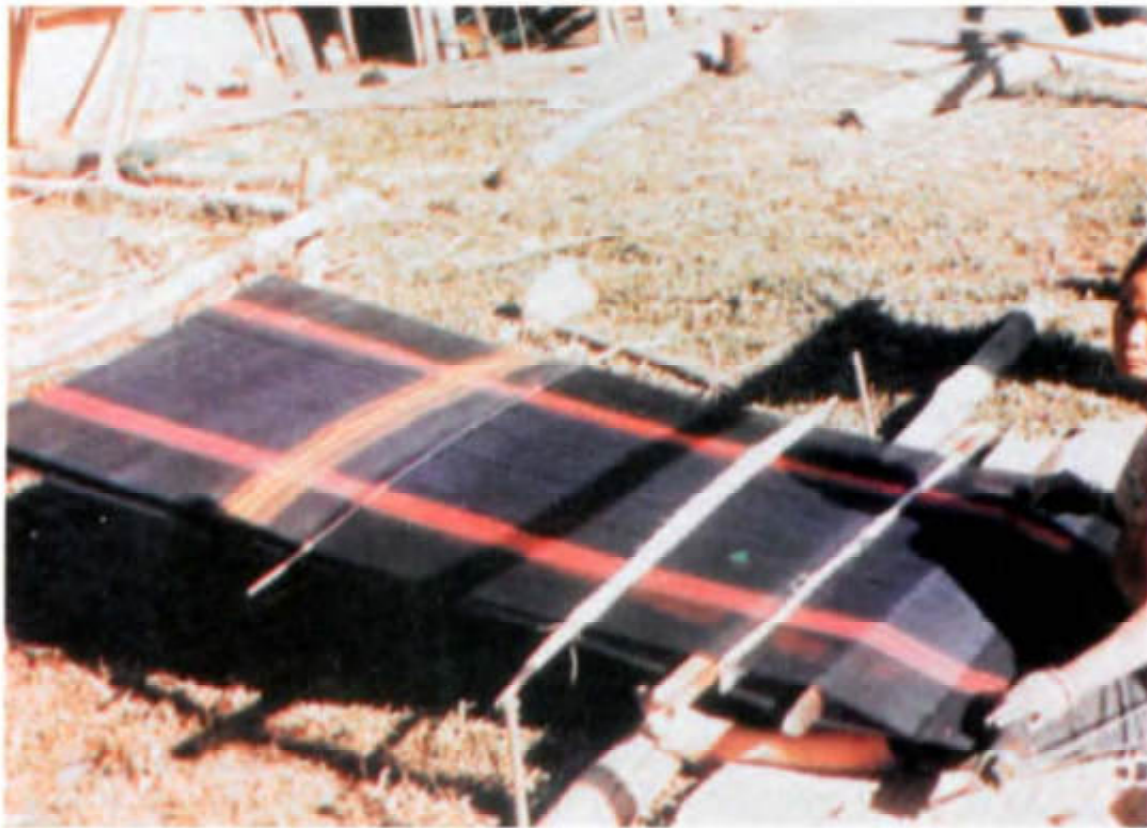
Jhum field - a major cause of deforestation in whole North-eastern region.



Different types of baskets used by tribals.



Tribal boys selling bamboo tubes made of *Bambusa tulda*, *Dendrocalamus strictus*, used as drinking vessels.



A Chakma lady weaving cloth.



*Chirita macrophylla* Wallich- a plant of rare occurrence.

## INTRODUCTION

Before the advent of man on the earth, the green mantle or the vegetation in the form of existing plantlife could exist without man, the converse is not true. The dependence of man on plants for various needs is well known and need not be emphasized. However, in recent times the combined factors of population growth, the over utilization of plant resources and degradation of natural ecosystems have threatened to destroy the delicate equilibrium that exists between the man and the nature. The expansion of biotic activities into the primeval forest areas and exploitation of ever shrinking natural resources have disturbed the fragile ecosystems, thus accelerating environmental degradation throughout the globe.

The entire world is now highly concerned about the imminent environmental disaster and the need for conservation of environment is widely discussed. It is realised world over our environment and that biodiversity holds the key for future quality of human life on this earth.

It has also been realised that only 10-15% of the total number of species of organisms have so far been discovered and described and for the majority, we do not have even a record of their existence and any knowledge of their biology. This rich genetic diversity is being depleted rapidly through indiscriminate exploitation, habitat destruction, rapid deforestation and urbanisation on the one hand and spread of harmful chemicals, introduction of alien species and lack of proper exploration and taxonomic studies on the other. The 7000 million hectares of forests which we had in the world in the last century, has already dwindled to 2000 million hectares by now.

At global level, forests are being destroyed at the rate of one football field worth every second and the area equalling Portugal worth every year. An enormous hole in the Ozone layer jeopardizing the earth's ability to protect life from deadly ultraviolet radiations is the recent discovery causing grave concern to all. Huge quantities of chemical wastes viz. carbon dioxide, methane and chlorofluorocarbons are being dumped in to the atmosphere, trapping the heat and raising global temperature.

In India, we are left with a paltry 19.4% of the total land area under the forest cover, as against a mandatory 33%. Besides, the forestry in India has been regarded as revenue generating sector which has thus contributed a lot in depauperisation of forest cover. Ironically to

some extent, the same philosophy persists even at present. The alarming pace of destruction of the plant habitats has resulted in the fragmentation of their populations, and the genetic flow thereby, leading to the loss of viability and diversity. The depletion of one species in such ecosystem has led to the loss or migration of several dependent species of flora and fauna. The rapid shrinkage of the forests has resulted in the depletion of vegetal wealth considerably, bringing a few thousands of species to the verge of extinction. These include several taxa of potential importance for food, medicine and horticulture development, etc.

Alarmed at the unprecedented rate of vanishing of living species the International Union for Conservation of Nature and Natural Resources (IUCN) has estimated that *ca* 10% of the total taxa are presently threatened with depletion or extinction. Myers (1980) observed that atleast one species is lost every day in the tropical forest alone and the situation may worsen to an extent when even one species may disappear every hour. According to one estimate *ca* 30% of our genetic diversity may be lost for ever by 2050 A.D.

Viewing the urgency, plant conservationists concerned are on this matter, especially on the possible consequences of species elimination in the fragile ecosystems in the tropics which harbour maximum concentration of plant diversity. In India, the North East region being the primary centre of origin of angiosperms, or to put in the words of Takhtajan, the cradle of flowering plants ; the need for detailed studies has been felt. These areas have contributed more to our domesticated plants and are still the centres of maximum plant and animal diversity.

The importance of conservation of tropical habitats and species diversity for the survival of the humanity is now widely recognised. An exhaustive inventory of tropical plants is one of the primary objective for the plant taxonomists throughout the world, but the goal remains a far cry, especially in the developing and underdeveloped countries in the tropics of the world.

This is true for the North-eastern India too, which comprises the seven sister states of Arunachal Pradesh, Assam, Nagaland, Manipur, Mizoram, Tripura and Meghalaya, with about 1, 21, 828 sq km under forest and approximately 7000 plant species (*ca* 50% species of known flowering plants in India). The region represents a wide range of physiography and eco-climatic conditions and is endowed with vast and luxuriant vegetation ranging from tropical to alpine, with rich gene pool of both wild and cultivated plant species. Though the flora of this region exhibits an Indo-Malayan affinity, the floral elements of other parts of India, the neighbouring and far off countries have also contributed to its richness and diversity.

The rich plant diversity of the region include *ca* 600 species. of Orchids, more than 450 species. of grasses, *ca* 68 species. of bamboos, *ca* 65 taxa of Rhododendrons, *ca* 42 species of *Impatiens*, *ca* 34 species of *Hedychium*, besides a number of species of canes, *Musa*, *Citrus*, *Piper*, *Dioscorea Cinnamomum* and Primulas, etc. grow profusely in this region.

In the recent past wanton clearance of forests, slash and burn mode of cultivation, forest fires and other biotic interferences have led to the reduction of forest cover and what is equally ominous is the depletion of forest which is still going on unabated in some states, *viz.* Assam, Mizoram, Tripura and Meghalaya. Consequently, *while ca* 700 taxa of this region are facing threat for their survival in wild. Vast area of land has transformed into barren and unproductive wastelands. Besides, due to an ever widening gap between demand and supply on natural resources, the feasibility to bridge the gap between our annual increase of forestry stock and natural regeneration on one hand and from plantation on the other due to heavy population growth and live-stock pressure, is also becoming inadequate.

The idea of setting up Biosphere Reserves and their total conservation was evolved from the initiative of the International Biological Programme (IBP) started in 1964 under the auspices of the International Council for Scientific Unions (ICSU). The importance of IBP study for conservation of plants and animals has been properly assumed and as a result, the UNESCO took initiative and launched the 'Man & Biosphere' Programme (MAB) on global basis in 1974, which envisages the study of the structural and functional aspects of various ecological systems and setting aside unique natural biomes as 'Biosphere Reserves' for posterity and for environmental research. The recognition of Biosphere Reserve concept is of vital interest and importance to the world as it helps in conservation of genetic material in natural habitats and the role they will play in scientific research and education. They will serve as bench marks against which ecological changes can be measured and the performance of other ecosystems judged. The objectives of the International Network of Biosphere Reserve are:

- (i) To conserve for present and future use the genetic diversity of biotic communities of plants and animals within the natural ecosystem on which their continuing evolution depends.
- (ii) To provide areas for ecological and environmental research including (Particularly) baseline studies both within and adjacent areas to these reserves.
- (iii) To provide facilities for education and training.



Recently, under the World Conservation Strategy, Talbot (1980) added the following three additional and extremely relevant objectives :

- (i) To maintain essential ecological processes and life support systems.
- (ii) To preserve genetic diversity, and
- (iii) To ensure that the utilisation of living resources and ecosystems in which they are found are sustainable.

Subsequently, in India, late Mrs. Indira Gandhi, the then Prime Minister, launched a Conservation Strategy' on 6th March, 1980 with the following objectives:

- (i) Maintenance of essential ecological processes and life support systems on which human survival and development depend.
- (ii) Preservation of genetic diversity.
- (iii) Ensuring sustainable utilisation of species, which support rural communities and major industries.

To formulate the National Conservation Strategy in our country, there can hardly be few areas of more than one or two thousand square kilometres extent without a multitude of humanity living at the subsistence level. Such areas include the cold desert of Ladak, the dry hot deserts of the Thar, the salt marshes of Rann of Kutch and a few inaccessible regions of the Eastern Himalaya in Arunachal Pradesh.

Out of the above mentioned areas, if one considers a potential area for tangible benefits for mankind, the area should have significant biotic wealth. The priority, therefore, gets restricted to the tropical Eastern Himalaya rather than the bleak deserts of snowy (waste-land) areas. In the tropical Eastern Himalaya, significantly large areas, both accessible as well as inaccessible, with natural biota are restricted to Changlang and Lohit districts of Arunachal Pradesh. Here again, the biotic richness, genetic diversity and ecological considerations compel us to choose Namdapha area that extends over 2500 sq km of uninhabited land spread over in Changlang and Lohit districts of Arunachal Pradesh.

The Namdapha area identifies one of the ecologically richest biotic communities in India. The area is covered with virgin lush evergreen dense tropical forest extending over 4000 sq km between the altitudes of 200 to 4571 m. The forest wealth is by far the richest natural endowment of the area. The great strength of this natural wealth lies in their utter immensity, density and vitality. The tropical humid

climate coupled with heavy rainfall facilitates dense floristic growth, and everything in these forests grow with almost insane vigour. These natural virgin forests in the remote corner of the country, at the trijunction of India, Myanmar and China, exhibiting the tropical, subtropical, temperate and even alpine ecosystems are so complex, delicate and fragile that a minor imbalance could be detrimental to the interest of human beings who inhabit this natural environment.

Though Namdapha falls in the remote corner of the country, yet it could not escape from human interference. Destruction of biotic potential under optimal productivity of the land is obvious in this area. Forests have been extensively felled unchecked for timber and jhum cultivation leading to instability in the mountain slopes in this earthquake prone area. Extensive clearance of forests has been made particularly around Nampong, Deban, M' Pen, Manbum, West side of Tezu, Tiskar Road, Glao lake area, Gandhigram and Vijoynagar, etc. for settling refugees, viz. Chakma from the Chittagong hill tracts of Bangla Des., Lamas from Bhutan, Tikhak, Tangsa, Mogbu, Tibetan, etc. in Manabum, Diyan areas and Jayrampur Nampong areas respectively. Gandhigram and Vijoynagar areas are occupied by the Lisu tribe who migrated from China through Myanmar. Besides, Ex-Assam Rifles Jawans, comprising 200 families of Nepalis and 14 families of Mizos, etc., have also been settled in the Vijoynagar settlement area. Considerable damage has been done in Littoral forests along coast-line at Manabum and Diyan areas.

In the project document of the proposed Namdapha Biosphere Reserve, prepared by Dr. S.S. Nair and published by the Ministry of Environment and Forests, New Delhi, it has been stressed that the deforestation should be halted immediately and a landuse capability survey with the help of latest scientific methods should be carried out to define the landuse pattern taking into consideration the climatic, edaphic and topographic factors. Nair (1981) also suggested for setting aside some areas as 'Biosphere Reserve' so that these may serve as the gene pool reserve for the threatened species of the plants and animals. A serious concern has been expressed over the deforestation in these forests which could affect or destabilise the ecosystem and environment. It is stressed to establish nature reserves in different ecotypes not only to prevent destruction of gene reservoirs, but also to make it available for scientific and conservational studies.

With a view to establish a Biosphere Reserve in this remote corner of the country, the MAB Committee of Government of India launched a project through the Botanical Survey of India entitled "Study and Conservation of the Plant resources of the proposed Namdapha

Biosphere Reserve, 'Tirap District, Arunachal Pradesh', with the following objectives :

1. To conduct studies on the flora and vegetation for preparing a detailed status report on the proposed Namdapha Biosphere Reserve with emphasis to ascertain the uniqueness of the flora.
2. To find out the taxa unique to the area both new and rare.
3. To find out the taxa known only from other regions so far, but could be available in this region.
4. To report the abundance and frequency of taxa with special reference to rare, endangered and threatened species.
5. To study the inter and intraspecific variations of species met in the region.
6. To find out genetic diversity among the wild relatives of the cultivated plants like *Musa*, *Citrus*, *Piper*, etc.
7. To find out the availability of primitive plants and their frequency.
8. To make a detailed study of the orchids, palms and canes.
9. To make the inventory of taxa of Indo-Tibetan, Indo-Chines, Indo-Malayan and Indo-Myanmari affinities in particular and other countries in general.
10. To find out occurrence of plants of ethnobotanical importance, viz. wild edible plants, medicinal plants and other plants of economic potentiality.
11. To suggest and attempt measures for conservation of plant resources by demarcating the core zone, buffer zone and manipulation zones etc. which will serve as nature's referred system.

### PHYSIOGRAPHY

The proposed Namdapha Biosphere Reserve is situated in the North East corner of India in the Changlang and Lohit districts of Arunachal Pradesh between 27.51' - 28.51' N Latitude and 95.45' - 97.30' E Longitude. It is bounded in the North by the Mishmee hills, on the East by Homekharan Bum (with extensive table-land and high peaks over 4000 m, the highest being Dapha Bum at ca 4571 m above MSL) on the West by Dibrugarh District of Assam whereas its southern limit extends into Patkoi hills in Myanmar. In general, its geographical position is unique being situated at the junction of the outspurs of North Eastern Himalaya and Patkoi ranges of Myanmar (Burma).

**Topography :** The proposed Namdapha Biosphere Reserve is highly rugged area with deep valleys and hill ranges running in different directions. The Great Himalaya at its eastern end take a mighty sweep around the peak of Namcha Barwa (7,765 m) in Tibet and swings forwards to south-east. The high table-land of Tibet lies towards the North and South Chinese Szechwan mountains lie towards the East. The Eastern Himalaya trails off towards the South in a narrow ridge which are slightly forwards to the East meeting the eastern end of the Patkoi mountains at Chaukam pass. The eastern side of the mountains are drained in the Irrawady basin while the western slopes are drained in the Brahmaputra basin. Parallel to but North of Patkoi there is a higher ridge, stretching from East to West called the Dapha Bum ridge which has many high peaks of over 4500 m. This ridge separates the Noa-Dihing drainage basin from the northern Lohit river basin. The Dapha Bum ridge meets the tail end of the Eastern Himalaya where the Changlang and Lohit district boundaries meet in an area of glaciers and snow covered peaks which continues north-east along the Indo-Myanmar border to the trijunction of India, Myanmar and China. These higher areas in the catchments of the southern tribal areas of Lohit, such as the Kamlang, Lati and Kulung, are unexplored. From these main high mountain ridges, several other ridges, viz. Kumon Bum, Langatka Bum, Nanan Bum, Nshand Bum, Miao Bum, etc., radiate. These hill ranges rise abruptly to substantial height resulting in a spectacular panoramic view of the reserve. The altitude of Namdapha varies from 200 m to 4571 m (Dapha Bum) above mean sea level. It has moderate slope at centre of the present Tiger Reserve (Diyun Valley), i.e. from Happy valley via Bulbulia, Firmbase to Embiong area. Along the northern bank of Noa-Dihing river the land gradually become steeper in the Dapha Bum range of the northern part of the Tiger Reserve and in the Patkoi range in the southern part of the Biosphere Reserve. Parts of the Dapha Bum ridge with its extensive forests lie in some of the most earthquake prone areas in India.

The Diyun valley is the only route, free from snow, linking upper Myanmar with the Assam Valley, besides the one through the Pangsua pass further West. Many Arunachal Tribes who trace their origin from Thailand or further East might have moved in along this valley.

The Dapha Bum ridge is drained towards the North by the Kamlang, Lati and Kulung tributaries of the Lati river which finally join the mighty Brahmaputra. The main river in the proposed Biosphere is the Noa-Dihing, which originates from the mountains near the Chaukam pass on the Indo-Myanmar border and flows in east-west direction finally joining Brahmaputra. The other major river, Namdapha originates

from the Phonga pass and runs in north-south direction and finally joining the Noa-Dihing at 55 Km point. The Deban river originates from Dapha Bum and runs south wards. It also joins Noa-Dihing at Deban. Another perennial and dangerous water stream, Burma Nala originates from the Patkoi ranges and runs northwards finally joining Noa-Dihing at 64 km point. Similarly, Namphai and Namphuk rivers originate from the Patkoi ranges and run north-west to ultimately join. Noa-Dihing. Apart, there are innumerable seasonal streams and streamlets which swell with a surfeit of water during the rains, casting and widely tumbling in river falls and rapids in the rugged hill areas before quieting into river Noa-Dihing. Most of these rivers are perennial and fed by snow. Besides, some natural pools, locally called 'Beels', viz. Pani Jheel, Rani Jheel, Ganga Jheel, Moti Jheel, M'pen Jheel, Dipi Lake, Gfiao lake etc. are also found in the proposed Biosphere Reserve. These ponds vary in size from 200 to 1000 sq m or even more with the depth varying from 1 m to 3 m or more. During winter, most of them dry up and remain muddy. It is interesting to point out here that maximum concentration of the animals have been observed in these areas.

## GEOLOGY

Geologically the proposed Biosphere Reserve area is of recent origin and owes its formation to the upheavel of the Himalayas in pleiocene period of the Tertiary age. The geological information of this area dates back to 1886 when La Touche (1886), during his reconnaissance traverse of the Noa-Dihing valley up to Chaukam Pass, visited Miao Bum and referred to thin coal seams exposed on the hill slopes at a distance of 2.4 km from Dihing at an elevation of 433 m above Dihing. The information so far has led to the deciphering of various geological aspects, structural, tectonic and geomorphic in broad patterns and has helped to some extent in establishing the mineral resources of the park. Tertiary and Quarternary sequence of the area is the extension from Nagaland and upper Assam.

Disang of rocks are restricted around Nampong, in the southern parts of the park area. It consists of dark grey, splintery shales and thin grey sand stone bands. The over lying Barail group is classified into three well marked formations. The lower most Naogaon formation consists of fine grained, hard and compact flaggy sand stone with grey shale, sand shale and Carbonaceous shale. The over flying Baragoloi formation comprises hard, massive grey and reddish stones with clay carbonaceous shale and numerous inpersistent coal seams. The topmost Tikak parbat formation extends from Nampong area and goes up to Vijoyanagar along the southern bank of Noa-Dihing river. Near Vijoyanagar

it occupies the Noa-Dihing valley. It consists of medium to coarse, grey and light coloured sand stone with minor grey shale, white clay and carbonaceous shale. Thick workable coal seams are found at the local part in the upper Assam area where as in the park area the persistent coal seams range from 0.5 - 1.5 m thick.

Barail group of rocks generally overlain by Myanmar group of rocks are not exposed in the park area. Tipam group of rocks are quite thick in the park area and well exposed in Noa-Dihing and Namphuk river valleys. Tipam group contains fragments of silicified and semicarbonised fossil tree trunks. The Tipam group includes several soil and sand horizon in upper Assam. Well preserved dicot leaf impressions have been collected from Tipam sandstone formation.

Nam Rong Khu formation chiefly consists of coarse, loose, poorly consolidated ferruginous, bluish grey sand and grey clay with layers of pebbles. These beds are well exposed near period on Miao-Vijoy nagar road and Miao Nala. Dihing formation seen along the southern and northern banks of Noa-Dihing river up to Deban where from it takes a NNE turn and abuts against the Dapha Bum range. The Dihing group is unconformably overlain by the alluvium. This consists of bluish or grey clay with sand lenses, shingle gravel and boulder deposits. A major part of Noa-Dihing river valley is covered by recent alluvial deposits. Alluvium shows much variation from place to place.

## SOIL

Soil is characterised by a loamy surface layer of considerable depth and texture with colour varying from yellow to reddish. It is acidic in nature. Deep layer of sandy loam soil, rich in vegetative matter is also found in the lower gentle slopes of the hills which support the best, fully stocked *Dipterocarpus* forests. On the ridges and precipitive slopes, the soil depth becomes shallow while on the areas near the river banks, liable to frequent inundation, the soil tends to be sandy on the sloping grounds and loamy on flat grounds.

In flat lands and along stream banks, the soil is fresh water alluvium. The rich grey, brown and red soil, derived from the calcareous sand stone support the luxuriant tropical forest vegetation. Heavy clays to clay loams are found mostly in valley areas. The soil depth varies with slopes with shallow soil characterising higher elevations and deep soil in the valleys and river sides. The profile shows no visible stratification into horizons.

The high rainfall causes an almost continuous percolation of water through the streams and beels into the main rivers and the soil has very low moisture retaining capacity. Humus or organic matter, being washed away by the heavy rainfall assisted by the steep slopes and loose texture of soils, is comparatively poor in the hill slopes. The soil is highly permeable and thus strongly leached. The soil of the rain forests of Jhum lands are generally poor in nutrient content which is a characteristic feature of the tropical "Ombrophilous" forests. This is due to the fact that in tropical rain forests favourable climatic conditions facilitate quick mineralisation and dead biotic materials and the released nutrients are immediately absorbed by the roots of dense vegetation. Therefore, the amount of nutrients in the soil at any given time is considerably reduced. The entire nutrient capital necessary for the continuous growth of this type of lush tropical vegetation is tied up in the living plant itself.

### CLIMATE

The area falls within the geographically subtropical zone, and enjoys subtropical climate with a distinct, though short, cold weather from November to February in the lower reaches. This is the most pleasant period when humidity in the air is least. However, the cold season persists for longer period at higher altitudes as in other Himalayan region. With the onset of south-west monsoon, the humidity starts rising in the month of May. This, coupled with the rise of temperature, makes the weather oppressive especially during the months of June, July and August. The tract is highly malarious.

Due to the altitudinal variations between 200 to 4571 m, the area being the zone of heavy rainfall, the climate varies at different heights. Since the entire high altitudinal area has not been explored as yet, the climatological classification for those zones is not feasible at this moment. On the other hand there is no meteorological observatory in the adjacent areas. However, on the basis of the experience and available information, seasons can be classified as follows:-

- (i) The cold season, from December to February
- (ii) The premonsoon season, from March to May
- (iii) The monsoon season followed by South-west monsoon till September
- (iv) The postmonsoon season from October to November. It is also a period of transition

The varied topography has profound influence on the climate which varies according to elevation and location. The mountainous part

of the territory enjoy, what is known as montane type of climate while the low lying narrow peripheral plains and the valleys experience tropical climate.

The montane type of climate is characterised by the terrain in relation air to temperature and its variation which in turn cause other weather phenomena like occurrence of fog, thunder-storm etc. There are large diurnal variations of temperature particularly in the valleys.

### RAINFALL

Heavy rainfall during the monsoon is an important feature of this territory. The area receives its winter rainfall, particularly in the northern parts, from western disturbances. Narrow peripheral strip of land below the elevation of 1000 m surrounding the Brahmaputra valley is the rainiest part of the territory, receiving more than 250 cm of rain annually. In this region, the rainfall increases to 400 cm towards east. The number of rainy days with more than 2.5 mm of rain averages between 125 to 150 annually.

An entirely dry month is rare, except in the western fringes of the Biosphere Reserve, where December and January are usually dry. The monsoon which lasts till September, contributes nearly about 75% of annual rainfall in the area. June, July and August are typical monsoon months experiencing the heaviest downpour. March, April and May months receive comparatively less rainfall. Floods are frequent in some parts.

### TEMPERATURE

December and January are generally the coldest months, when the mean maximum temperature in the plains (below 900m) is normally about 20° C whereas the mean minimum temperature ranges between 5°-20° C. Much lower temperature is experienced at higher elevations above 3000 m where it is usually below freezing point. The months of July and August are normally the warmest when the mean daily temperature hovers around 27° C at places below 900 m where as at the elevation of 3000 m, the mean daily temperature is usually around 25° C.

### RELATIVE HUMIDITY

Relative humidity is always high except in the winter months. Clear or partially clear skies are common during the post-monsoon season. During summer the relative humidity is between 60-70%.



## VEGETATION

The unique geographical position, varied topography, high annual precipitation spreading throughout the year and minimum destruction by human interference make the area one of the richest treasure-houses of botanical wealth.

Due to its inaccessibility and remoteness, the vegetation of Namdapha is still pristine and virgin. It represents a true wilderness of enchanting, lush green vegetation. There is such a luxuriance and floral diversity that no single species can be said to be dominant in the area.

The vegetation can be broadly classified into tropical, temperate and alpine. The tropical and sub-tropical evergreen forests predominate the area. The tropical wet-evergreen forests are mostly in lower reaches and alpine vegetation is met with in upper reaches. The low-land tropical evergreen forests of Namdapha are perhaps the largest remaining *Dipterocarpus* forests in the whole of India (Anonymous, 1981).

The trees, the best of *Dipterocarpus retusus* Blume (Hollung), sometimes reach an height of about 50 m. The tall trees have large buttresses and are covered with the epiphytic growth of Lichens, Bryophytes, Ferns, Peperomias, Aroids and Orchids. There are about 150 timber yielding species growing in the area.

Some of the common tall trees of this area are : *Alnus nepalensis* D. Don, *Anthocephalus chinensis* (Lam.) A. Rich, *Artocarpus chama* Buch.-Ham., *A. heterophyllus* Lam., *Canarium strictum* Roxb., *Castanopsis echinocarpa* Miq., *C. kurzii* (Hance) S.N. Biswas, *C. tribuloides* (Smith) DC., *Celtis tetrandra* Roxb., *Dipterocarpus retusus* Blume, *Duabanga grandiflora* (Roxb. ex DC.) Walp., *Elaeocarpus aristatus* Roxb., *E. sphaericus* (Gaertner) S. Schum., *Exbucklandia populnea* (Griffith) R. Br., *Ficus altissima* Blume, *F. elastica* Roxb. ex Hornem., *F. drupacea* Thunb. var. *pubescens* (Roth.) Corner, *F. nervosa* Heyne ex Roth., *F. rigida* Jack., *Mangifera sylvatica* Roxb., *Nauclea griffithii* Hav., *Quercus lamellosa* Smith, *Q. semi-serrata* Roxb., *Sarcosperma arboreum* Benth. & Hook. f., *Shorea assamica* Dyer, *Terminalia myriocarpa* Heurck. & Müell. Arg. and *Toona ciliata* Roem.

The other trees forming the second storey of these forests are *Albizia procera* (Roxb.) Benth., *Altingia excelsa* Noronha, *Bruinsmia polysperma* (C.B. Clarke) Van Steenis, *Castanopsis indica* (Roxb.) DC., *Colona floribunda* Craib, *Dalbergia assamica* Benth., *Dillenia indica* L., *D. pentagyna* Roxb., *Docynia indica* (Wallich) Decne., *Dysoxylum*

*binectariferum* (Roxb.) Beddome, *D. gobara* (Buch. Ham.) Merr., *Flaeocarpus tectorius* (Lour.) Poiret, *Ficus oligodon* Miq., *Kydia calycina* Roxb. var. *glabrescens* (Masters) Deb, *Lithocarpus dealbata* (Hook. f. & Thomson ex Miq.) Rehder, *Magnolia griffithii* Hook. f. & Thomson, *Pithecellobium heterophyllum* (Roxb.) Macbri., *Schima wallichii* (DC.) Korth., *Syzygium cuminii* Skeels, *Terminalia chebula* Retz., *T. citrina* (Gaertn.) Flem. and *Turpinia pomifera* (Roxb.) DC.

The third storey of trees is composed of *Acacia intsia* Willd., *Actephila excelsa* (Dalz.) Müell.-Arg., *Actino daphne obovata* (Nees) Blume, *Alangium chinense* (Lour.) Harms., *Aphanamixis polystachya* (Wallich) Parker, *Beilschmiedia roxburghiana* Nees, *Cinnamomum bejolghota* (Buch.-Ham.) Sweet, *C. tamala* (Spr.) Nees & Eberm. *Croton roxburghii* Balakr., *Drypetes assamica* (Hook. f.) Pax. ex Hoffm., *Ficus semicordata* J.E. Smith, *Garcinia cowa* Roxb. ex DC., *G. tinctoria* (DC.) Wight, *Griffithianthus fuscus* Merr., *Gynocordia odorata* R. Br., *Knema angustifolia* (Roxb.) Warb., *Litsea cubeba* (Lour.) Pers., *L. monopetala* (Roxb.) Pers., *L. salicifolia* (Roxb. ex Nees) Hook. f., *Macropanax undulatus* (Wallich ex G. Don) Seem., *Pithecellobium heterophyllum* (Roxb.) Macbri., *Sterculia hamiltonii* (O. Ktze.) Adelb., *Styrax serrulatum* Roxb. and *Talauma hodgsonii* Hook. f. & Thomson.

Some of the common large shrubs or small trees of this region are: *Aralia armata* (G. Don) Seem., *A. thomsonii* Seem., *Ardisia virens* Kurz, *Boehmeria macrophylla* D. Don, *Brassiopsis globerulata* (Blume) Regel., *Pseudobrassiopsis hispida* (Seem.) R.N. Ban., *Camellia caudata* Wallich, *Coffea khasiana* Hook. f., *Debregeasia longifolia* (Burm. f.) Wedd., *Eurya acuminata* DC., *Ficus auriculata* Lour., *F. fistulosa* Reinw., *Glycosmis arborea* (Roxb.) DC., *Hibiscus fragrans* Roxb., *Ixora nigricans* Wight & Arn., *Maesa indica* (Roxb.) Wallich, *Meyna spinosa* Roxb. ex Link, *Micromelum integerrimum* (Roxb.) Roem., *Microtropis discolor* (Wallich) Arn., *Morinda angustifolia* Roxb., *Murraya paniculata* (L.) Jack., *Myrsine semiserrata* Wallich, *Saurauia armata* Kurz, *S. macrotricha* Kurz, *S. napaulensis* DC., *S. punduana* Wallich, *S. roxburghii* Wallich, *Styrax serrulatum* Roxb., *Syzygium cuneatum* (Duthie) Balakr., *Vernonia volkamerifolia* DC., and *Oreocnide rubescens* (Blume) Miq.

The tropical and subtropical evergreen forests have entangling web of thick lianas, wiry climbers, creepers and weak-stemmed stragglers, viz. *Adenia trilobata* (Roxb.) Engl., *Argyreia argentea* (Roxb.) Choisy, *A. nervosa* (Burm. f.) Boj., *Cayratia japonica* (Thunb.) Gagnep., *Cissus assamica* (Lawson) Craib, *Clematis loureiriana* DC., *Combretum flagocarpum* C.B. Clarke, *C. punctatum* Blume, *Crawfurdia*

*campanulacea* Wallich ex Griffith, *Dioscorea alata* L., *D. pentaphylla* L., *Entada pursaetha* DC. subsp. *sinohimalensis* Grierson & Long, *Erythopalum scandens* Blume, *E. vagum* (Griffith) Mast., *Fissistigma walllichii* (Hook. f. & Thomson) Merr., *Hodgsonia macrocarpa* (Blume) Cong., *Lonicera macrantha* (D. Don) Sprengel, *Mastersia assamica* Benth., *Millettia pachycarpa* Benth., *Paederia scandens* (Lour.) Merr., *Pericampylus glaucus* (Lam.) Merr., *Poikilospermum suaveolens* (Blume) Merr., *Sabia lanceolata* Colebr., *Stemona tuberosa* Lour., *Stephania hernandifolia* (Willd.) Walp., *Tetrastigma bracteatum* (Wallich) Planchon, *T. leucostaphylum* (Dennst.) Balakr., *T. obovatum* (Lawson) Gagnep., *T. rumicispermum* (Lawson) Planchon and *Thladiantha hookerii* C.B. Clarke.

The ground in these forests, due to lofty trees with thick canopy, is dark and moist and has thick layer of humus, and is covered with an array of fleshy fungi and saprophytic flowering plants. The common herbs are, *Andrographis paniculata* (Burm. f.) Nees, *Blumea fistulosa* (Roxb.) Kurz, *B. lanceolata* (Roxb.) Druce, *Begonia aborensis* Dunn, *B. barbata* Wallich ex DC., *B. palmata* D. Don, *B. roxburghii* (Miq.) DC., *Borreria articulata* L.F.N. Williams, *Cardamine hirsuta* L., *Centella asiatica* (L.) Urban, *Chlrita macrophylla* Wallich, *Duchesnea indica* (T. Anderson) Fock., *Emilia sonchifolia* (L.) DC., *Euphorbia hirta* L., *Exacum tetragonum* Roxb., *Gynura crepidioides* Benth., *Hedyotis verticillata* (L.) Lam., *Hygrophyla salicifolia* (Vahl) Nees, *Hypoestes triflora* Roem & Shult., *Impatiens bella* Hook. f. & Thomson, *I. latiflora* Hook. f. & Thomson, *I. tripetala* DC., *Knoxia mollis* R. Br., *Limnophila chinensis* (Osb.) Merr., *Lobelia angulata* Forst., *Lobelia montana* Reinw. & Blume, *Mosla dianthera* (Buch. Ham. ex Roxb.) Maxim., *Oenanthe thomsonii* C.B. Clarke, *Ophiorrhiza argentea* (Hook. f.) Balakr., *Plantago erosa* Wallich, *Phyllanthus urinaria* L., *Polygonum posumbu* Buch. - Ham. ex D. Don, *Ranunculus cantoniensis* DC., *Rhynchosyllum obliquum* Blume, *Sarcopyramis nepalensis* Wallich, *Securingea virosa* (Roxb. ex Willd.) Baill., *Spilanthes paniculata* Wallich ex DC., *Stellaria media* (L.) Vill., *Torenia diffusa* D. Don and *Viola diffusa* Ging, while some of the common grasses and sedges along the way side thickets are: *Arundinella nepalensis* Trin., *Arundo donax* L., *Carax filicina* Nees, *Coix lacrymajobi* L., *Cyperus brevifolius* (Retz.) Hassk., *C. diffusus* Vahl, *C. kyllingia* Endl., *C. sanguinolentus* Vahl, *Fimbristylis dichotoma* (L.) Vahl, *F. schoenoides* (Retz.) Vahl, *Garnotia acutigluma* (Steud.) Ohwi, *Imperata cylindrica* (L.) P. Beauv., *Isachne albens* Trin., *Microstegium ciliatum* (Trin.) A. Camus, *Oplismenus compositus* (L.) P. Beauv., *Phragmites karka* (Retz.) Steud., *Pogonatherum crinitum* (Thunb.) Kunth, *Sacciolepis mysoroides* (R. Br.) A. Camus., *Scirpus juncooides* Roxb., *Setaria pallidifusca* (Schum) Stapf & Hubb. and *Themeda villosa* (Poiret) A. Camus.

Epiphytes and other climbers are a common sight. The common ones are *Aeschynanthes acuminata* DC., *A. hookeri* C.B. Clarke, *A. superba* C.B. Clarke, *Agapetes variegata* D. Don, *Piper clarkei* C.D.C., *P. hymenophyllum* Miq., *P. mannii* C. DC., *P. sylvaticum* Roxb., *P. thomsonii* (C. DC.) Hook. f., *Pothos cathcartii* Schott, *P. scandens* L., *Procris crenata* C.B. Robinson, *Rhaphidophora grandis* Schott., *R. hookeri* Schott and *Schefflera venulosa* (Weight & Arn.) Harms.

The study of the orchid flora of this proposed Biosphere merits separate treatise. They form the largest group of flowering plants because of the congenial conditions such as high humidity and rainfall, diversity of habits and habitats, etc. Nearly 100 species could be collected from the small portion of the area. Some of the common terrestrial ones belong to the genera *Arundina*, *Calanthe*, *Goodyera*, *Habenaria*, *Hetaeria*, *Phaius*, *Tainia* and *Tropidia*. But epiphytic orchids outnumber the terrestrial ones with the species of the genera *Bulbophyllum*, *Cleisostoma*, *Coelogyne*, *Dendrobium*, *Eria*, *Oberonia* and *Pholidota* are well represented in the area. It may be emphasized here that every single tree represents a natural orchidarium, as from a single felled tree more than 29 species of orchids, distributed in 9 genera, were recorded. A thorough survey of this group may bring to light many orchids of ornamental value hitherto untapped for hybridization programme and multiplication through tissue culture for their commercial exploitation.

The forests along the Jairampur-Nampong road has tropical evergreen vegetation and the trees are covered with lichens, climbers and epiphytes. *Talauma hodgsoni* Hook. f. & Thomson, *Gynocardia odorata* R. Br., *Syzygium cumini* (L.) Skeels, *Knema angustifolia* (Roxb.) Warb., *K. linifolia* (Roxb.) Warb., *Saurauia napaulensis* DC., *S. punduana* Wallich, *Ardisia griffithii* C.B. Clarke, *Cinnamomum pauciflorum* Nees are the common trees. *Rhaphidophora* sp., *Agapetes* sp., *Aeschynanthus* sp., *Hoya* sp., and *Bauhinia* sp. are the common epiphytes and climbers.

At Jairampur trees like *Cinnamomum pauciflorum* Nees, *C. tamala* Nees & Ebern., *Litsea monopetala* Pers., *Syzygium cumini* (L.) Skeels, *Gynocardia odorata* R. Br., *Phoebe lanceolata* Nees, *Terminalia myriocarpa* Heurck & Müell.-Arg., *Quercus lanceaefolia* Roxb., *Styrax serrulatum* Roxb., *Ardisia griffithii* C.B. Clarke, *Elaeocarpus* sp., predominate. In the localities where the forests have been denuded due to biotic interferences, *Kydia calycina* Roxb., *Vitex heterophylla* Roxb., *Stereospermum personatum* (Hassk) Chatter., *Duabanga grandiflora* (Roxb.) Walp., *Bischofia javanica* Blume, *Sterculia indica* Merr., are found occasionally as trees, while *Litsea cubeba* (Lour.) Pers., *Ardisia virens* Kurz, *Psychotria monticola* Kurz, *Antidesma bunius* Sprengel,

*Ahroma augusta* L., *Mussaenda roxburghii* Hook. f., *Leea umbraculifera* C.B. Clarke, etc. are common shrubs. *Costus speciosus* (Koenig) Smith, *Alpinia allughas* Rose., *Polyura geminata* Hook. f., *Begonia* sp., *Forrestia mollissima* (Blume) Koorders var. *hispida* (Less. & Rich.) Baker, *Commelina paludosa* Blume, *Pollia haskartii* Rolla Rao, *Amomum linguiforme* (Roxb.) Benth., *Phrynium placentarium* (Lour.) Merr., *Elatostema surculosa* Wight, *Spiradiclis biflora* Wallich ex Kurz, *Lobelia angulata* Forst., *Boeica filiformis* C.B. Clarke, *Boeica multiflorum* R. Br., are predominant amongst the herbs. *Bauhinia khasiana* Baker, species of *Piper*, *Dioscorea*, *Stephania*, *Gynostemma*, *Trichosanthes* are the common climbers. *Livistona jenkinsiana* Griffith, *Wallichia caryotioides* Roxb., *W. triandra* (Joseph) S.K. Basu, *Calamus erectus* Roxb., *C. floribundus* Griffith are some of the palms. Wild banana, viz. *Ensete glaucum* (Roxb.) Cheesman and *M. velutina* Wendl. & Drude, etc. are very common in patches along the slopes of the forests which have been subjected to biotic interference.

Vegetation along the Myanmar boarder was studied at Manmod road, Chennhang, Noglo and Lunwa areas. *Swietenia mahagoni* Jacq., with tall, erect bole and umbrageous crown, dominates the vegetation at Noglo while it is absent in other places. *Aucuba himalaica* Hook. f. is very common and forms large consociations in all these places, while *Acer laevigatum* Wallich, *Alnus nepalensis* D. Don, *Baliospermum montanum* Muell.-Arg., *Brassaiopsis glomerulata* (Blume) Regel, *Casaeria kurzii* C.B. Clarke, *C. vareca* Roxb., *Drypetes ulata* (Beddome) Pax & Hoffm., *Elaeocarpus sphaericus* (Gaertn.) K. Schum., *Lithocarpus fenestratus* (Roxb.) Rehder, *Litsea lancifolia* (Roxb. ex Nees) Wallich ex Hook. f., *L. monopetalu* (Roxb.) Pers., *L. semecarpifolia* (Wallich) Hook. f., *Myrsine semiserrata* Wallich etc. are other common trees while amongst the shrubs, *Alangium chinense* (Lour.) Harms., *Buddleja asiatica* Lour., *B. macrostachya* Benth., *Dichroa febrifuga* Lour., *Embelia vestita* Roxb., *Hydrangea aspera* D. Don subsp. *robusta* (Hook. f. & Thomson) Mc Clintock, *Itea macrophylla* Wallich, *Lindera neesiana* (Wallich ex Nees) Kurz, *Ligustrum robustum* (Roxb.) Blume, *Merillioanax listeri* (King) Li, *Psychotria montana* Blume, *Rourea minor* (Gaertner) Leenh., *Saurauia macrotricha* Kurz ex Dyer and *Viburnum odoratissimum* Ker. etc. are commonly seen.

*Actinidia callosa* Lindley, *Aristolochia platanifolia* Duchart, *Bauhinia tenuiflora* Watt ex C.B. Clarke, *Chonemorpha griffithii* Hook. f., *Dioscorea alata* L., *D. pentaphylla* L. *Illigera villosa* C.B. Clarke, *Lonicera macrantha* (D. Don) Sprengel, *Melodinus khasianus* Hook. f., *M. monogynus* Roxb., *Periploca calophylla* (Wight) Falc., *Rubia sikkimensis* Kurz, *Smilax zeylanica* L., *Streptolirion volubile* Edgew.

and *Trachelospermum axillare* Hook. f., are the most common climbers. A rare gymnosperm *Gnetum gnemon* L. is also seen in certain areas of these primary forests. Predominant herbs are *Begonia* sp., *Calamintha umbrosa* (Bieb.) Benth., *Cardamine* sp., *Chirita pumila* (Dietr.) D. Don, *Disporum cantoniense* (Lour.) Merr., *Hemiphragma heterophylla* Wallich, *Impatiens* spp., *Lysimachia ferruginea* Edgew., *Oenanthe thomsonii* C.B. Clarke, *Ophiorhiza* sp., *Polygonum* sp., *Ranunculus pennsylvanicus* L. f. subsp. *napaulensis* (DC.) Riedl., *Sanicula elata* Buch. Ham. ex D. Don, *Vaccinium vacciniaceum* (Roxb.) Sleum, etc., while *Aeschynanthes bracteatus* Wallich ex DC., *A. parasiticus* (Roxb.) Wallich, *Lysionotus serratus* D. Don, *Pothos* sp., *Rhaphidophora* sp. are the common weak climbers.

### FLORISTICS AND PHYTOGEOGRAPHY

The flora of Namdapha National Park is very luxuriant and shows maximum diversity. It supports several endemics that have evolved locally or have survived only due to protective natural barriers. Trees with tall boles form dense canopy at the top making the collection very difficult from such trees. Interestingly the plants, like *Cinnamomum glaucescens*, *Dipterocarpus retusus*, *Shorea assamica* and *Terminalia myriocarpa*, which grow profusely at lower altitude near Miao and Deban, show their distribution up to 65 mile on Miao-Vijoyagar road. These taxa are totally absent near Gandhigram towards Myanmar border. Other interesting plants, such as *Sapria himalayana*, *Rhopalocnemis phalloides* are found near 40th mile and Kumaon Bum forest area, while *Balanophora dioica* show's its maximum population at 1800 m altitude towards Kumaon Bum from Gandhigram. *Rhododendron* spp. *Betula*, *Quercus* spp. are also found in Kumaon Bum forest area. Occasionally, *Peliosanthes* and *Primula* are also seen there. *Pinus merkusii*, a Burmese pine, is found in the Kulung and Lati valley at higher elevation.

As far as the phytogeographical relationship and affinities of the flora of Namdapha are concerned, these show greater affinity with Indo-Malayan flora. Besides, it also harbours the plants of other regions of India, as also adjoining as well as far off countries. According to Good (1947), India, along with the continental South-east Asian region, falls under the palaeotropical kingdom and Indo-Malaysian sub-kingdom. Chatterjee (1962) found Good's treatment of the provinces of India unsatisfactory and differed with him in putting together the moist area of eastern Assam and dry area of Upper Myanmar under one province. On the basis of distribution of flora, the Indian subcontinent has been subdivided into various botanical or floristic provinces by C.B. Clarke (1898), Hooker (1906), Chatterjee (1939) and Razi (1955). It is evident

from their treatment that these floristic limits are subjective and not very precise, and correspond fairly well with the limits of vegetation types.

The phytogeographical accounts of Indian subcontinent and its different regions are discussed by several other authors (Meher-Homji and Mishra, 1973; Mani, 1974; Rao, 1974) as well and most of them are of the opinion that the flora of Upper Assam (Arunachal Pradesh) shows great affinities to the flora of Indo-China, apart from its rich endemism.

The information about the number of species and their distribution in the area is comparatively better known now. The present studies reveal that there are *ca* 73 taxa of Lichens, 59 of Hepaticae (Bryophytes), 112 of Pteridophytes, 5 of Gymnosperms and *ca* 870 of Angiosperms in this reserve. Undoubtedly, these numbers will go up as more areas are surveyed. Still, it is worthwhile to record and analyse the information that has accumulated so far and draw a preliminary account on the phytogeography of Namdapha. The statistical analysis of the flora (i.e. species, genera and families) is given in table-1.

TABLE - 1 :

The Floristic Analysis of Namdapha Proposed Biosphere Reserve

	Dicots	%	Monocots	%	Lichens	Hepat- icae	Pterido- phytes	Gymno- sperms
Families (215)	119	86.1%	19	13.9%	17	21	36	3
Genera (639)	403	78.4%	111	21.6%	34	33	54	4
Species (1119)	674	77.6%	196	22.4%	73	59	112	5

The proportion of monocots to dicots is 1 : 3.5 and genera to species is 1 : 1.66. Taking into account the entire Indian subcontinent including Malaya, Hooker (1906) has estimated portion of monocots to dicots as 1 : 2.3 and genera to species 1 : 7. This major difference in the present finding shows the richness and uniqueness of the vegetation of that area. Only *ca* 70% of the total area of the Biosphere Reserve could be explored so far and the floral elements of temperate and alpine regions are still untouched and could not be worked out due to several reasons.

An analysis of 10 major families of flowering plants with their respective genera and species has been given in descending order in Table-2, to show the richness and diversity of the flora of proposed

Namdapha Biosphere Reserve. Families like Orchidaceae, Rubiaceae and Poaceae are well represented. Besides, a comparison of this sequence (Table-3) with those given by Hooker (1906) for Flora of British India has revealed some interesting findings with both similarities and dissimilarities. The family Orchidaceae occupies the first position in both, while other families show considerable variation in their positions. It is probably due to incomplete inventory of the flora of that area at present. It is very interesting to note that replacement of Lamiaceae by Acanthaceae shows the rich gene pool of Phlogacanthus and its allied

TABLE - 2 :

The Largest Ten Families

Families	Genera	Species
Orchidaceae	35	82
Rubiaceae	31	59
Urticaceae*	13	39
Leguminosae*	22	39
Poaceae*	28	33
Euphorbiaceae	22	32
Asteraceae	19	24
Cyperaceae	7	20
Acanthaceae	11	18
Gesneriaceae	8	15

\*The families Fabaceae, Caesalpinaceae, Mimosaceae, Moraceae, Urticaceae, Bambusaceae and Poaceae though treated separately are kept here under the families Leguminosae, Urticaceae and Poaceae for comparison.

TABLE - 3 :

The Largest Ten Families

Flora of Proposed Namdapha Biosphere :	Flora of British India
Orchidaceae	Orchidaceae
Rubiaceae	Leguminosae
Leguminosae*	Poaceae
Urticaceae*	Rubiaceae
Poaceae*	Euphorbiaceae
Euphorbiaceae	Acanthaceae
Asteraceae	Asteraceae
Cyperaceae	Cyperaceae
Acanthaceae	Lamiaceae
Gesneriaceae	Urticaceae

\*The families Fabaceae, Caesalpinaceae, Mimosaceae, Moraceae, Urticaceae, Bambusaceae and Poaceae though separately treated are kept here under the families Leguminosae, Urticaceae and Poaceae for comparison.

species in the proposed Biosphere.

So far the richness and genetic diversity of the flora of the proposed Namdapha Biosphere Reserve is concerned, it may be mentioned here that many taxa, hitherto reported rare and endemic to Assam, Manipur, Meghalaya and Nagaland, could also be collected from Namdapha. Even few of them are growing profusely in this reserve forest area, namely *Aeschynanthus superba* C.B. Clarke, *Angiopeteris evecta* (Forst.) Hoffm., *Bruinsmia polysperma* (C.B. Clarke) V. Steenis,



*Cheirostylis pusilla* Lindley, *Christensenia aesculifolia* (Blume) Maxon, *Cyathea gigantea* (Wallich ex Hook.) Holttum, *Arundina graminifolia* (D. Don) Hochr., *Diplomeris pulchella* D. Don, *Gnetum ula* Brogn., *Glycosmis cymosa* (Kurz) Narayanaswamy, *Impatiens porrecta* Hook. f. & Thomson, *Iodes hookeriana* Baill., *Phlegmariurus phlegmaria* (L.) Sen & Sen, *Magnolia griffithii* Hook. f. & Thomson, *M. pterocarpa* Roxb., *Oxyspora cernua* (Roxb.) Triana, *Pentasacme wallichii* Wight, *Psilotum nudum* (L.) P. Beauv., *Pteracanthus nobilis* (C.B. Clarke) Bremek., *Pseudobrassaiopsis hispida* (Seem.) R.N. Ban., *Tetrastigma obovatum* (Lawson) Gagnepain, etc. It may be emphasized here that, the proposed Biosphere Reserve hosts rich gene pool of genetic diversity of several rare and endangered taxa which are being depleted rapidly or are on the verge of extinction due to many socio-economic developmental projects and Jhum cultivation in other parts of N.E. Region.

Apart from that, many primitive flowering plants, viz. *Exbucklandia*, *Houttuynia*, *Kadsura*, *Magnolia*, *Talauma* and many species of the Annonaceae, Lauraceae, Myrsinaceae, Piperaceae, etc. are also found in the proposed Biosphere Reserve. Apart, many taxa of nearby Sino-Himalayan, Bhutan, Myanmar, Malaysian and, to a lesser extent, with peninsular Indian affinity could also be collected from this area probably because they belong to biogeographically a single natural mountain land, the 'Indo-Chinese sub-region' (Mani, 1974). These affinities are best illustrated by an enumeration of some of the common elements. The Chinese, Bhutanese and Himalayan genera, found in the proposed Namdapha Biosphere, are: *Actinidia*, *Anthocephalus*, *Bruinsmia*, *Bulbophyllum*, *Camellia*, *Cymbidium*, *Epigenium*, *Kadsura*, etc. and many other species belonging to different genera. Of the Malayan elements occurring in Namdapha are genera like: *Balanophora*, *Engelhardtia*, *Exbucklandia*, *Milliusa*, *Rubus*, *Talauma*, *Vaccinium*, etc.

The flora of the proposed Biosphere Reserve has significant affinities with peninsular India and this is shown by discontinuous distribution of *Butea parviflora* Roxb. ex DC., *Cissampelos pareira* L., *Dillenia indica* L., *D. pentagyna* Roxb., *Eurya mitida* Korth., *Elatostema platyphyllum* Wedd.,

*Entada purseatha* DC. subsp. *sinohimalensis* Grierson & Long, *Garcinia cowa* Roxb. ex DC., *Hydrocotyle javanica* Thunb., *Kadsura heteroclita* (Roxb.) Craib, *Leea edge-worthii* Santapau, *Mesua ferrea* L., *Meliosma simplicifolia* (Roxb.) Walp., *Pavetta indica* L., *Trichosanthes tricuspida* Lour. etc. which occur in peninsular India as well as proposed Namdapha Biosphere Reserve through Assam and Meghalaya.

The floristic analysis of Lichens and Hepataceae (Bryophytes) have been shown in Table-IV & V respectively. However, the results presented here are very preliminary in nature and may turn out to be the proverbial "tip of an iceberg" in the ultimate analysis once the entire area is thoroughly botanised. The floral collections of Pteridophytes and Gymnosperms can be grouped in terms of family, genera, species and their rarity etc. as shown in Table-VI. Certain species of these groups are banned or restricted and need special export permit. The specimens collected from the Namdapha Reserve area have been deposited in Kanjilal herbarium, ASSAM, wherever, the live plants or museum specimens have been collected in such cases field numbers have not been provided in the text.

TABLE - IV :

## Floristic Analysis of Lichens

Family	Genera	Species
Arthoniaceae	1	1
Opogonaceae	2	3
Strigulaceae	3	5
Clathroporiaceae	1	6
Peltigeraceae	1	2
Collemaaceae	2	5
Coccocarpiaceae	1	2
Bacidiaceae	1	3
Ectolechiaceae	3	5
Gomphillaceae	2	3
Asterothyriaceae	1	2
Pilocarpaceae	3	6
Parmeliaceae	6	13
Usneaceae	1	3
Ramalinaceae	1	1
Cladoniaceae	1	5
Physciaceae	4	8
Total : 17	34	73

TABLE - V :

## Floristic Analysis of Hepaticae (Bryophyta)

Family	Genera	Species
Leptozetaceae	1	5
Calyptogoniaceae	1	2
Cephalozziaceae	1	1
Jackiellaceae	1	1 (1+2 var.)
Lophozziaceae	1	1
Jungermanniaceae	2	5
Geocalycaceae	2	2
Radulaceae	1	2
Porellaceae	1	3 (+1 var.)
Jubulaceae	1	3
Isoetesaceae	7	10
Possombronaceae	1	2
Pelliaceae	1	1
Pallaviciniaceae	1	1
Aneuraceae	2	5
Targioniaceae	1	1
Conocephalaceae	1	1
Rebouliaaceae	2	2
Marchantiaceae	2	3
Ricciaceae	1	1
Anthocerotaceae	2	2 (+1 asp.)
Total : 21	33	54 (+3 var. & 1asp.)

Due to the uniqueness and species diversity of the floral elements met in the proposed Namdapha Biosphere Reserve, it has been identified

as one of the important 'HOT SPOT' area of the country. It is imperative to mention here that a number of rare, endangered and threatened taxa ;

TABLE - VI :

Floristic Analysis of Pteridophytes and Gymnosperms.

Families	Genera	Species	Rare / Banned
Huperziaceae	2	3	B
Lycopodiaceae	1	1	B
Selaginellaceae	1	5	—
Equisetaceae	1	2	—
Psilotaceae	1	1	B
Angiopteridaceae	1	1	B
Polypodiaceae	12	26	—
Dipteridaceae	1	1	R
Drynariaceae	1	1	R
Lygodiaceae	1	2	—
Cheilantheaceae	2	2	—
Marattiaceae	1	1	—
Cryptogrammeae	1	1	—
Pteridaceae	1	10	—
Adiantaceae	1	3	—
Hemionitidaceae	2	2	—
Antrophyaceae	1	3	—
Vittariaceae	1	4	—
Hymenophyllaceae	2	3	—
Dicksoniaceae	1	1	R
Cyatheaceae	1	3	B
Dennstaedtiaceae	1	2	—
Pteridiaceae	1	1	—
Lindsaeaceae	1	2	R
Aspleniaceae	1	9	—
Athyriaceae	2	5	—
Aspidiaceae	1	2	—
Dryopteridaceae	2	5	—
Lomariopsidaceae	1	1	R
Bolbitidaceae	1	1	—
Nephrolepidaceae	1	1	R
Oleandraceae	1	1	—
Davalliaceae	1	2	—
Blachnaceae	2	2	—
Salviniaceae	1	1	R
Pinaceae	2	2	R
Cephalotaxaceae	1	1	—
Gnetaceae	1	2	R / B
Total 39	58	117	

R Rare

B : Banned

two new genera ; four new species ; three new records for India and fourteen new distributional records have been recorded so far.

## LICHIENS

(*K.P. Singh*)

### ARTHONIACEAE

***Cryptothecia candida*** (Kremph.) Sant. Symb. Upsal. 12 (1) : 65. 1952 ; Makhija & Patw. Biovigyanam, 11 (1) : 5. 1985. *Myriostigma candidum* Kremph. Nuov. Giorn. Bot. Ital. 7: 45. 1875.

Thallus whitish grey ; ascigerous part irregular, slightly raised, foveolate. Asci bitunilate, 8 spored; spores muriform, 35 50 × 12 12  $\mu$ m.

Habitat : Follicolous in moist places ; 40th mile, *K.P. Singh* 53.

*Distrib.* : INDIA : West Bengal ; Pantropical but more common in tropical AMERICA and MALAYSIA and scarce in tropical AFRICA.

### OPEGRAPHACEAE

***Mazosia melanophthalma*** (Müell. Arg.) Sant. Symb. Bot. Upsal. 12(1) : 117. 1952. Sinha & Singh in Geophytology, 17(2) : 178. 1978. *Opegrapha melanophthalma* Müell. Arg. Flora, 66 : 348. 1888.

Thallus greenish grey to yellowish brown, verruculose. Ascocarps rounded, immersed at base with a distinct margin ; sides sloping, up to 0.6 mm in diam. ; spores transversely 3 septate, 15 20 × 3 5  $\mu$ m. Paraphyses anastomosed.

Habitat : Follicolous in moist shady places. Miao, *K.P. Singh* 11 & 22.

*Distrib.* : INDIA : Andaman Islands, Nagaland, Tamilnadu ; Pantropical regions of World.

***Mazosia phyllosema*** (Nyl.) Zahlbr., Cat. Lich. Univ. 2: 503. 1924; Sinha & Singh in Geophytology 17: 178. 1987. *Platygrapha phyllosema* Nyl. Bull. Soc. L. Normand. Ser. 2. 7 : 171. 1873.

Thallus brownish grey, smooth. Ascocarps black rounded, immersed at base, 0.2 0.6 mm in diam. ; spores fusiform, transversely 3 - septate, 18 - 40 × 3 5  $\mu$ m. Paraphyses anastomosed.

Habitat : Follicolous in moist open places.

Miao, *K.P. Singh*, F 3, 21 & 23 ; 40th mile, *K.P. Singh* F 51.

*Distrib.* : INDIA : Andaman Islands, Nagaland and Tamilnadu ;  
Pantropical regions of the World.

**Opegrapha filicina** Mont. in Sagra, Hist. Cuba, Botan. 9(2) :  
42. 1838 - 42 ; Sinha & Singh in Geophytology 17(2) : 178. 1987.

Thallus greenish grey, smooth. Ascocarps linear, up to 1 mm  
long, black ; excipuloid tissue brownish black, open ; spores trans-  
versely 3 - 5 septate,  $15 - 22 \times 4 \mu\text{m}$ . Paraphyses anastomosed.

*Habitat* : Follicolous in moist places.

40th mile, K.P. Singh F 65 A, 73 & 75.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; tropical and sub-  
tropical AMERICA and AFRICA.

### STRIGULACEAE

**Phylloblastia dolichospora** Vain., Ann. Acad. Sci. Fenn. ser. A,  
15 : 323. 1921.

Perithecia black, constricted below, 0.2 - 0.3 mm diam., wall  
black. Paraphyses branched, sterile.

*Habitat* : Follicolous in moist place, scarce.

Miao, K.P. Singh F 16 A.

*Distrib.* : INDIA : Andaman Islands ; AFRICA, MALAYSIA.

**Strigula elegans** (Fèe) Müell. Arg., Flora, 63 : 41. 1880 ; Sinha  
& Singh in Geophytology 17 (2) : 178. 1987. *Phyllocharis elegans* Fèe  
Essai Crypt. Ecorc. Officin. Paris, 94 and 100. 1824.

Thallus subcuticular, greyish green. Perithecia partially immersed  
with well developed involucrellum, 0.3 - 0.4 mm in diam. ; spore  
transversely bicelled, two spore cells equal in size,  $9 - 12 \times 2 - 3 \mu\text{m}$ .

*Habitat* : Follicolous in open places.

Miao, K.P. Singh, F 9 ; 40th mile K.P. Singh F 54 A

*Distrib.* : INDIA : Andaman Islands, Assam, Nagaland,  
Tamilnadu, Uttar Pradesh ; Pantropical regions.

**Strigula nemathora** Mont. in Sagra, Hist. Cuba Botan., p. 143.  
1838-42 (Non Nyl.) ; Awasthi & Singh in Geophytology  
3(1) : 24. 1973.

Thallus subcuticular, margin papillate. Perithecia immersed, involucrellum indistinct; spores  $15 - 20 \times 4 - 5 \mu\text{m}$ .

*Habitat* : Follicolous in open places.

40th mile, *K.P. Singh* F 77 A.

*Distrib.* : INDIA : Andaman Islands, Nagaland, Tamilnadu ; Pantropical regions.

**Strigula subelegans** Vain., Ann. Acad. Sci. Fenn. ser A, 15 : 23. 1923 ; Sinha & Singh in Geophytology 17(2) : 179. 1987.

Thallus subcuticular, margin not papillate. Perithecia partially immersed ; spores  $15 - 20 \times 3 - 4 \mu\text{m}$  ; two spore cells unequal in size.

*Habitat* : Follicolous in open place.

Miao, *K.P. Singh* 12

*Distrib.* : INDIA : Andaman Islands, Nagaland, Tamilnadu; CENTRAL AMERICA, MALAYSIA, WEST INDIES.

**Trichothelium epiphyllum** Müell. Arg., Bot. Jahrb. 6 : 418. 1885 ; A. Singh in Prog. Pl. Res. 1 : 47. 1979.

Perithecia black, covered by star like 8 - 12 black setae, 0.2 - 0.3 mm in diam. ; spores transversely 7 septate, bacillar,  $30 - 45 \times 4 - 6 \mu\text{m}$ .

*Habitat* : Follicolous in open moist places.

40th mile, *K.P. Singh* F 51 B, 58 A & 68.

*Distrib.* : INDIA : Andaman Islands ; Pantropical region.

### CLATHROPORINACEAE

**Porina cupreola** (Müell. Arg.) Schilling, Hedwigia, 67 : 274. 1927 ; Sinha & Singh in Geophytology 17(2) : 179. 1987. *Phylloporina cupreola* Müell. Arg., Hedwigia, 30 : 189. 1981.

Perithecia yellowish brown, 0.2 - 0.3 mm diam., base spreading, outer perithecial wall brown, inner wall colourless, crystalline layer absent ; spores 7 septate,  $25 - 30 \times 3 \mu\text{m}$ .

*Habitat* : Follicolous in open moist place.

40th mile, *K.P. Singh* 57 D.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; FRENCH INDO-CHINA.

**Porina epiphylla** (Fée) Fée, Essai. Crypt. Ecorc. Officin. II. Supplement & Revision, Paris. 76. 1837 ; Sinha & Singh in Geophytology 17 (2) : 179. 1987. *Porina americana* Fée var. *epiphylla* Fée in Diction. Class. Hist. Nat. 17 (Atlas) Paris, 26 & pl. 48, fig. 4. 1831.

Perithecia pale brown, hemispherical, 0.3 - 0.4 mm in diam.; base spreading ; outer wall pale; inner wall colour-less ; crystalline layer present ; spores 7 - spatulate, 18 - 40 × 3 - 4 μm.

*Habitat* : Foliicolous in open moist places.

Miao, *K.P. Singh* F 3, F 23 ; 40th mile, *K.P. Singh* F. 51

*Distrib.* : INDIA : Andaman Islands, Nagaland, Tamilnadu ; Pantropical regions of the World.

**Porina fulvella** Müell. Arg., Flora, 66 : 335. 1883 ; Awasthi & Singh in Geophytology 3(1) : 21. 1973.

Perithecia dark reddish brown, 0.2 - 0.3 mm in diam. ; base spreading, not covered by crystal layer, involucrellum with an algal layer below ; spores transversely 3 septate. 15 - 20 × 3 μm.

*Habitat* : Foliicolous in moist places.

Miao, *K.P. Singh* F 10 ; 40th mile, *K.P. Singh* F 49.

*Distrib.* : INDIA : Tamilnadu ; TROPICAL SOUTH AMERICA, AFRICA, SOUTH EAST ASIA.

**Porina monocarpa** (Kremph.) Schilling in Hedwigia, 67 : 274. 1927 ; Sinha & Singh in Geophytology 17 (2) : 179. 1987. *Verrucaria monocarpa* Kremph. in Nuov. Giorn. Bot. Ital. 7 : 63. 1875.

Perithecia reddish brown, lens shaped, 0.3 - 0.4 mm in diam., base spreading, outer wall reddish yellow, covered by algal layer; inner wall colourless ; spores transversely 5 septate, 18 - 25 × 4 - 5 μm.

*Habitat* : Foliicolous in moist place.

Miao, *K.P. Singh* F 8.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; JAVA, PHILIPPINES, SINGAPORE.

**Porina nitidula** Müll. Arg. in Flora, 66 : 336. 1883 ; Sinha & Singh in Geophytology 17 (2) : 179. 1987.

*Perithecia* black, globose, 0.2 - 0.25 mm in diam., base constricted, not covered by crystal layer, perithecial wall not differentiated, black above, brownish below ; spores transversely 5 - septate,  $20 - 27 \times 3 - 5 \mu\text{m}$ .

*Habitat* : Follicolous in moist shady places.

40th mile, K.P. Singh F 48 B, F 52 B - F 54 C.

*Distrib.* : INDIA ; Andaman Islands, Nagaland, Tamilnadu ; Pantropical regions of the World.

*Porina phyllogena* Müell. Arg. in Flora, 66 : 335, 1883 ; Sinha & Singh in Geophytology 17 (2) : 181, 1987.

*Perithecia* black, ca 4 mm across ; conical, base spreading ; wall differentiated, outer wall black, inner wall brownish ; spores transversely 1 - septate,  $9 - 15 \times 3 \mu\text{m}$ .

*Habitat* : Follicolous in moist places.

Miao, K.P. Singh F 16 B ; 40th mile, K.P. Singh F 57 B.

*Distrib.* : INDIA : Andaman Islands, Nagaland ; Pantropical regions of the world.

### PELTIGERACEAE

*Peltigera dolichorrhiza* (Nyl.) Nyl., Lich. Nova. Zealand, 43, 1888 ; Awasthi & Joshi in Kavaka, 10 : 51, 1982. *Peltigera polydactyla* var. *dolichorrhiza* Nyl., Syn. Lich. 1 : 327, 1860.

Thallus irregularly spreading, pale brown to brownish black ; lobes 5 - 20 mm wide, margin wavy, sinuous lobulate, without isidia and soredia, tomentose, lower side brown with reticulate veins. Apothecia on extended lobules ; spores transversely 5 - 6 septate, acicular,  $30 - 70 \times 3 - 4 \mu\text{m}$  ; tenuiorin and dolichorrhizin present.

*Habitat* : On ground in moist shady places.

Miao, K.P. Singh 67.

*Distrib.* : INDIA : Arunachal Pradesh, Himachal Pradesh, Meghalaya, Nagaland, Sikkim, Uttar Pradesh, West Bengal ; Palaeo tropical regions of the World.

*Peltigera rufescens* (Weis.) Hurnb., Fl. Frib. Spec. 2, 1793 ; Awasthi & Joshi in Kavaka, 10 : 60, 1982. *Lichen caninus* var. *rufescens* Weis., Plant. Crypt. Fl. Goetting 79, 1770.



Thallus closely attached to the substratum, dark brown when dry and olivaceous when wet ; lobes 5 - 8 mm wide without isidia and soredia, tomentose ; lower side pale brown with  $\pm$  parallel veins. Apothecia vertical on lobules ; spores acicular, transversely 5 -7 - septate,  $40 - 65 \times 3 \mu\text{m}$ .

*Habitat* : On ground in moist place.

Miao forest, *K.P. Singh* 204.

*Distrib.* : INDIA : Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal ; Cosmopolitan.

### COLLEMATACEAE

***Collema pulcellum*** Ach. var. *subnigrescens* (Müell. Arg.) Degelius. Symb. Bot. Upsal in 20 (2) : 173. 1974. *Synechoblastus flaccidus* var. *subnigrescens* Müell. Arg. in Proc. R. Soc. Edinburgh. 4 : 456. 1882.

Thallus membranaceous, dark olive green ; lobes imbricate, up to 1.5 mm wide, ridged, not fenestrate, without isidia. Apothecia numerous with constricted base, up to 2 mm in diam. ; spores fusiform, transversely 6 - 8 - celled,  $25 - 55 \times 6 - 8 \mu\text{m}$ .

*Habitat* : On trees in moist place.

Deban river area, *K.P. Singh* 699.

*Distrib.* : INDIA : Jammu & Kashmir, Himachal Pradesh, Manipur, Tamilnadu, Uttar Pradesh, West Bangal; AUSTRALIA, BRITIS HONDURAS, CHINA, ETHIOPIA, FLORIDA, FRENCH GUINEA, INDONESIA, JAPAN, KENYA, PHILIPPINES, SRI LANKA, UGANDA.

***Leptogium austro - americanum*** (Malme) Dodge, Ann. mo. Bot. gard. 20 : 419. 1933 ; Awasthi & Akhtar in Geophytology 8 (2) : 192. 1979. *Leptogium cyanescens* var. *austroamericanum* Malme in Ark. Bot. 19 (8) : 11. 1924.

Thallus dark grey when dry, olive green when wet, lobes orbicular, wrinkled, isidiate. Isidia globular to squamuliform.

*Habitat* : On trees in moist places.

Miao forest, *K.P. Singh* 208.

*Distrib.* : INDIA : Manipur, Kerala, Uttar Pradesh ; NORTH, CENTRAL AND SOUTH AMERICA, EUROPE.

**Leptogium cyanescens** (Rabenh.) Korb., Syst. Lich. Germ. 420. 1885 ; Awasthi & Akhtar in Geophytology 8 (2) : 195. 1979. *Collema cyanescens* Rabenh. Deutschl. Kryp. Fl. 50. 1845.

Thallus lead grey when dry, olivaceous ashy green, swollen when wet ; lobes smooth, isidiate. Isidia laminal to marginal, simple to branched.

*Habitat* : On trees in shady place.

Deban, K.P. Singh 211.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Himachal Pradesh, Manipur, Maharashtra, Tamilnadu; Tropical and temperate regions of the World.

**Leptogium denticulatum** Nyl. in Ann. Aci. Nat. Bot. 5, ser. 7 : 302. 1867 ; Awasthi & Akhtar in Geophytology 8 (2) : 196. 1979.

Thallus dark grey, lobes smooth, isidiate. Isidia laminal, squamuliform.

*Habitat* : On ground in moist place,

36th mile, K.P. Singh 763.

*Distrib.* : INDIA : Kerala, Maharashtra, Manipur, Tamilnadu, West Bengal ; Tropics of the New World.

**Leptogium ulvaceum** (Pers.) Vain. in Ann. Acad. Sci. Fenn. ser. A. 15 (6) : 38. 1921 ; Awasthi & Akhtar in Geophytology 8 (2) : 203. 1979. *Collema ulvaceum* Pers., Gaud. Voy. Uran. Bot. 203. 1826.

Thallus grows in orbicular or cushion shaped patches, lead grey ; lobes smooth to rough, without isidia. Apothecia common with many layered cortex at base, laminal, up to 2 mm diam., spores muriform, 25 - 36 × 10 - 12 µm.

*Habitat* : On tree trunks, scarce.

Miao forest, K.P. Singh 213.

*Distrib.* : INDIA : Tamilnadu ; SOUTH EAST ASIA.

### COCCOCARPIACEAE

**Coccocarpia erythroxyli** (Sprengel) Swinsc. & Krog. in Norw. J. Bot. 23 : 256. 1976 ; Awasthi in Kavaka 13 (2) : 83. 1985 (1987). *Lecidea erythroxyli* Sprengel, Vetensk., Acad. Nya Handl., 1 : 47. 1820.

Thallus lead grey, occurs in orbicular patches ; lobes ± imbricate, rotund at apices, 4 - 10 mm wide ; isidia and soredia absent ; lower surface with bluish black dense rhizines ; rhizines sometimes forming a dense hypothallus or projecting beyond lobe margins.

*Habitat* : Common on stones in moist places.

Burma nala, *K.P. Singh* 807.

*Distrib.* : INDIA : Assam, Karnataka, Kerala, Maharashtra, Manipur, Tamilnadu, West Bengal ; Cosmopolitan.

***Coccocarpia palmicola*** (Sprengel) Arvidsson & Galloway, Bot. Notiser, 132, 242. 1979 ; Awasthi in Kavaka 13 (2) : 84. 1985 (1987). *Lecidea palmicola* Sprengel in Vetensk. Acad. Nya Handl. 1 : 46. 1820.

Thallus lead grey, lobate ; lobes imbricate, apices rotund, 2 - 8 mm wide, upper surface with concentric rings, isidiate. Isidia cylindrical, flattened becoming squamuliform ; lower surface bluish black with dense mat of rhizines.

*Habitat* : Common on stones, ground and trees in moist places.

Deban, *K.P. Singh* 181 ; 25th mile, *K.P. Singh* 586 ; 36th mile, *K.P. Singh* 743.

*Distrib.* : INDIA : Assam, Karnataka, Kerala, Maharashtra, Manipur, Tamilnadu, Uttar Pradesh, Nagaland ; Tropical & Subtropical regions of the World.

## BACIDIACEAE

***Bacidia apiahica*** (Müell. Arg.) Zahlbr., Cat. Lich. Univ. 4 : 174. 1927 ; Awasthi & Mathur in Proc. Indian Acad. Sc. (Pl. Sci.) 97 (6) : 484. 1987. *Patellaria apiahica* Müell Arg., Lich. Epip. Novi : 9. 1890.

Thallus greenish grey, farinose. Apothecia pale orange, constricted below, 0.2 - 0.5 mm in diam. ; spores 3-septate, filiform, 20 - 30 × 2 µm.

*Habitat* : Foliicolous in moist places.

40th mile, *K.P. Singh* F 28.

*Distrib.* : INDIA : Tamilnadu ; Pantropical regions of the world.

***Bacidia glabinea*** (Kremph.) Zahlbr., Cat. Lich. Univ. 4 : 113. 1926 ; A. Singh in Prog. Pl. Res. 1 : 48. 1979. *Lecidea glabinea* Kremph. in Nuov. Giorn. Bot. Ital. 7 : 27. 1875.

Thallus verrucose, greenish grey. Apothecia yellow ; spores transversely 3 - septate, fusiform,  $10 - 12 \times 3 - 4 \mu\text{m}$ . Paraphyses simple.

*Habitat* : Follicolous in open moist places.

Miao, *K.P. Singh* F 14.

*Distrib.* : INDIA : Andaman Islands ; MALAYSIA.

*Bacidia palmularis* (Müell. Arg.) Zahlbr., *Cat. Lich. Univ.* 4 : 231. 1927. *Patellaria palmularis* Müell. Arg., *Lich. Epiphylli. Nov.* P. 10. 1890.

Apothecia reddish brown ; spores filiform, many septate,  $30 - 80 \times 4 \mu\text{m}$ .

*Habitat* : Follicolous in open places.

40th mile, *K.P. Singh* F 29 A.

*Distrib.* : INDIA : New record for India ; Pantropical but not common.

### ECTOLECHIACEAE

*Calopadia nymanii* (Sant.) Vězda in *Folia Geobot. Phytotax.* 21 : 215. 1986. *Lopadium nymanii* Sant. in *Symb. Bot. Upsal.* 12 (1) : 526. 1952 ; Sinha & Singh in *Geophytology* 17 (2) : 184. 1987.

Thallus greenish grey. Apothecia dark brown, ca 0.4 mm in diam. asci 8 spored ; spores muriform, colourless,  $90 - 110 \times 16 - 30 \mu\text{m}$  ; Paraphyses branched.

*Habitat* : Follicolous in moist places.

Miao, *K.P. Singh* F 7 B ; 40th mile, *K.P. Singh* F 71 B.

*Distrib.* : INDIA : Nagaland ; MALAYSIA.

*Calopadia puiggarii* (Müell. Arg.) Vězda in *Folia Geobot. Phytotax.* 21 : 215. 1986. *Heterothecium puiggarii* Müell. Arg. in *Flora.* 64 : 105. 1881. *Lopadium puiggarii* (Müell. Arg.) Zahlbr., *Cat. Lich. Univ.* 4 : 313. 1926 ; Sinha & Singh in *Geophytology* 17 (2) : 184. 1987.

Apothecia brown, epruinose, 0.2 - 0.5 mm in diam. ; hypothecium brown ; asci 1 spored ; spores muriform, colourless,  $54 - 70 \times 16 - 25 \mu\text{m}$ . Paraphyses branched.

*Habitat* : Follicolous in open moist places.

Miao, *K.P. Singh* F 36 ; 40th mile, *K.P. Singh* F 69 B & 78 A.

*Distrib.* : INDIA : Nagaland, Kerala, Tamilnadu ; Pantropical regions of World.

**Calopadia subcoerulescens** (Zahlbr.) Vězda in Lich. Sselecti Exsiccati, Inst. Bot. Acad. Sci. Chechoslovacae, Fasc. 88 (3) : 3, 1988. *Lopadium subcoerulescens* Zahlbr. in Zahlbr., Kesisster & Allan, Trans. New Zeal. Inst. 59 : 312 1928 ; Sinha & Singh in Geophytology 17 (2) : 184, 1987.

Apothecia black, ca 0.5 mm in diam., hypothecium aeruginous ; asci 1 spored ; spores colourless, muriform, 60 - 70 × 15 - 18 μm. Paraphyses branched.

*Habitat* : Foliicolous in open moist places.

Miao, K.P. Singh F 2.

*Distrib.* : INDIA : Andaman Islands, Nagaland, Tamilnadu ; ASIA, AUSTRALIA, NEWZEALAND.

**Sporopodium xantholeucum** (Müell. Arg.) Zahlbr., Cat. Lich. Univ. 2 : 681, 1924 ; Sinha & Singh in Geophytology 17 (2) : 183, 1987. *Gyalectidium xantholeucum* Müell. Arg. in Flora 64 : 101, 1881.

Thallus irregularly verrucose, pale grey. Apothecia dark brown, faintly pruinose ; epithecium with few algal cells above ; spores colourless, muriform, 50 - 75 × 15 - 18 μm. Paraphyses anastomosed.

*Habitat* : Foliicolous in open places.

Miao, K.P. Singh F 30, 48 C & F 41.

*Distrib.* : INDIA : Nagaland, Andaman Islands, Tamilnadu ; Pantropical regions of the world except Pacific Islands.

**Tapellaria bilimbioides** Sant. in Symb. Bot. Upsal. 12 (1) : 498, 1952 ; Sinha & Singh in Geophytology 17 (2) : 183, 1987.

Thallus greyish white. Apothecia constricted below, 0.2 - 0.3 mm in diam. ; hypothecium purplish brown ; spores transversely 3 - septate, 8 - 18 × 3 - 5 μm.

*Habitat* : Foliicolous in moist places.

40th mile, K.P. Singh 64 C, 69 C & 70 A.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; SUMATRA, PHILIPPINES.

## GOMPHILLACEAE

**Gyalectidium filicinum** Müell. Arg., Flora, 64 : 101. 1881 ;  
Sinha & Singh in Geophytology 17 (2) : 181. 1987.

Thallus greenish grey, verruculose. Apothecia adnate, brownish grey ; margin whitish ; disc concave ; epithecium with numerous algal cell above ; asci 1 spored ; spores muriform,  $30 - 40 \times 15 - 18 \mu\text{m}$ . Paraphyses anastomosed.

*Habitat* : Follicolous in open moist places.

40th mile, K.P. Singh F 72 A.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; Pantropical regions of the World.

**Tricharia albostrigosa** Sant. in Symb. Bot. Upsal. 12 (1) : 388. 1952 ;  
Sinha & Singh in Geophytology 17 (2) : 181. 1987.

Thallus smooth with numerous white tapering hairs. Apothecia brownish, urceolate, 0.2 - 0.5 mm in diam. ; spores muriform,  $35 - 45 \times 9 - 16 \mu\text{m}$ . Paraphyses anastomosed.

*Habitat* : Follicolous in moist places.

40th mile, K.P. Singh F 37 & 56 A.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; Tropical AMERICA.

**Tricharia vainioi** Sant. in Symb. Bot. Upsal. 12 (1) : 382. 1952 ;  
Sinha & Singh in Geophytology 17 (2) : 181. 1987.

Thallus with black hairs. Apothecia dark brown, ca 0.3 mm in diam. ; spores muriform,  $25 - 45 \times 12 - 15 \mu\text{m}$ . Paraphyses anastomosed.

*Habitat* : Follicolous in moist places.

40th mile, K.P. Singh F 77 B

*Distrib.* : INDIA : Nagaland ; Tropical AFRICA, AUSTRALIA, MALAYSIA.

## ASTEROTHYRIACEAE

**Echinoplaca pellicula** (Müell. Arg.) Sant. in Symb. Bot. Upsal. 12 (1) : 367. 1952 ;  
Singh in Geophytology 8 (1) : 129 - 130. 1978.  
*Arthonia pellicula* Müell. Arg. in Engler, Bot. Jahr. 4 : 56. 1883 b. Ind.  
f. *trichariosa* Müell Arg.

Thallus provided with white hairs. Apothecia pale brown, adnate on algiferous tissue, 0.3 - 1 mm in diam. ; excipulum laterally spreading over surface ; spores fusiform, transversely 3 - 6 septate, 12 - 20 × 6 - 7  $\mu$ m.

*Habitat* : Foliicolous in moist places.

Miao forest, K.P. Singh F 26

*Distrib.* : INDIA : Manipur ; Pantropical regions.

**Echinoplaca epiphylla** Fèe. Essai. Cryp. Ecorc. Officin. 93. 1824 ; Singh in Geophytology 8 (1) : 130. 1978.

Same to above species but spores muriform, 36 - 55 × 12 - 20  $\mu$ m.

*Habitat* : Foliicolous in moist places.

40th mile, K. P. Singh F 35 A.

*Distrib.* : INDIA : Manipur ; Pantropical regions of the World.

### PILOCARPACEAE

**Byssolecania fuscolivida** Vain. in Ann. Acad. Sci., Fenn. ser. A, 15 (6) : 167. 1921. *Byssolecania fumosonigricans* (Müell. Arg.) Sant. in Symb. Bot. Upsal. 12 (1) : 553. 1952 ; Sinha & Singh in Geophytology 17 (2) : 184. 1987.

Thallus greenish grey. Apothecia up to 1 mm in diam. ; adnate over an algal tissue ; exciple indistinct, spores colourless, fusiform, 3 septate, 8 - 18 × 3 - 5  $\mu$ m.

*Habitat* : Foliicolous in moist places.

40th mile, K. P. Singh F 42 & 64 A.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; BOLIVIA, BRAZIL, COSTARICA, NIGERIA, NEW GUINEA, PARAGUAY, PHILIPPINES, VENEZUELA.

**Byssoloma leucoblepharum** (Nyl.) Vain. in Dansk. Bot. Ark. 4 : 23. 1926 ; Sinha & Singh in Geophytology 17 (2) : 183. 1987. *Lecidea leucoblephara* Nyl. in Ann. Sci. Nat. Bot. ser. 4, 19 : 337., foot note. 1863.

Thallus greenish grey. Apothecia grey to brown, adnate, 0.2 - 0.4 mm in diam., margin white, byssoid ; exciple composed of loose hyphae spreading laterally ; spores transversely 3 - septate, oblong, 6 - 18 × 3 - 5  $\mu$ m.

*Habitat* : Follicolous in moist places.

40th mile, K. P. Singh F 64 B.

*Distrib.* : INDIA : Assam, Meghalaya, Nagaland, Tamilnadu ;  
Pantropical species, extending to temperate areas of the world.

*Byssoloma rotuliforme* (Muell. Arg.) Sant. apud Thord. J. Ecol.  
40 : 129. 1952 ; & Symb. Bot. Upsal. 12 (1) : 490. 1952. *Patellaria*  
*rotuliformis* Müell. Arg. Lich. Beitragl. 13 : 228. 1881 b.

Thallus in irregular patches ; apothecia sessile, constricted below ;  
disc black, excipulum white, K -.

*Habitat* : Follicolous in moist places.

Miao, K.P. Singh F 7 A, F 39

*Distrib.* ; INDIA : Tamilnadu ; Tropical, subtropical and partly  
in temperate regions of the World.

*Byssoloma tricholomum* (Mont) Zahlbr. em Sant. in Symb.  
Bnt. Upsal. 12 (1) : 480. 1952. *Blatora tricholoma* Mont. in Ann. Sci.  
Nat. Bot. ser. 3, 16 : 53. 1851.

Apothecia ± adnate, not constricted at base ; disc dark brown to  
brownish black, excipulum brown, K + yellow.

*Habitat* : Follicolous in shady and moist places.

40th mile, K.P. Singh 72 B.

*Distrib.* : INDIA : Arunachal Pradesh new record ; tropical  
AMERICA, MALAYSIA.

*Fellhanera fuscata* (Müell. Arg.) Vězda in Folia Geobot.  
Phytotax. 21 : 201. & 214. 1986 ; Awasthi & Mathur in Proc. Indian  
Acad. Sci. (Pl. Sci.) 97 (6) : 499. 1987. *Patellaria fuscata* Müell.  
Arg. in Flora, 64 : 231. 1881.

Thallus smooth. Apothecia brown, 0.1 - 0.2 mm in diam.,  
hypothecium brown ; spores bacillar, 5 - septate, 12 - 18 × 3 - 4 µm.

*Habitat* : Follicolous in moist shady places.

Miao, K.P. Singh 17 ; 40th mile, K.P. Singh 57 C.

*Distrib.* : INDIA : Nagaland, Tamilnadu ; Pantropical regions of  
the world.



**Fellhanera semicarpi** (Vain.) Vězda in Folia Geobot. Phytotax. 21 : 215. 1986 ; Awasthi & Mathur in Proc. Indian Acad. Sci. (Pl. Sci.) 97 (6) : 500. 1987. *Catillaria semicarpi* Vain. in Ann. Acad. Sci. Fenn. ser. A, 15 (6) : 110. 1921.

Thallus smooth. Apothecia flesh coloured with thin white margin ; spores colourless, transversely 1-septate,  $9-13 \times 3-4 \mu\text{m}$ .

*Habitat* : Follicolous in moist shady places.

Miao, *K.P. Singh* 13 ; 40th mile, *K.P. Singh* 78 B.

*Distrib.* : INDIA : Nagaland and Tamilnadu ; Pantropical regions of the World.

### PARMELIACEAE

**Bulbothrix isidiza** (Nyl.) Hale. in Phytologia, 28 : 480. 1974 ; Smithson. Contrib. Bot. 32 : 16. 1976. *Parmelia isidiza* Nyl. in Bull. Soc. Bot. 3 : 130. 1884 ; Awasthi in Biol. Mem. 1 : 178. 1976.

Thallus mineral grey to yellowish, 6-10 cm across ; lobes sublinear with cilia, laminally isidiate, lower surface brown ; rhizines simple ; atranorin and salacinic acid present.

*Habitat* : On stones as well as on trees in moist places.

Deban, *K.P. Singh* 179, 705 ; Burma nala, *K.P. Singh* 815.

*Distrib.* : INDIA : Manipur, Meghalaya, Nagaland, Uttar Pradesh, West Bengal ; Pantropical regions of the World.

**Bulbothrix setschwanensis** (Zahlbr.) Hale in Phytologia 28 : 481. 1974 ; Smithson. Contrib. Bot. 32 : 22. 1976. *Parmelia setschwanensis* Zahlbr. in Handel Mazzetti, Symb. Sin. 3 : 182. & 189. 1930 ; Awasthi in Biol. Mem. 1 : 192. 1976.

Thallus mineral grey to yellowish, 4-6 cm across ; lobes sublinear, imbricate ; margins dissected bulbate ciliate, without soredia or isidia ; lower surface brown throughout ; rhizines simple, brown ; atranorin and salacinic acid present.

*Habitat* : On stones as well as on trees in shady places.

Burma nala, *K.P. Singh* 818.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Nagaland, Uttar Pradesh, West Bengal ; CHINA, NEPAL.

**Everniastrum cirrhatum** (Fr.) Hale in Mycotaxon, 3 (3) : 347. 1976. *Parmelia cirrhata* Fr., Syst. Orb. Veget. 1 : 383. 1825 ; Awasthi in Biol. Mem. 1 : 168. 1976.

Thallus laciniate ; lobes linear elongate, ciliate, lower surface brown, rhizines absent ; atranorin and salacinic acid present.

*Habitat* : Common on tree branches.

Deban, *K.P. Singh* 704 A.

*Distrib.* : INDIA : Himachal Pradesh, West Bengal, Uttar Pradesh, Sikkim, Manipur, Nagaland ; Cosmopolitan.

**Everniastrum nepalense** (Tayl.) Hale in Mycotaxon, 3 (3) : 348. 1976. *Parmelia nepalensis* Tayl. in Lond. J. Bot. 6 : 172. 1847 ; Awasthi in Biol. Mem. 1 : 183. 1976.

Thallus laciniate ; lobes linear, ciliate ; lower surface black with dense rhizines ; atranorin and salacinic acid present.

*Habitat* : Common on trees in open places.

43rd mile, *K.P. Singh* 820 B.

*Distrib.* : INDIA : Arunachal Pradesh, West Bengal, Uttar Pradesh, Himachal Pradesh, Manipur, Nagaland, Tamilnadu ; Cosmopolitan.

**Hypotrachyna degelii** (Hale) Hale in Smith, Contrib. 25 : 31. 1975. *Parmelia degelii* Hale in Hale & Kurokawa, Contrib. U.S. Nat. Herb. 36 : 170. 1964.

Thallus mineral grey, coriaceous ; lobes short, sublinear, 3-5 mm wide, without isidia and soredia ; rhizines dichotomously branched ; atranorin and alectoronic acid present.

*Habitat* : On trees in shady places.

Deban, *K.P. Singh* 210.

*Distrib.* : INDIA : Tamilnadu ; AFRICA, BRAZIL, COLOMBIA, PERU.

**Hypotrachyna infirma** (Kurok.) Hale in Phytologia, 28 : 341. 1974. *Parmelia infirma* Kurok. in Hale and Kurokawa, Contrib. U.S. Nat. Herb. 36 : 179. 1964 ; Awasthi in Biol. Mem. 1 : 177. 1976.

Thallus shining, grey ; lobes sublinear, sinuate lobate, 1-3 mm wide, dentate, eciliate, emaculate, laminally isidiate ; isidia filiform ;

rhizines simple to dichotomously branched. Apothecia substipitate, few, 1 - 2 mm in diam. ; spores  $5 - 10 \times 4 - 9 \mu\text{m}$ , atranorin, protolichesterinic and caperatic acids present.

*Habitat* : On trees in evergreen forests.

Burma nala, *K.P. Singh* 800.

*Distrib.* : INDIA : Tamilnadu, West Bengal ; INDONESIA, FORMOSA, JAPAN, THAILAND.

***Parmelaria thomsonii*** (Stirt.) Awasthi in J. Hattori Bot. Lab. 63 : 368. 1987. *Platysma thomsonii* Stirt. in Proc. Phil. Soc. Glasgow 11 : 321. 1879. *Cetraria thomsonii* (Stirt.) Müell. Arg. in Flora. 74. 373. 1891. *Parmelia thomsonii* (Stirt.) Culb. in The Bryologist 65 : 306. 1962.

Thallus whitish grey, 5 - 8 cm across ; irregularly lobate, margins ciliate, irregularly dentate crenate to lacinulate ; upper surface without isidia or soredia ; lower surface black with simple rhizines ; densely pycnidiate. Pycnidia marginal present on lacinules, verruciform with wide ostiole ; pycnoconidia filiform, 2 - 3  $\mu\text{m}$  long ; atranorin, alectoronic and  $\alpha$  collatolic acid present.

*Habitat* : On tree trunks in open place.

Deban, *K.P. Singh* 215.

*Distrib.* : INDIA : Manipur, Nagaland, West Bengal, Sikkim, Uttar Pradesh ; NEPAL.

***Parmelina aurulenta*** (Tuck.) Hale in Phytologia 28 : 482. 1974. *Parmelia aurulenta* Tuck. in Amer. J. Arts. & Sci. ser. 2, 25 : 424. 1858. *Myelochroa aurulenta* (Tuck.) Elix & Hale in Mycotaxon 29 : 240. 1987.

Thallus yellowish grey to bluish grey, 3 - 8 cm across; lobes sublinear, apically subrotund, 2 - 5 mm wide ; margins ciliate, cilia short, present in axils only ; upper surface emaculate, pustulate sorediate. Soralia marginal ; medulla yellow ; lower surface black, densely rhizinate, rhizines black. Atranorin, zeorin and terpenes present.

*Habitat* : On stones in open places.

Miao forest, *K.P. Singh* 677 ; Deban area, *K.P. Singh* 701.

*Distrib.* : INDIA : Arunachal Pradesh, Himachal Pradesh, Nagaland, Uttar Pradesh, West Bengal ; Montane tropical and pantemperate regions of the World.

**Parmelina wallichiana** (Tayl.) Hale in *Phytologia* 28 : 483. 1974 ; *Smithson. Contrib. Bot.* 33 : 51. 1976. *Parmelia wallichiana* Tayl. in *Hook. Lond. J. Bot.* 6 : 176. 1847. *Parmelinella wallichiana* (Tayl.) Elix & Hale in *Mycotaxon* 29 : 242. 1987.

Thallus mineral grey to glaucous green, 6 - 10 cm across ; lobes subrotund to rotund, 3 - 10 mm wide ; minutely ciliate in the axils ; upper surface emaculate. Isidiate; isidia cylindrical ; lower surface black centrally and brownish towards periphery. Rhizines black, simple. Apothecia adnate, spores oval ellipsoid, 10 -14 × 6 - 12  $\mu$ m. Atranorin and salacinic acid present.

*Habitat* : On stones and trees in open shady places.

Miao forest, *K.P. Singh* 674.

*Distrib.* : INDIA : Assam, Manipur, Meghalaya, Nagaland, Sikkim, Uttar Pradesh, West Bengal, Tamilnadu ; Tropical & subtropical regions of the World.

**Parmotrema cristiferum** (Tayl.) Hale in *Phytologia* 23 : 333. 1974. *Parmelia cristifera* Tayl. in *Lond. J. Bot.* 6 : 165. 1847 ; Hale in *Contrib. U.S. Nat. Herb.* 36 : 24. 1965.

Thallus mineral grey, coriaceous ; lobes rotund, involute, eciliate, 8 - 10 mm wide, emaculate, marginally sorediate ; lower surface black ; naked and brown along the margins ; rhizines simple. Atranorin and salacinic acid present.

*Habitat* : Common on trees.

Miao forest, near Dihing river, *K.P. Singh* 672.

*Distrib.* : INDIA : Arunachal Pradesh, Bihar, Manipur, Nagaland, Orissa, West Bengal ; Pantropical regions of the World.

**Parmotrema reticulatum** (Tayl.) Choisy in *Bull. Mens. Soc. Linn. Lyon*, 21 : 175. 1952. *Parmelia reticulata* Tayl. in *Fl. Hibern.* 2 : 148. 1836 ; Awasthi in *Biol. Mem.* 1 : 217. 1976.

Thallus pale grey to mineral grey, soft to coriaceous, lobes rotund to subrotund, lacinate, very variable, ciliate ; reticulately cracked, maculate, marginally sorediate. Soralia linear to subcapitate ; lower surface black ; rhizines present or absent, simple to dichotomously branched. Atranorin and salacinic acid present.

*Habitat* : Corticolous, Saxicolous as well as Terricolous in moist places.

Deban forest, *K.P. Singh* 704.

*Distrib.* : INDIA : Assam, Himachal Pradesh, Madhya Pradesh, Manipur, Nagaland, Tamilnadu, Uttar Pradesh, West Bengal ; Pantropical parts of the World.

*Parmotrema sancti angelii* (Lynge) Hale in *Phytologia* 28 : 339, 1974. *Parmelia sancti angelii* Lynge in *Ark. f. Bot.* 13 (13) : 35, 1914 ; Awasthi in *Biol. Mem.* 1 : 220, 1976.

Thallus glaucous white to grey, coriaceous, lobes rotund, ciliate, 6–12 mm wide ; emaculate, sorediate. Soralia marginal, farinose ; lower surface black with a brown to white mottled marginal zone ; rhizines black, simple. Atranorin and gyrophoric acid present.

*Habitat* : a common lichen grows on stones, trees as well as on ground over mosses in open places.

43rd mile, *K.P. Singh* 320.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Tamilnadu, Uttar Pradesh, West Bengal ; Tropical regions of the World.

*Parmotrema tinctorum* (Despr. ex Nyl.) Hale in *Phytologia* 28 : 339, 1976. *Parmelia tinctorum* Despr. ex Nyl. in *Flora* 55 : 547, 1872 ; Krg & Swinscow in *Bull. Br. Mus. Nat. Hist. (Bot.)* 9(3) : 218, 1981.

Thallus whitish to glaucous grey, 8–20 cm across ; lobes rotund, eciliate, 5–10 mm wide ; upper surface smooth, emaculate, isidiate. Isidia laminal and cylindrical ; lower surface black with simple black rhizines. Atranorin and lecanoric acid present.

*Habitat* : Commonly grows on stones, trees and on ground over mosses in open places.

Deban, *K.P. Singh* 724.

*Distrib.* : INDIA : Assam, Bihar, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Sikkim, Tamilnadu, Uttar Pradesh, West Bengal ; Pantropical regions of the World.

#### USNEACEAE

*Usnea baileyi* (Stirt.) Zahlbr. in *Denschr. Akad. Wis. Wien. Math. Nat. Cl.* 83 : 182, 1909 ; G. Awasthi in *J. Hattori. Bot. Lab.* 61 : 346, 1986. *Eumitria baileyi* Stirt. *Scott. Nat.* 6 : 100, 1881.

Thallus fruticose, pendulous ; branches densely isidiate, papillate, pseudocyphellate. Medulla reddish ; axis hollow ; usnic, norcictic, salacinic acids and unidentified substance present.

*Habitat* : Common on road side trees.

36th mile, *K.P. Singh* 762.

*Distrib.* : INDIA : Arunachal Pradesh, Kerala, Manipur, Meghalaya, Nagaland, Sikkim, Tamilnadu, Uttar Pradesh, West Bengal ; SOUTH ASIA, AUSTRALIA, AFRICA, CENTRAL AMERICA.

*Usnea bismolliuscula* Zahlbr., Cat. Lich. Univ. 6 : 542. 1930 ; G. Awasthi in J. Hattori Bot. Lab. 61 : 366. 1986.

Thallus fruticose, decumbent to pendulous ; branches articulate, inflated, smooth to foveolate, isidiate ; papillate. Isidia filiform, leaving white scar on detachment. Usnic and stictic acid complex present.

*Habitat* : On tree trunks in open places.

Burma nala, *K.P. Singh* 312.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Tamilnadu, West Bengal ; JAPAN, NEW GUINEA.

*Usnea rubicunda* Stirt., Scott. Natur. 6 : 102. 1881 ; G. Awasthi in J. Hattori Bot. Lab. 61 : 382. 1986.

Thallus fruticose, bushy erect to procumbent, reddish brown ; branches terete, with dichotomously divided apices, pseudocyphellate, white to greenish. Usnic and stictic acid complex present.

*Habitat* : Common on tree trunks in open shady places.

36th mile, *K.P. Singh* 772, 780.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya, Tamilnadu, Uttar Pradesh, West Bengal ; NEPAL, AUSTRALIA, ENGLAND.

### RAMALINACEAE

*Ramalina subcomplanata* (Nyl.) Kashiwadani in Bull. Nat. Sci Mus. ser. B (Bot.) 12 (3) : 92. 1986. *Ramalina fraxinea* subsp. *subcomplanata* Nyl. in Bull. Soc. L. Normand. ser. 2, 4 : 134. 1870.

Thallus fruticose, suberect, greenish grey ; branching dichotomous to irregular ; surface longitudinally ridged, pseudocyphellate. Salacinic and usnic acids present.

*Habitat* : Common in open places on tree trunks.

Burma nata, *K.P. Singh* 812 B.

*Distrib.* : INDIA : Assam, Himachal Pradesh, Uttar Pradesh ;  
BHUTAN, CHINA, JAPAN, FORMOSA.

### CLADONIACEAE

**Cladonia bacillaris** (Ach.) Nyl. in Not. Sällsk. Fagn. Fl. Fenn. Forh. 8 : 179. 1866. *Baeomyces bacillaris* Ach., Meth. Lich. p. 329. 1803.

Primary squamules small, persistent ; podetia with interior of cups closed, axil also closed, 10 - 25 mm tall, ± terete, club shaped, cupless, esquamulose, cortex ± farinose sorediate, corticate at base. Apothecia reddish, embedded in tips of podetia, K ± red ; Barbatic and usnic acids present.

*Habitat* : On decaying wood.

Deban, *K.P. Singh* 681.

*Distrib.* : INDIA : Arunachal Pradesh, Himachal Pradesh ;  
cosmopolitan.

**Cladonia cartilaginea** Müell. Arg., Lich. Beiter. Fl. 63 : 260. 1880.

Podetia with interior of cups closed, axils also closed, cupless. Apothecia K - ; fumarprotocetraric acid present.

*Habitat* : On decaying wood.

Deban, *K.P. Singh* 173.

*Distrib.* : INDIA : Arunachal Pradesh, Jammu & Kashmir ;  
VENEZUELA.

**Cladonia coniocraea** (Florke) Sprengel, Syst. Veg. Linn. ed. 16, 4 : 272. 1827. *Cenomyce coniocraea* Florke, Deutsch. Lich. 7 : 11. 1821.

Primary squamules persistent, 1 - 4 mm long ; podetia 10 - 30 mm long, cylindrical, tapering apically, whitish to brownish, axils close, cups absent ; surface corticate, decorticate verrucose to farinose sorediate in apical region. Apothecia on podetial tips, brown to dark brown K - ; fumarprotocetraric acid present.

*Habitat* : On decaying wood and hard soil.

32nd mile, *K.P. Singh* 692.

*Distrib.* : INDIA : Arunachal Pradesh, Jammu & Kashmir, Nagaland, Uttar Pradesh ; AMERICA, AUSTRALIA.

*Cladonia pityrea* (Florke) Fries, Nov. Sched. Crit. : 21. 1826.  
*Capitularia pityrea* Florke, Berl. Magaz., 2 : 135. 1808.

Primary squamules persistent, 1 - 3 mm long ; podetia 8 - 45 mm long, whitish grey, simple to irregularly branched, axils close ; cups present or absent ; cups bearing podetia cylindrical with blunt ends, surface corticate, squamulose ; cupless podetia cylindrical with pointed ends ; surface decorticate, squamules absent, sorediate. Apothecia dark brown to blackish, K - ; fumarprotocetraric acid present.

*Habitat* : Common on hard soil along the road cuttings.

Deban, *K.P. Singh* 166 ; 40th mile, *K.P. Singh* 963.

*Distrib.* : INDIA : Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Manipur, Meghalaya, Nagaland, Sikkim, Tamilnadu, Uttar Pradesh, West Bengal ; Cosmopolitan.

*Cladonia scabriuscula* (Del.) Nyl. in Flora 58 : 447. 1875.  
*Cenomyce scabriuscula* Del. in Duby, Bot. Gall., ed. 2, 623. 1830.

Primary squamules disappearing, 2 - 4 mm long and broad ; podetia 15 - 25 mm long, yellowish grey, dichotomously to irregularly branched, tapering apically, axil open, cups absent ; surface corticate, squamulose, granular sorediate. Apothecia dark brown ; fumarprotocetraric,  $\pm$  ursolic acids present.

*Habitat* : Common on hard soil along the road cuttings.

Deban, *K.P. Singh* 207.

*Distrib.* : INDIA : Nagaland, Sikkim, Tamilnadu, Uttar Pradesh, West Bengal ; Cosmopolitan.

### PHYSCLACEAE

*Dirinaria confluens* (Fr.) Awasthi in Bib. Licn. 2 : 28. 1975.  
*Parmelia confluens* Fr., Syst. Orb. Veget. Part I. 284. 1825.

Thallus glaucous grey, closely adnate to substratum, lobes radiating centripetally, plicate, isidia and soredia absent. Apothecia aggregated in the centre ; spores brown 2 celled,  $18 - 30 \times 7 - 9 \mu\text{m}$  ; atranorin and divaricatic acid present.

*Habitat* : On trees in open places.



Miao forest, *K.P. Singh* 219.

*Distrib.* : INDIA : Maharashtra, Orissa, Nagaland, Tamilnadu ; Subtropical ASIA, AFRICA, AMERICA, AUSTRALIA.

***Dirinaria consimilis*** (Stirton) Awasthi, in Awasthi & Agarwal, J. Ind. Bot. Soc. 49 : 135. 1970 ; Awasthi, Bib. Lich. 2 : 91. 1975. *Physcia consimilis* Stirton in Proc. Phil. Soc. Glasgow. 11 : 310. 1879.

Thallus closely adpressed to the substratum, glaucous grey to whitish grey, lobes 0.5 - 1.5 mm wide, capitate sorediate. Soralia farinose; atranorin and sekikaic acid present.

*Habitat* : Common in open places on trees.

Deban area, *K.P. Singh* 682, 702, 708.

*Distrib.* : INDIA : Himachal Pradesh, Manipur, Nagaland, Tamilnadu, Uttar Pradesh, West Bengal ; Tropical AFRICA, ASIA.

***Dirinaria picta*** (Sw.) Clem. & Shear, Genera of Fungi. p. 323. 1931 ; Awasthi, Bib. Lich. 2 : 73. 1975. *Lichen pictus* Sw., Nova Gen. & Spec. Plant. 146. 1788.

Thallus occurs in suborbicular patches, closely adpressed, glaucous white ; lobes up to 1.5 mm wide, sorediate, soralia laminal, powdery.

*Habitat* : Common on tree trunks in open places.

Deban, *K.P. Singh* 707.

*Distrib.* : INDIA : Andaman Islands, Assam, Nagaland, Tamilnadu, Uttar Pradesh, West Bengal ; Pantropical regions of ASIA, AFRICA, AMERICA, AUSTRAL-ASIA and Pacific regions.

***Phaeophyscia endococcinodes*** (Poelt) Essl. in Mycotaxon, 7 (2) : 301. 1978. *Physcia endococcinodes* Poelt, Kumbhu Himal, 6 : 77. 1974.

Thallus grey to brownish ; lobes radiating, less than 1 mm wide, isidia and soredia absent ; medulla red, K + violet. Spores pachysporia type, 21 - 35 × 9 - 12 μm ; skyrin and zeorin present.

*Habitat* : Common on stones in moist places.

Burma nala, *K.P. Singh* 801.

*Distrib.* : INDIA : Manipur, Uttar Pradesh ; EAST AFRICA, NORTH AMERICA.

**Physcia tribacoides** Nyl. in Flora, 57 : 307, 1874 ; Singh in Biol. Mem. 6 (2) : 166, 1981.

Thallus whitish grey, lobes flat, smooth, capitate sorediate, atranorin, Zeorin and unidentified substance present.

*Habitat* : Epiphytic on trees, scarce.

Miao, K.P. Singh 219.

*Distrib.* : INDIA : Manipur, Nagaland, Tamilnadu ; Tropical regions of AFRICA, EUROPE, JAPAN, NORTH AMERICA.

**Pyxine congnata** Stirt. in Proc. Phil. Soc. Glasgow, 11 : 311, 1879 ; Awasthi in Phytomorph., 30 : 370, 1980.

Thallus glaucous grey to grey ; lobes up to 1 mm wide, maculate. Isidia and soredia absent ; cortex UV + yellow ; medulla yellow to rust coloured. Lichexanthone and unidentified substances at Rf class 5 and 6 present.

*Habitat* : Scarcely grows on trees.

Deban, K.P. Singh 710.

*Distrib.* : INDIA : Tamilnadu, Endemic.

**Pyxine philippina** Vain., Philipp. in J. Sci. Sect. C. 8 (2) : 110, 1913 ; Awasthi, Phytomorph. 30 : 376, 1980.

Thallus grey ; soredia, isidia, and pseudocyphellae absent ; cortex UV - ; medulla white to stramineose ; medullary hyphae moniliform. Atranorin, norstictic acid and terpenes present.

*Habitat* : On trees in open places.

Miao forest, K.P. Singh 182.

*Distrib.* : INDIA : Manipur, Nagaland, Uttar Pradesh, West Bengal ; JAPAN, PAPUA NEW GUINEA, PHILIPPINES.

**Pyxine sorediata** (Ach.) Mont. in Sagra in Hist. Cuba Bot. 9 : 188, 1842 ; Awasthi in Phytomorph. 30 : 378, 1980. *Lecidea sorediata* Ach. Syn. Meth. Lich. 54, 1814.

Thallus brownish grey to grey, lobes ascending, 4 - 5 cm across, laminally pseudocyphellate, pruinose, marginally sorediate ; cortex UV - ; medulla yellow. Terpenes present.

*Habitat* : Common on tree trunks in open shady places.

Burma nala, *K.P. Singh* 799.

*Distrib.* : INDIA : Manipur, Nagaland, Tamilnadu, Uttar Pradesh, West Bengal ; throughout tropical and subtropical regions of the World.

## HEPATICAЕ (BRYOPHYTA)

(*D.K. Singh*)

### LEPIDOZIACEAE

***Bazzania ovistipula*** (St.) Abeyw. in Ceylon J. Sci. (Bio. Sci.) 2 (1) : 45. 1959 ; Mizutani in J. Hattori Bot. Lab. 30 : 79. 1967 ; Kitagawa in J. Hattori Bot. Lab. 36 : 449. 1972 ; Udar, Bryol. India 10 : 1976. *Mastigobryum ovistipulum* St., Spec. Hep. 3 : 444. 1908.

Dioecious. Plants pale green, widely spreading, small, 1.2 - 1.6 mm wide, forming interwoven mats ; stems up to 20 mm long. Leaves oblong ovate, with three divergent, more or less apical teeth ; underleaves more or less entire, ovate, cells thinwalled, trigones small and bulging.

*Habitat* : Epiphytic on tree trunks and branches in evergreen forests.

Deban, *D.K. Singh*, 10213.

*Distrib.* : INDIA : Darjeeling, North-east India, Western Ghats ; NEPAL, SRI LANKA, VIETNAM, PHILIPPINES, JAPAN.

***Bazzania pearsonii*** (St.) Pears., Hep. Brit. Isles. 133. 1900 ; Macvicar, Stud. Handbk. British Hep. 319. 1926 ; Mizutani in J. Hattori Bot. Lab. 30 : 71 - 90. 1967 ; Udar, Bryol. India 10. 1976. *Mastigobryum pearsonii* St., Spec. Hep. 3 : 476. 1908.

Dioecious. Plants ochraceous or yellowish green, scattered or in tufts ; stems filiform, 25 - 75 mm long, simple or furcate, distally circinate. Leaves approximate imbricate, triangular ovate, patent, 2-3 dentate ; underleaves entire, oblong oval, apex retuse, rotund or truncate. Sporophyte on short postical branch, involucre bracts 2-3-dentate, margins crenulate denticulate.

*Habitat* : Lithophytic in shady places.

Deban, *D.K. Singh* 10219.

*Distrib.* : INDIA : Darjeeling, Sikkim, North - east India ; SRI LANKA, THAILAND, CHINA, JAPAN, ALASKA, U.K.

**Bazzania praerupta** (Reinw., Blume et Nees) Trev. in Mem. Inst. Lombardo Ser. 3, 4 : 414. 1877 ; Kitagawa in J. Hattori Bot. Lab. 36 : 450. 1972 ; Udar, Bryol. India 10. 1976. *Jungermannia praerupta* Reinw., Blume et Nees. in Nova Acta Leop. Carol. 12 : 229. 1824.

Plants green, forming tufts; stems 20 - 55 mm long. Leaves triangular ovate, 2 - 3-dentate, teeth large, divergent ; underleaves entire, oblong - obovate, apex retuse, cells with large, nodulose trigones.

*Habitat* : Epiphytic on tree trunks and twigs in undergrowths along streams in evergreen forests.

Lati valley, *D.K. Singh* 14329.

*Distrib.* : INDIA : Darjeeling, Sikkim, North-east India, Western Ghats ; NEPAL, SRI LANKA, MYANMAR, SUMATRA, BORNEO, PHILIPPINES, FARMOSA, JAPAN, NEW GUINEA.

**Bazzania tricrenata** (Wahl.) Trev. in Mem. Real. Inst. Lombardo, Ser. 3, 4 : 415. 1877 ; Kashyap, Liver. West. Himal. Panjab plains 2. 57. 1932 ; Udar, Bryol. India, 10. 1976. *Jungermannia tricrenata* Wahl., Fl. Carp. 364. 1914.

Plants in large, reddish brown or purplish tufts ; stems flagelliform, 30 - 70 mm long, procumbent. Leaves erectopatent, oblong or triangular ovate, 2 - 3 dentate, teeth irregular ; underleaves quadrate orbicular or squarrose, apex subentire, 3 - 4 lobulate, trigones more or less smooth.

*Habitat* : Lithophytic on soil covered moist rocks in shady places.

Deban 27th mile, *D.K. Singh* 10399

*Distrib.* : INDIA : Western Himalayas, Darjeeling, Sikkim, North-east India, Western Ghats ; NEPAL, CHINA, FARMOSA, JAPAN, NORTH AMERICA, EUROPE.

**Bazzania tridens** (Reinw., Blume et Nees) Trev. in Mem. Real. Inst. Lombardo, Ser. 3, 4 : 415. 1877 ; Udar, Bryol. India, 10. 1976 ; Kitagawa in Acta Phytotax. Geobot. 29 : 55. 1978. *Jungermannia tridens* Reinw., Blume et Nees in Acta Leop. Carol. 12 : 228. 1824.

Plants in tufts, green ; stems up to 35 mm long, flagelliform. Leaves ligulate ovate, 3 dentate ; underleaves rounded quadrate, entire, trigones small.

*Habitat.* : Epiphytic on tree trunks near base in evergreen forests.

Deban, *D.K. Singh* 10244.

*Distrib.* : INDIA : Darjeeling, Sikkim, North-east India, Western Ghats ; BHUTAN, NEPAL, SRI LANKA, MYANMAR, THAILAND, SUMATRA, BORNEO, CHINA, FARMOSA, JAPAN.

### CALYPOGELIACEAE

*Calypogelia fissa* (L.) Raddi. in Mem. Soc. Ital. Sci. Modena 18 : 44. 1818 ; Srivastava & Sharma in J. Indian bot. Soc. 66 : 287. 1987. *Mnium fissum* L., Sp. Pl. 1114. 1753, p.p.

Monoecious. Plants pale whitish green, sparingly branched ; stems 15 - 30 mm long, dorso - ventrally compressed. Leaves incubous, ovate, bidentate ; underleaves regular, 1/3 - 1/2 bilobed, rectangular. Androecial branches ventral intercalary ; female shoot ventral intercalary, with subterranean, rhizoidous marsupium.

*Habitat* : Terrestrial, on soil and leaf litter in moist shady places.

Deban, D.K. Singh 10323.

*Distrib.* : INDIA : Eastern Himalayas, North-east India ; EUROPE, NORTH AMERICA.

*Calypogelia trichomanis* (L.) Corda. in Opiz., Beitr. 653. 1829 ; Udar & Nath in Geophytol. 7 : 53. 1977. *Mnium trichomanis* L., Sp. Pl. 1114. 1753, p.p.

Paroicous-monoicous. Plants bluish green, sparingly branched ; stems 15 - 40 mm long, prostrate. Leaves incubous, broadly cordate ovate, entire ; underleaves regular, orbicular, 1/4 bilobed ; female shoot ventral intercalary, marsupium single or geminate.

*Habitat* : Terrestrial, on humus or decaying logs.

Deban, D.K. Singh 10234.

*Distrib.* : INDIA : North-east India, Western Ghats ; EUROPE, NORTH AMERICA.

### CEPHALOZIAACEAE

*Cephalozia gollani* St., Spec. Hep. V : 304. 1907 ; Kashyap, Liver. West. Himal. & Punjab plains 2 : 59. 1932 ; Udar & Kumar in Geophytology 6 : 36. 1976.

Plants yellowish or brownish green ; stems 5 - 12 mm long, sparsely branched, branches postical. Leaves succubous, suborbicular to quadrato-ovate, 1/4 - 1/3 bilobed, lobes convergent.

*Habitat.* : Terrestrial, on moist, soil covered rocks.

Deban, D.K. Singh 10311.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India. Endemic.

### JACKIELLACEAE

*Jackiella javanica* Schiffn. in Denkschr. Mat. Nat. Cl. Kais. Akad. Wiss. Wien. 70 : 217. 1900 ; Udar & A. Kumar in J. Indian bot. Soc. 60 : 105-111. 1981 ; Singh in J. Indian bot. Soc. 61 : 26. 1981.

Dioecious. Plants light green, prostrate-procumbent ; stems 10-25 mm long, branches ventral-intercalary. Leaves entire, broadly cordate ; underleaves reduced, bilobed, lobes uniseriate. Androecial branches ventral, spicate, bracts bilobed ; female shoot with subterranean marsupium.

var. *cavifolia* Schiffn. in Denkschr. Mat. Nat. Cl. Kais. Akad. Wiss. Wien 70 : 217. 1900 ; Udar & A. Kumar in Proc. Indian Acad. Sci. (Plant Sci.) 91 (2) : 132. 1982.

Plants prostrate. Leaves broader than long, antical margin decurrent. Lining capsule wall layer with incomplete thickening bands across the tangential walls.

*Habitat* : Terrestrial, on moist soil in shady places.

Deban, D.K. Singh 10309.

*Distrib.* : INDIA : Eastern Himalayas, North-east India ; JAVA, SUMATRA, JAPAN, TAHITI.

var. *cordifolia* Schiffn. in Denkschr. Mat. Nat. Cl. Kais. Akad. Wiss. Wien 70 : 217. 1900 ; Udar & A. Kumar in Proc. Indian Acad. Sci. (Plant Sci.) 91 (2) : 132. 1982.

Plants procumbent. Leaves longer than broad, antical margin nondecurrent. Lining capsule wall layer with complete thickening bands across the tangential walls.

*Habitat* : Terrestrial, on moist soil in shady places.

Deban, D.K. Singh 10304.

*Distrib.* : INDIA : North-east India, Western Ghats ; JAVA.

### JUNGERMANNIACEAE

*Chandonanthus hirtellus* (Web.) Mitt. in Hook. Handb. New Zealand Fl. 2 : 750. 1857 ; Udar & A. Kumar in Geophytology 12 : 63. 1982. *Jungermannia hirtella* Web. in Prodrum 50, No. 43. 1818.

Plants deep brown, forming large tufts ; stems 30 - 45 mm long, branches lateral intercalary. Leaves contiguous imbricate, 3-lobed, lobes triangular-ovate, laterally dentate ; underleaves bifid up to base, oblong ovate, margins recurved, dentate.

*Habitat* : Terrestrial, usually in pure populations, on moist rocks in shady places.

Deban, *D.K. Singh* 10279.

*Distrib.* : INDIA : Eastern Himalayas, North-east India ; SRI LANKA TAIWAN, JAPAN, AFRICA, AUSTRALIA.

**Jungermannia (Plectocolea) rubripunctata** (Hatt.) Amak., in J. Hattori Bot. Lab. 22 : 38. 1960 ; Udar & A. Kumar, in Misc. Bryol. Lichenol. 9 : 54. 1981. *Plectocolea rubripunctata* Hatt. in J. Hattori Bot. Lab. 3 : 41 1950.

Plants pale-deep purple, prostrate, flagelliferous ; stems 3 -12 mm long, apex ascending, gemmiparous. Leaves distant contiguous, ovate, apex obtuse ; rhizoides hyaline - purple ; gemmae 1-celled, borne on gemmiparous shoot or antical leaf margin.

*Habitat* : Terrestrial, in pure populations, on moist soil covered rocks.

27th mile, *D.K. Singh* 10419.

*Distrib.* : INDIA : Darjeeling, North-east India ; NEPAL, JAPAN.

**Jungermannia (Plectocolea) sikkimensis** St., Spec. Hep. 5. 1907.

Dioecious. Plants prostrate procumbent, frequently branched ; stems 5 - 12 mm long. Leaves succubous, entire, broadly ovate truncate. Androecia intercalary ; female inflorescence terminal, perianth 5 - 6 plicate, cells of outer capsule wall layer with nodulose thickenings, that of lining layer with transverse bands.

*Habitat* : Terrestrial, on moist soil in shady places.

Deban 27th mile, *D.K. Singh* 10397.

*Distrib.* : INDIA : Eastern Himalayas, North-east India, Western Ghats. Endemic.

**Jugermannia (Plectocolea) tetragona** Lindenb. in Meissn. Bot. Zeit. 6 : 462. 1848 ; Udar & A. Kumar in J. Indian bot. Soc. 62 : 357. 1983.

Dioecious. Plants prostrate ascending, light green ; stems 15 - 35 mm long. Leaves succubous, entire, ovate, with recurved antical margins ; rhizoids fasciculate, purple, often arising from abaxial leaf surface. Androecia terminal ; female inflorescence terminal, perianth 4-plicate, cells of lining capsule wall layer with incomplete thickening bands.

*Habitat* : Terrestrial, on moist soil in shade.

Deban, *D.K. Singh* 10391.

Distrib. : INDIA : Eastern Himalayas, North-east India, Madhya Pradesh, Maharashtra ; SRI LANKA, NEPAL, BORNEO, JAVA, SUMATRA, JAPAN, NEW CALEDONIA, NEW GUINEA, SAMOA, RYUKYU ISL.

*Notoscyphus darjeelingensis* Udar et Kumar in J. Hattori Bot. Lab. 49 : 250. 1981 ; Singh in J. Indian bot. Soc. 60 : 26. 1981.

Dioecious. Plants yellowish green, branches ventral intercalary ; stems 12 - 20 mm long. Leaves succubous, quadrate ovate, apex obtuse, trigones prominent, bulging ; underleaves 1/2 bifid, lobes unequal, acuminate, lateral tooth 0-1. Androecia intercalary or terminal, bracts in 5 - 9 pairs ; female inflorescence terminal, bracts and bracteoles 1-2 (-3)- paired, perigynium pendant, fleshy, rhizoidous, spores more or less bipolar.

*Habitat* : Terrestrial, on moist, calcareous soil in partially exposed places.

Deban, *D.K. Singh* 10333.

Distrib. : INDIA : Darjeeling, Meghalaya, Western Ghats. Endemic.

*Notoscyphus pandel* Udar et Kumar, J. Hattori Bot. Lab. 49 : 256. 1981 ; Singh in J. Indian bot. Soc. 60: 2. 1981.

Paroecious. Plants pale green, branches ventral intercalary ; stems 15 - 35 mm long. Leaves succubous, broadly ovate, entire or 2 - 3 fid, apex acute, trigones prominent, bulging ; underleaves 1/2 - 2/3 bifid, tooth 2. Androecia subterminal, below female inflorescence, bracts in 3 - 4 pairs ; female inflorescence terminal, bracts and bracteoles in 1 - 2 (-3) pairs ; spores apolar.

*Habitat* : Terrestrial on moist, calcareous soil in partially exposed places.

Deban, *D.K. Singh* 10297.



*Distrib.* : INDIA : Darjeeling, Sikkim, Meghalaya, Western Ghats. Endemic.

### GEOCALYCACEAE

*Lophocolea bidentata* (L.) Dum., Rec. D'obs., P. 17, 1835 ; Kashyap, Liver. Western Himal. & Panjab plains 2: 66, 1932 ; Udar & Nath in J. Indian bot. Soc. 55 : 81, 1976. *Jungermannia bidentata* L., Sp. Pl. 2, 1598, 1762.

Monoecious or dioecious. Plants whitish or pale green ; stems 12 - 35 mm long, procumbent, sparingly branched. Leaves patent divergent, oblong - quadrate or rhomboid,  $1/3 - 1/4$  bilobed, lobes lanceolate - acuminate ; underleaves patent,  $2/3 - 3/4$  bilobed, lobes subulate, with a tooth on either side. Androecia terminal or intercalary ; female inflorescence terminal ; perianth trigonous.

*Habitat* : Terrestrial, on moist soil on rocks along the streams.

Deban, D.K. Singh 10290

*Distrib.* : INDIA : Western Himalaya, North-east India, Western Ghats ; EUROPE, JAPAN.

*Chiloscyphus polyanthus* (L.) Corda, in Opiz, Beitr. I, 65, 1829 ; Pande *et al.*, in Proc. Nat. Inst. Sci. India 26 B : 140, 1960 ; Udar & Shaheen in J. Indian bot. Soc. 62 : 155, 1983. *Jungermannia polyanthos* L., Sp. Pl. ed 2, 1597, 1762.

Dioecious. Plants pale - brownish green ; stems 20 - 45 mm long, prostrate, ascending, sparingly branched. Leaves suborbicular-subquadrate, entire, apex rounded ; underleaves distant, oblong - ovate, lanceolate,  $1/2 - 2/3$  bilobed. Androecia intercalary or on lateral branches ; female inflorescence on short lateral shoots, perianth 3-lobed.

*Habitat* : Terrestrial, growing as brownish green patches on moist rocks near streams.

Deban, D.K. Singh 10401.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India, Western Ghats ; JAPAN, EUROPE.

### RADULACEAE

*Radula acuminata* St., Spec. Hep. 4: 230, 1910 ; Udar & Kumar in Geophytology 14 : 162, 1984.

Dioecious. Plants green, fragile ; stems 15 - 25 mm long, slender, irregularly pinnately branched. Leaves ovate, bilobed, lobule quadrate - elongate ; gemmae present. Androecia terminal or intercalary ; female inflorescence terminal or lateral, with 1 -2 subfloral innovations; perianth calvat ; cells of outer capsule wall layer with nodulose confluent nodulose thickenings.

*Habitat* : Epiphyllous, on the upper surface of leaves of *Phrynium* sp. and ferns in moist and dense forests.

27th mile, D.K. Singh 10476.

*Distrib.* : INDIA ; Arunachal Pradesh, Meghalaya, Western Ghats ; TONKIN.

*Radula assamica* St. in Hedwigia 23 : 151. 1884; Udar & Kumar in Geophytology 14 : 166. 1984.

Dioecious. Plants whitish - pale green, fragile ; stems slender, pinnately branched, 5 - 12 mm long. Leaves ovate, bilobed, lobule ligulate - subtriangulate ; gemmae present. Androecia terminal or intercalary ; female inflorescence terminal on main shoot, with 1 -2 subfloral innovations; perianth buccinate, terete; capsule oval ellipsoidal.

*Habitat* : Epiphyllous, on the upper surface of leaves of *Phrynium* sp. and ferns in moist and dense forests.

Deban, D.K. Singh 10475.

*Distrib.* : INDIA : Arunachal Pradesh ; JAPAN, VIETNAM.

#### PORELLACEAE

*Porella campylophylla* (Lehm. & Lindenb.) Trev. in Mem. Real. Inst. Lombardo Ser. 3, 4 : 408. 1877. *Madotheca campylophylla* Lehm. & Lindenb., Syn. Hep. 265, 1844 ; Kashyap, Liver. Western Himal. & Punjab plains 2 : 29. 1932.

Dioecious. Plants large, brownish - green, pinnately branched. Leaves oblong - ovate, bilobed, lobes entire, lobule ligulate, entire ; underleaves oblong - ovate or subquadrate, margins entire, apex truncate emarginate or pluridentate.

*Habitat* : Lithophytic, in moist and shady places.

Deban, D.K. Singh 10420.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India, Western Ghats ; NEPAL, BHUTAN, MYANMAR, INDO-CHINA.

**Porella densifolia** (St.) Hatt. in J. Jap. Bot. 20 : 109. 1944 ; Udar & Shaheen in J. Indian bot. Soc. 62 : 156. 1983. *Madotheca densifolia* St., Spec. Hep. 4: 294. 1910 ; Kashyap, Liver. Western Himal. & Panjab plains 2 : 41. 1932.

Plants robust, deep green ; stems 50 - 90 mm long, irregularly pinnate. Leaves oblong - bilobed, lobes with arcuate antical margin, lobules ovate - ligulae, apex rounded, base appendiculate ; underleaves ovate - triangulate, apex obtuse, wing inciso-lobate.

*Habitat* : Epiphytic, in moist places.

Deban, *D.K. Singh* 10419.

*Distrib.* : INDIA : Western Himalayas, North-east India ; NEPAL, CHINA, KOREA, JAPAN, FARMOSA.

subsp. **appendiculata** (St.) Hatt. in J. Hattori Bot. Lab. 32 : 343, 1969. *Madotheca appendiculata* St., Spec. Hep. 4: 301. 1910 ; Kashyap, Liver. Western Himal. & Panjab plains 2 : 28. 1932.

Plants large, flaccid, light-deep green ; stems up to 1.2 cm long, regularly bi-tetrapinnate. Lobule oblong - ovate, appendaged on both sides, appendages crisped ; underleaves ligulate, apex rounded, reflexed ; perianth campanulate.

*Habitat* : Lithophytic, on moist rocks near streams.

Deban, *D.K. Singh* 10329, 10330.

*Distrib.* : India : Western Himalayas, Arunachal Pradesh ; NEPAL.

**Porella plumosa** (Mitt.) Inoue in Bull. Nat. Sci. Mus. Tokyo 9 : 385. 1966 ; Udar, Bryol. India 16, 1976 ; Udar & Shaheen in Misc. Bryol. Lichenol. 9 : 196, 1983, *Madotheca plumosa* Mitt. in J. Proc. Linn. Soc. 5 : 108. 1860.

Dioecious. Plants light green ; stems 50 - 60 mm long, branches short, pinnate. Leaves ovate - oblong, margins entire, apex acuminate - pluridentate, bilobed, lobule small, subulate - ligulate ; underleaves quadrate - obovate or ovate, apex round - truncate or retuse. Female inflorescence terminal on short lateral branches, bracts and bracteoles dentate, perianth pyriform, 4 - 5 plicate.

*Habitat* : Epiphytic or terrestrial on moist rocks.

Deban, *D.K. Singh* 10256, 10279.

Distrib. : India : Western Himalayas, Meghalaya, Arunachal Pradesh ; INDO -CHINA, FARMOSA, PHILIPPINES.

### JUBULACEAE

**Frullania muscicola** St. in Hedwigia 33:146, 1894 ; Udar & Nath in J. Indian Bot. Soc. 55 : 83. 1976.

Dioecious. Plants brownish green ; stems 8 - 15 mm long, sparingly pinnate ; rhizoids dark brown. Leaves bilobed, lobes suborbicular, lobule galeate or ovate - oblong ; under leaves, suborbicular ovate, 1/4 bifid. Androecia terminal or intercalary, ovate ; perianth obovate, 4 - keeled.

*Habitat* : Epiphytic, growing closely adpressed to the bark.

27th mile, *D.K. Singh* 10432, 10433.

Distrib. : INDIA : Western Himalayas, Meghalaya, Arunachal Pradesh ; JAPAN, KOREA, CHINA.

**Frullania physantha** Mitt in Proc. Linn. Soc. 5 : 121. 1861 ; Nath & Udar in Proc. Indian Nat. Sci. Acad., B 50 : 229. 1984.

Dioecious. Plants olive green - reddish brown, robust ; stems 10 - 40 mm long, irregularly pinnate. Leaves bilobed, lobes ovate, lobule galeate, vertex rotundate ; underleaves orbicular - suborbicular, entire, apex truncate - retuse. Androecia terminal, globose ; perianth large, spherical, 5-keeled, beaked.

*Habitat* : Epiphytic, on the bark of trees in association with other foliaceous liverworts and mosses.

Deban, *D.K. Singh* 10235, 10310.

Distrib. : INDIA : Darjeeling, Meghalaya, Arunachal Pradesh ; NEPAL, BHUTAN, CHINA, VIETNAM.

**Frullania squarrosa** Nees, Syn. Hep., 416. 1844 ; Udar & Nath in New Bot. 2 : 74. 1979.

Dioecious. Plants green - deep brown ; stems 20 - 30 mm long, irregularly pinnate ; rhizoids rare. Leaves bilobed, lobes suborbicular - quadrate, antical base auricled, lobule galeate ; underleaves subrotund - ovate, apex bifid, margins entire - dentate. Androecia capitate ; perianth obovate - oblong, 3-keeled.

*Habitat* : Epiphytic as well as lithophytic in partially exposed places.

Deban, *D.K. Singh* 10263, 10348.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India, Western Ghats ; Throughout Pantropics.

### LEJEUNEACEAE

**Cololejeunea (Pedinolejeunea) farmosana** Mizut. in J. Hattori Bot. Lab. 24 : 250. 1961 ; Udar *et al.* in J. Indian bot. Soc. 66 : 22. 1987.

Monoecious. Plants pale green ; stems 3 -5 mm long. Leaves gemmiparous, bilobed, lobes orbicular, entire, lobule small, subulate, first tooth ciliate ; underleaves absent. Androecia terminal ; female inflorescence terminal with 1 subfloral innovation ; perianth obcordate, 2-plicate, apex truncate.

*Habitat* : Epiphyllous, inside deep forests.

Deban, *D.K. Singh* 10347.

*Distrib.* : INDIA : Arunachal Pradesh, Tamilnadu ; FARMOSA, JAPAN, RYUKYU ISLAND.

**Cololejeunea (Cololejeunea) pseudoplagiophylla** Wu et Lou in Acta Phytotax. Sin. 16 : 102. 112, 1978 ; Srivastava & Srivastava in Geophytology 19 : 129. 1989.

Monoecious. Plants pale green ; stems 3 - 5 mm long. Leaves gemmiparous, bilobed, lobes oblong broadly ovate, entire, apex rounded ; lobule inflated, bidentate ; underleaves absent. Androecia terminal or intercalary ; female inflorescence terminal, with 1 subfloral innovation ; perianth obovate, 3-plicate, apex beaked.

*Habitat* : Epiphyllous on *Phrynium* leaves in deep moist forests.

27th mile, *D.K. Singh* 10477.

*Distrib.* : INDIA : Arunachal Pradesh ; TIBET.

**Cololejeunea (Cololejeunea) spinosa** (Horik.) Hatt. in Bull. Tokyo Sci. Mus. 11 : 102. 1944 ; Srivastava & Srivastava in Geophytology 19 : 124. 1989. *Physocolea spinosa* Horik. in J. Sci. Hiroshima Univ. ser. b, div. 2, 70. 1931.

Plants whitish pale green ; stems 2 - 5 mm long, irregularly pinnate. Leaves bilobed, lobes ovate falcate, margins crenate, lobule inflated, bidentate.

*Habitat* : Epiphyllous, inside deep forests.

Deban, *D.K. Singh* 10465.

*Distrib.* : INDIA : Darjeeling, Arunachal Pradesh ; JAPAN, RYUKYU ISLAND.

***Colura calyptrifolia*** (Hook.) Dum., Rec. d'obs 12. 1835 ; Lal in Curr. Sci. 46 : 618. 1977. *Jungermannia calyptrifolia* Hook., Brit. Jung. 43. 1813.

Monoecious. Plants minute, pale green ; stems 2 - 4 mm long, filiform, rarely branched, prostrate. Leaves bilobed, lobes ovoid, narrowed into long, straight or curved beak ; lobule strongly involute, saccate ; underleaves distant, bifid, lobes subulate. Androecia globose ; female inflorescence terminal, perianth exserted, oblong - campanulate, 5-keeled, apex truncate.

*Habitat* : Epiphyllous, in moist places.

Deban 27th mile, *D.K. Singh* 10402.

*Distrib.* : INDIA : Darjeeling, Arunachal Pradesh ; EUROPE, AFRICA.

***Leptolejeunea foliicola*** St. in Hedwigia 35 : 106. 1896 ; Udar & Awasthi in J. Indian bot. Soc. 61 : 299. 1982.

Dioecious. Plants pale green ; stems 5 - 8 mm long. Leaves bilobed, lobes ovate, margins denticulate, apex apiculate, lobule narrow, rectangulate, bidentate ; underleaves bilobed, lobes divaricate, biseriate towards base, lamina rectangulate. Female inflorescence terminal on lateral branches, perianth tubular.

*Habitat* : Epiphyllous, in moist areas along streams.

27th mile, *D.K. Singh* 10407.

*Distrib.* : INDIA : Meghalaya, Arunachal Pradesh ; JAVA, SUMATRA, MALAYA, PHILIPPINES, JAPAN, CHINA, FARMOSA, RYUKYU ISLAND.

***Leptolejeunea subacuta*** St., Spec. Hep. 5 : 379. 1913 ; Awasthi in J. Indian bot. Soc. 65 : 122. 1986.

Dioecious. Plants brownish green ; stems 4 - 10 mm long, prostrate, female branches suberect. Leaves bilobed, lobes elliptical or elliptico - obovate, margins entire, apex acute - apiculate, lobule narrow elongated rhomboid, bidentate ; underleaves bilobed, lobes straight, uniseriate, lamina triangulate. Androecia terminal ; female inflorescence terminal ; perianth obconical obovate, 5-keeled.

*Habitat* : Epiphyllous, in moist places in association with *L. foliicola*.

27th mile, *D.K. Singh* 10406.

*Distrib.* : INDIA : North-east India, Western Ghats ; JAVA, SUMATRA, BORNEO, PHILIPPINES, FARMOSA, JAPAN, RYUKYU ISLAND.

***Mastigolejeunea repleta*** (Tayl.) St., Spec. Hep. 4 : 772. 1912 ; Awasthi & Udar in Proc. Ind. Acad. Sci. (Pl. Sci.) 93 : 491. 1984. *Lejeunea repleta* Tayl. in *Linn. J. Bot.* 5: 392. 1846.

Monoecious. Plants robust ; stems 12 - 40 mm long, irregularly branched. Leaves squarrose, bilobed, lobes oblong, falcate, margin entire, apex more or less apiculate, lobule rectangulate lanceolate, 1 -2 dentate ; underleaves obcordate, entire, apex retuse truncate. Androecia lateral or as subfloral innovation ; female inflorescence terminal, with 1 -2 subfloral innovation, perianth oblong, 3-plicate, rostrate.

*Habitat* : Epiphytic on the bark of *Quercus* sp. in exposed places.

Lati valley, *D.K. Singh* 14419.

*Distrib.* : INDIA : North-east India, Western Ghats, Andaman Islands ; BHUTAN, MYANMAR, PHILIPPINES, HONGKONG.

***Ptychanthus striatus*** (Lehm. et Lindenb.) Nees in *Naturg. Eur. Leberm.* 3 : 212. 1938 ; Awasthi & Srivastava in *Geophytology* 17 : 12. 1987. *Jungermannia striatus* Lehm. et Lindenb. in *Lehm. Pugillus* 4 : 16. 1832.

Monoecious. Plants brownish green ; stems 35 - 50 mm long, pinnately branched. Leaves bilobed, lobes oblong ovate, margins dentate, apex acute, lobule ovate, 1 -2 (-3) dentate ; underleaves suborbicular quadrate, margin dentate, apex truncate rounded. Androecia terminal or intercalary ; female inflorescence terminal, with subfloral innovations ; perianth oblong - obovate, pluriplicate, rostrate.

*Habitat* : Epiphytic on the bark of trees and undergrowths.

Lati valley, *D.K. Singh* 14376.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India, Western Ghats, Andaman Islands ; AMBONIA, MYANMAR, MALAYA, FARMOSA, JAPAN, RYUKYU ISLAND AFRICA.

**Rhaphidolejeunea yunnanensis** Chen in Feddes Rep. 58 : 45. 1955 ; Udar & Awasthi in Yushania 1 : 15. 1984.

Dioecious. Plants whitish pale green ; stems 4 - 10 mm long, irregularly branched with lateral brood branches. Leaves bilobed, lobes oblong or ovate, margins crenate, apex acute, lobule rectangulate-ovate, 1-dentate ; underleaves bilobed, lobes divaricate, uniseriate biseriate, lamina ellipsoidal. Female inflorescence on lateral branches.

*Habitat* : Epiphyllous, grows in association with *Leptolejeunea foliicola* and *L. subacuta*.

27th mile, D.K. Singh 10409.

*Distrib.* : INDIA : Darjeeling, Arunachal Pradesh, Western Ghats ; CHINA, VIETNAM.

**Spruceanthus semirepandus** (Nees) Verd. in Ann. Bryol. (Suppl.) 4 : 153. 1934 ; Udar & Awasthi in J. Indian bot. Soc. 61 : 184. 1982. *Jungermannia semirepanda* Nees, Hep. Jav. 39. 1830.

Monoecious. Plants greenish brown, robust ; stems 20 - 55 mm, branched. Leaves bilobed, lobes asymmetrically ovate, margins crenulate, lobule ovate rectangulate, 1-2 dentate ; underleaves quadrate obovate, apex rounded - truncate, dentate. Androecia terminal, with 1-2 subfloral innovations, perianth oblong - obovate, pluriplicate, rostrate.

*Habitat* : Epithytic, in partially exposed regions.

27th mile, D.K. Singh 10413.

*Distrib.* : INDIA : Eastern Himalayas, North-east India, Western Ghats, SRI LANKA, NEPAL, JAPAN.

### FOSSOBRONIACEAE

**Fossombronia cristula** Aust., Acad. Philad. 228, 1866 ; Srivastava & Udar in Nova Hedwig. 26 : 808. 1975.

Monoecious. Plants green ; stems 6 - 12 mm long, dichotomously branched, branches prostrate ascending. Leaves quadrate, irregularly lobed. Androecia monandrous, scattered on the dorsal stem surface. Pseudoperianth campanulate; cells of capsule wall lining layer with semiannular thickenings ; spores lamellate.

*Habitat* : Terrestrial, on moist soil in partially exposed places.

Miao, D.K. Singh 10225.



*Distrib.* : INDIA : Meghalaya, Arunachal Pradesh, Western Ghats ; JAPAN, EUROPE, NORTH AMERICA.

**Fossombronia wondraczekii** (Corda) Dum., Rec. d'obs. 11. 1835 ; Srivastava & Udar in Nova Hedwg. 26 : 812. 1975. *Jungermannia wondraczekii* Corda in Sturm. Deutschl. Fl. Fasc. 2 : 30. 1830.

Monoecious. Plants pale green ; stems 4 -12 mm long, dichotomously branched. Leaves suborbicular, margins undulate, irregularly lobed. Androecia monandrous, scattered on the dorsal stem surface near apex. Pseudoperianth campanulate; cells of capsule wall lining layer with nodulose thickenings on radial walls ; spores lamellate - reticulate.

*Habitat* : Terrestrial, on moist and exposed rocks.

Miao, D.K. Singh 10257.

*Distrib.* : INDIA : Arunachal Pradesh, Western Ghats ; EUROPE.

#### PELLIACEAE

**Pellia epiphylla** (L.) Corda in Opiz. Beitr. 645. 1129 ; Udar *et al.* in Geophytology 8 : 35. 1978. *Jungermannia epiphylla* L., Sp. Pl. 1135, 1753.

Paroicous. Plants light - dark green, with red tinge; thallus 10 - 25 mm long, up to 10 mm broad, apex obovate - cuneate. Involucre semicylindrical, scale like; perianth cylindrical - clavate, papillose ; cells of outer capsule wall layer with nodulose thickening, that of lining layer with semiannular thickening.

*Habitat* : Terrestrial, on moist banks, ditches and rock crevices.

Deban, D.K. Singh 10360.

*Distrib.* : INDIA : Throughout Himalayas, North-east India ; JAPAN, EUROPE.

#### PALLAVICINIACEAE

**Pallavicinia lyellii** (Hook.) Gray in Nat. Arr. Brit. Pl. 1 : 775. 1821 ; Udar *et al.*, in Geophytology 8 : 35. 1978. *Jugermannia lyellii* Hook., Brit. Jung. 77. 1816.

Dioecious. Plants pale green ; thallus 25 - 45 mm long, up to 5 mm broad, rarely dichotomously branched, wings unistratose. Male

plants smaller ; androecia in single row along the midrib. Involucres dorsal, unequally laciniate ; pseudoperianth buccinate; capsule wall 1-stratose, cells with nodulose thickening.

*Habitat* : Terrestrial, usually hydroscopic along the stream banks or rock crevices.

Deban, *D.K. Singh* 10357.

*Distrib.* : INDIA : Throughout India ; JAPAN, EUROPE, NORTH AMERICA, NEWZEALAND.

### ANEURACEAE

*Aneura pellioides* (Horik.) Inoue in J. Hattori Bot. Lab. 25 : 209. 1962 ; Srivastava & Udar in Biol. Mem. 1 : 147. 1976. *Riccardia pellioides* Horik. in Bot. Mag. Tokyo 51 : 429. 1937.

Dioecious. Plants light green ; thalli linear, 10 - 40 mm long, 5 - 8 mm broad, margins entire-undulate. Male plants 2-3 times branched, androecia on lateral shoots. Gynoecia dorsal or lateral; pseudoperianth clavate - cylindrical, blackish brown; cells of capsule wall with nodulose radial wall thickenings.

*Habitat* : Terrestrial, on moist soil layer over rocks.

Deban, *D.K. Singh* 10387.

*Distrib.* : INDIA : Eastern Himalayas, North-east India, Western Ghats ; JAPAN.

*Riccardia multifida* (L.) Gray in Nat. Arr. Brit. Pl. 1 : 684. 1821 ; Srivastava & Udar in Biol. Mem. 1 : 137. 1976. *Jungermannia multifida* L., Sp. Pl. 1 ed. 1136, 1753.

Monoecious. Plants pale green - green ; thalli 10 - 30 mm long, up to 1 mm broad, irregularly pinnate, margins entire or crenulate. Androecial branches slender, lanceolate. Gynoecia abbreviated; pseudoperianth massive, clavate, papillate - appendiculate; capsule wall bistratose, cells of outer layer with semiannular thickening bands, those of lining layer with bulging nodulose thickening.

*Habitat* : Terrestrial, in moist and shady places.

27th mile, *D.K. Singh* 10493.

*Distrib.* : INDIA : Eastern Himalayas, North-east India, Western Ghats ; SRI LANKA, JAPAN, EUROPE, NORTH AMERICA.

**Riccardia sikkimensis** (St.) Pande & Srivastava in J. Indian bot. Soc. 37 : 417. 1958 ; Srivastava & Udar in Biol. Mem. 1 : 135. 1976. *Aneura sikkimensis* St., Spec. Hep. 6 : 42. 1917.

Dioecious. Plants green - deep brown ; thalli 12 - 30 mm long, up to 1.5 mm broad, pinnate, margins entire. Androecial branches lateral, opposite or solitary. Gynoecia abbreviated; pseudoperianth clavate - cylindrical, fleshy, papillate; capsule wall bistratose, cells of outer layer with semiannular thickening bands, those of lining layer with bulging - nodulose thickenings.

*Habitat* : Terrestrial, on moist rocks near streams.

27th mile, D.K. Singh 10453.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India. Endemic.

**Riccardia tenuicostata** Schiffn. in Denkschr. Math. Nat. Cl. Kais. Akad. Wiss. Wien. 67 : 166. 1898 ; Srivastava & Udar in Biol. Mem. 1 : 128. 1976.

Monoecious. Plants yellowish - reddish brown ; thalli 5 - 7 mm long, up to 0.6 mm broad, pinnate, margins entire. Androecial branches narrow - lanceolate. Gynoecial branches short, margins papillose, apex lacinate; pseudoperianth clavate - cylindrical, asperate.

*Habitat* : Epiphytic or terrestrial, on moist and shady rock.

Deban, D.K. Singh 10435, 10467.

*Distrib.* : INDIA : Western Himalayas, North-east India, Western Ghats ; SINGAPORE, JAVA.

**Riccardia villosa** (St.) Pande et Srivastava in J. Indian bot. Soc. 37 : 417. 1958 ; Srivastava & Udar, Biol. Mem. 1 : 129. 1976. *Aneura villosa* St., Spec. Hep. 4: 45. 1917.

Dioecious. Plants yellow - light brown ; thalli 6 - 12 mm long, up to 0.1 mm broad, linear - lanceolate, margins crenulate. Gynoecial branches abbreviated, margins papillose; pseudoperianth clavate, fleshy, papillate.

*Habitat* : Epiphytic, in moist and shady areas.

27th mile, D.K. Singh 10479.

*Distrib.* : INDIA : Eastern Himalayas, Arunachal Pradesh. Endemic.

### TARGIONIACEAE

*Targionia hypophylla* L., Sp. Pl. 1153 ; *Udar*, Bryol. India, 53. 1976.

Monoecious. Plants whitish - olive green ; thalli 10 - 20 mm long, 2 - 5 broad, with ventral innovations, margin entire, areole simple, air chambers with green assimilatory filaments ; ventral scales triangulate, unappendaged. Antheridiophore discoid on ventral shoots. Involucre naviculate, keeled, purplish black; capsule wall 1-stratose, cells with nodulose and annular spiral thickenings ; spores reticulate.

*Habitat* : Terrestrial, in exposed places.

Lati valley, *D.K. Singh* 14359.

*Distrib.* : INDIA : Throughout India ; EUROPE.

### CONOCEPHALACEAE

*Conocephalum conicum* (L.) Dum., Comm. Bot. 115, 1822 ; Pande & Bharad. in J. Indian bot. Soc. 29 : 2. 1949. *Marchantia conica* L., Sp. Pl. 1138, 1753.

Dioecious. Plants dark green, shining ; thalli 10 -25 mm long, 8 -15 mm broad, flat, margins undulate ; areole semi-barrel shaped, very conspicuous ; ventral scales in single row on either side of mid-rib, appendage purple, orbicular reniform. Antheridiophore sessile. Archegoniophore terminal, stalked; capsule wall 1- stratose, cells with annular thickenings.

*Habitat* : Terrestrial, in moist and cool places.

Lati valley ; *D.K. Singh* 14447.

*Distrib.* : INDIA : Throughout Himalayas ; JAPAN, CHINA, AFRICA, EUROPE, AMERICA.

### REBOULIACEAE

*Plagiochasma appendiculatum* Lehm. et Lindenb., Lehm. Pugillus 4 : 14. 1832 ; *Udar*, Bryol. India, 42. 1976.

Monoecious. Plants light - dark green ; thalli 10 - 40 mm long, 4 - 2 mm broad, dichotomously branched, adventitious shoots present, areole simple, inconspicuous; ventral scales in single row on either side

of mid-rib, purple, broadly lunate, with 1-2, ovate-lanceolate appendage. Antheridiophore hippocrepicus. Archegoniophores dorsal, sessile stalked, receptacle 5-6 (-9)-lobed; capsule wall 1-stratose; spores lamellate - reticulate.

*Habitat* : Terrestrial, on moist soil covered rocks.

27th mile, D.K. Singh 10340.

*Distrib.* : INDIA : Throughout Himalayas, Western Ghats. Endemic.

**Reboulia hemisphaerica** (L.) Readdi, Opusc. Sci. Bologna II, 357. 1818; Udar, Bryol. India, 40. 1976. *Marchantia hemisphaerica* L., Sp. Pl. 1138. 1753.

Dioecious or monoecious. Plants caespitose, dark green; thalli 15-30 mm long, 4-10 mm broad, margins ascending, crenulate; aerole slightly elevated, conspicuous; ventral scales purple, in single row on each side of mid-rib, obliquely lunate, with 2-4, linear appendages. Antheridiophores sessile, discoid. Archegoniophores terminal, stalked, receptacles 4-7-lobed; capsule wall 1-stratose; cells hyaline; spores lamellate - reticulate.

*Habitat* : Terrestrial, on soil over rocks in comparatively dry places.

Miao Deban, D.K. Singh 10259.

*Distrib.* : INDIA : Throughout India; Cosmopolitan.

### MARCHANTIACEAE

**Dumortiera hirsuta** (Sw.) Reinw., Blume et Nees in Nova Acta Leop. Carol. 7: 410. 1825; Udar, Bryol. in India, 39. 1976. *Marchantia hirsuta* Sw., Prodr. Fl. Ind. Occ., 145. 1795.

Dioecious or monoecious. Plants dark green; thalli 40-100 mm long, 8-15 mm broad, dichotomously branched, margins undulate; assimilatory zone absent; ventral scales evanescent, in older portions only. Antheridiophores terminal, sessile, hirsute. Archegoniophores terminal, stalked, receptacles, 5-7 lobed; capsule wall cells with annular thickenings; spores muricate.

*Habitat* : Terrestrial, hygrosopic, near streams or under constantly dripping water.

Deban, *D.K. Singh* 10270.

*Distrib.* : INDIA : Throughout India ; SOUTH EAST ASIA, JAPAN, EUROPE, SOUTH AFRICA.

**Marchantia nepalensis** Lehm. et Lindenb. in Lehm. Pugillus 4 : 10. 1832 ; Udar, Bryol. India, 39. 1976.

Dioecious. Plants caespitose, dark green ; thalli 15 - 30 mm long, 5 - 12 mm broad, profusely dichotomous, margins entire, crisped ; midrib not distinct ; gemma cups present ; aereole cupiform, conspicuous ; ventral scales in 2 rows on either side of midrib, semilunar, with ovate-lanceolate ; appendages. Antheridiophore terminal, stalked ; receptacle inconspicuously 6 - 8 lobed. Archegoniophores terminal, stalked ; receptacle umbonate, 7 - 9 lobed.

Terrestrial, on moist soil over rocks along the stream banks.

Miao Deban, *D.K. Singh* 10251.

*Distrib.* : INDIA : Western Himalayas, Eastern Himalayas, North-east India ; NEPAL.

**Marchantia palmata** Nees in Nov. Act. 12: 193. 1824 ; Udar, Bryol. India, 38. 1976.

Dioecious. Plants light green ; thalli 30 - 70 mm long, 2 - 10 mm broad, dichotomous ; midrib distinct ; gemma cup present ; aereole cupiform, conspicuous ; ventral scales in 2 rows on either side of midrib, semilunar, median scales with rotundate - ovate appendage, laminar scales without appendage. Antheridiophore stalked ; receptacle palmatifid. Archegoniophore stalked, terminal ; receptacle palmatifid, 7 - 11 - lobed.

*Habitat* : Terrestrial, on moist soil, over rocks along the stream banks.

Miao Deban, *D.K. Singh* 10289.

*Distrib.* : INDIA : Western Himalayas, North east India, Western Ghats ; SOUTH EAST ASIA.

### RICCIACEAE

**Ricciocarpus natans** (L.) Corda in Opiz. Beitr. 651, 1829 ; Udar, Bryol. India, 57. 1976. *Riccia natans* L., Syst. Veget. 956. 1781.

Dioecious, dimorphic ; thalli 8 - 12 mm long, 5 - 8 mm broad, 2 - 3 times dichotomously branched, lobes obcordate with distinct median furrow ; air - chambers multilayered, devoid of assimilatory filaments ; aereole simple ; ventral scales abundant, large, pendant, purple, serrated ; terrestrial forms red tinged, with reduced scales.

*Habitat* : Aquatic, floating or terrestrial hygrosopic in moist places.

Miao, *D.K. Singh* 10248.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Meghalaya, Manipur, Arunachal Pradesh ; PAKISTAN, EUROPE, NORTH AMERICA, SOUTH AFRICA.

### ANTHOCEROTACEAE

**Folloceros appendiculatus** (St.) Udar *et* Singh in *J. Econ. Taxon. Bot.* 8 : 224. 1986. *Anthoceros appendiculatus* St. in *Engl. Bot. Jahrb.* 23 : 315. 1896.

Monoecious, protandrous. Plants light green, caespitose ; thalli 6 - 12 mm long, 3 - 7 mm broad, cavernose, schizogenous cavities multilayered, dorsal surface beset with appendiculate, tuberculoid spongy bodies ; chloroplasts with indistinct pyrenoid. Androecia scattered on dorsal surface, with 14 - 30, clavate antheridia, antheridial jacket cells arranged in 4 tiers. Involucres solitary ; capsule wall 5 - 7 stratose, stomatiferous ; spores light brown, baculate, apolar ; elaters 2 - 4 celled, uniformly thickened.

*Habitat* : Terrestrial, in moist and exposed soil.

Deban 27th mile, *D.K. Singh* 10415.

*Distrib.* : INDIA : Sikkim, Assam, Arunachal Pradesh ; JAVA, SUMATRA, SAMOA, NEW GUINEA.

**Phaeoceros laevis** (L.) Prosk. in *Bull. Torrey Bot. Club* 78 : 347. 1951. *Anthoceros laevis* L., *Sp. Pl.* 1139. 1753 ; Udar, *Bryol. India*, 59. 1976.

Thalli 10 - 20 mm long, 2 - 7 mm broad, noncavernose, margins entire undulate ; dorsal surface smooth ; tuberiferous. Androecia scattered, with 2 - 4, globose antheridia, antheridial jacket cells irregularly arranged ; involucres solitary. Spores yellow, polar, with distinct triradiate mark and equatorial crassitudo

subsp. *laevis* Prosk. in Rapp. et Comm. VIII Congr. Intern. Bot. Paris 14 - 16 : 69. 1954 ; Asthana & Srivastava in Bryophyt. Bib. 42 : 122. 1991.

Diocious. Plants light green - pale green ; involucre short, distally expanded. Spores 30 - 40  $\mu$ m diam.

*Habitat* : Terrestrial, on moist, and loose soil.

27th mile, D.K. Singh 10483 ; Deban, D.K. Singh 10365.

*Distrib.* : INDIA : Himalayas, North - east India ; cosmopolitan

subsp. *carolinianus* (Michaux) Prosk. in Rapp. et Comm. VIII Congr. Intern. Bot. Paris 14 - 16 : 69, 1954 ; Hasegawa, J. Hattori Bot. Lab. 57 : 244. 1984 ; Asthana & Srivastava in Bryophyt. Bib. 42 : 125. 1991. *Anthoceros carolinianus* Michaux, Flora bor - America 2 : 280. 1803.

Monoecious. Plants dark green ; involucre large, ovate-triangular, distally narrow. Spores yellow, 35 - 56  $\mu$ m in diam.

*Habitat* : Terrestrial, on moist and loose soil.

27th mile, D.K. Singh 10483.

*Distrib.* : INDIA : Himalayas, Meghalaya, Arunachal Pradesh ; cosmopolitan

## PTERIDOPHYTES

### HUPERZIACEAE

*Huperzia squarrosa* (Forst.) Trev. in Atti. Soc. Ital. Sci. Nat. 17 : 247. 1875. *Lycopodium squarrosus* Forst., Prodr. 86. 1786.

Pendant herbs ; growing on mossy bark of trees. Leaves narrowly lanceolate-linear. Sporangia only towards their extremities, axillary on long pendulous strobilus ca 15 cm long.

Ganga Jheel, 87730 ; Imbeong, 87621.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Assam, Nagaland, Meghalaya, Kerala ; NEPAL, BANGLA DESH, MYANMAR, SRI LANKA, MALAYSIA, PHILIPPINES.

*Huperzia subulifolia* (Wallich ex Hook. & Grev.) Trev. in Atti. Soc. Ital. Sci. Nat. 17 : 248. 1875. *Lycopodium subulifolium* Wallich ex Hook. & Grev. Icon. Fil. 1. 49. 1831.



Stems dichotomously branched ; on moss covered tree trunks. Leaves narrow linear, green, lax ; midrib not distinct. Sporangia solitary, axillary.

Jairampur, 14846.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, SRI LANKA.

**Phlegmariurus phlegmaria** (L.) Sen & Sen in Fern Gaz. 11 (6) : 421. f. 4 a - j. 1978. *Lycopodium phlegmarium* L., Sp. Pl. 2:1101. 1753.

Pendulous epiphytic herbs, dichotomously branched, light green. Cones slender, green, branched.

Imbeong, 87614 ; Glao village, 48541.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Assam, Nagaland, Kerala, Andaman & Nicobar Islands ; Tropics of the World.

#### LYCOPODIACEAE

**Palhinhaea cernua** (L.) Franco. & Vasc. in Vasc. & Franco., Bot. Soc. Broter. Ser. 2. 41 : 25. 1967. *Lycopodium cernuum* L., Sp. Pl. 2 : 1103. 1753.

Herbs with rigid stems ; amongst bamboos and grasses on rocky ground. Primary branches divaricate, bright green. Cones small, fertile.

Nampong forest, 88701 ; M' Pen check gate, 83130;

Deban, 83648 ; Nampong to Pangsung Pass, 20029.

*Distrib.* : INDIA : Throughout India ; Tropics of both hemispheres.

#### SELAGINELLACEAE

**Selaginella decipiens** Warb, Monsonia 1 : 127. 1900 ; Panigr. & Dixit in J. Indian bot. Soc. 46 (2-3) : 225. 1967.

Terrestrial herbs ; stems pinnately branched above. Leaves dimorphic, membranous. Sporangia yellowish-green.

Sonegobam 10360 ; 27th mile M.V. road 86654 ; 17th mile M.V. road 43743.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Mizoram, Meghalaya ; MALAYA, CHINA.

***Selaginella helferi*** Warb, *Monsunia* 1 : 107. 1900 ; Panigr. & Dixit in J. Indian bot. Soc. 46 (2-3) : 226-227. 1967.

Terrestrial herbs, stems irregularly branched. Leaves dimorphic. Mega and microsporangia in same strobilus.

Namong Pangs Pass, 22044 ; Namchik, 20179.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya, Andaman & Nicobar Islands ; MYANMAR, CHINA, INDO-CHINA.

***Selaginella hookeri*** Baker in J. Bot. 23 : 21. 1886 ; Panigr. & Dixit in J. Indian bot. Soc. 46 (2-3) : 227. 1967.

Terrestrial herbs ; stems decumbent, pinnately branched ; lateral branches bipinnate. Leaves dimorphic. Mega and microsporangia in the same strobilus.

Deban forest, 88616.

*Distrib.* : INDIA : North east India ; MYANMAR, CHINA, MALAYA.

***Selaginella semicordata*** (Wallich ex Hook. & Grev.) Spring, Mart. Fl. Bras. 1(2) : 122. 1840 ; Baishya & Rao, Ferns & Fern allies Meghalaya 28. 1982. *Lycopodium semicordatum* Wallich ex Hook. & Grev. in Hook., Bot. Misc. 2 : 396. 1831.

Terrestrial herbs ; stems erect, weak. Leaves contiguous, dimorphic. Mega and microsporangia in the same strobilus.

29th mile M.V. road, 86624 ; Pangs Pass forests, 20043 ;

Zero camp, 84921 ; 40th mile M.V. road, 87680.

*Distrib.* : INDIA : Bihar, Sikkim, Arunachal Pradesh, Assam, Tripura ; MYANMAR, BANGLA DESH, MALAYA.

***Selaginella wallichii*** (Hook. & Grev.) Spring, Mart. Fl. Bras. 1 (2) : 124. 1840 ; Panigr. & Dixit in Proc. Nat. Inst. Sci. India 34 B (4) : 204-205. *Lycopodium wallichii* Hook. & Grev. in Hook, Bot. Misc. 2 : 284. 1831.

Trailing or procumbent herbs ; branches pinnate, lateral ones bipinnate. Leaves dimorphic, distant. Sporophylls uniform.

Jairampur, 26756, 73087.

*Distrib.* : INDIA : North-East India ; MYANMAR, MALAYA, LAOS. TONKIN.

**EQUISETACEAE**

**Equisetum diffusum** D. Don, Prodr. Fl. Nep. 19. 1825 ; Baishya & Rao, Ferns & Fern allies Meghalaya 29. 1982.

Small tufted herbs ; stem erect. Fertile and sterile branches alike, diffused. Strobilus stalked ; spores reddish brown.

Deban forest, 88685.

*Distrib.* : INDIA : Shimla to Arunachal Pradesh, Assam, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Equisetum ramosissimum** Desf., Fl. Atlant. 2: 398. 1800. subsp. **debile** (Roxb. ex Vouch.) Hauke, Amer. Fern. J. 52 : 33. 1962: Dixit, Cens. Indian Pteri. 20. 1984. *E. debile* Roxb. ex Vouch, Mon. Preles 387. 1821.

Terrestrial herbs ; sterile and fertile branches alike, simple or irregularly branched. Strobilus terminal, apiculate. Sporangia oblong, yellowish.

M'Pen check gate, 81020 ; Deban forest, 85123.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, MYANMAR, CHINA, PHILIPPINES, NEW GUINEA, FIJI.

**PSILOTACEAE**

**Psilotum nudum** (L.) P. Beauv., Prodr. Fam. Aetheog. 112. 1805 ; Raizada, Indian For. 61: 754. 1939. *Lycopodium nudum* L., Sp. Pl. 2 : 1100. 1753.

Erect or sub erect herbs, branches triquetrous, many times dichotomously branched. Sporangia trilobed on short sporangiophore.

34th mile, M. V. road, 87642 ; Nampong to Pangsung Pass, 20146.

*Distrib.* : INDIA : Throughout hilly regions in India ; MYANMAR, MALAYSIA.

**ANGIOPTERIDACEAE**

**Angiopteris evecta** (Forst.) Hoffm., Comm. Soc. Reg. Gott. 12 : 29. t. 5. 1794 ; Beddome, Handb. Ferns Brit. India 460. t. 285. 1883 ; Dixit, Cens. Indian Pteri. 25. 1984. *Polypodium evectum* Forst, Prodr. 81. 1786.

Terrestrial herbs ; rhizome erect, broad, Stipe very long, bulbous at base. Fronds very long, bipinnate. Sori dark brown, arranged in two close rows.

Miao nala, 77517 ; 26th mile M.V. road, 86681, 88705.

*Distrib.* : INDIA : Throughout hilly regions in India ; CHINA, JAPAN, MADAGASKAR, MALAYSIA, AUSTRALIA.

### POLYPODIACEAE

**Arthromeris wallichiana** (Sprengel) Ching in Contr. Inst. Bot. Natn. Acad. Peiping 2:92. 1933 ; Dixit, Cens. Indian Pteri. 35. 1984. *Polypodium wallichianum* Sprengel, Syst. Veg. 4 : 53. 1827.

Terrestrial or epiphytic ferns. Rhizome creeping, densely covered with reddish brown scales. Sori globose, in a solitary row between lateral veins.

22nd mile, M.V. road, 87844.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BHUTAN, MYANMAR, CHINA, THAILAND.

**Belvisia mucronata** (Fée) Copel., Gen. Fil. 192. 1947 ; Dixit, Cens. Indian Pteri. 36. 1984.

Epiphytic fern ; rhizome erect. Sori brown at the tip of the fronds.

22nd mile, M.V. road, 87862.

*Distrib.* : INDIA : Arunachal Pradesh ; SRI LANKA.

**Colysis hemionitidea** (Wallich ex Mett.) Presl, Epim. Bot. 147. 1851 ; Jamir & Rao, Ferns Nagaland 128. 1987. *Polypodium hemionitideum* Wallich ex Mett., Ann. Lugd. Bat. 4(2) : 215. 1866.

Rhizome, wide creeping, densely clothed with brown ramenta. Fronds simple, winged nearly throughout the stipe. Sori oblong elongate, borne in one row between the lateral veins.

Near Glao village, 48550.

*Distrib.* : INDIA : Throughout India ; NEPAL, VIETNAM, CHINA, PHILIPPINES, MALAYA.

**Drymoglossum heterophyllum** (L.) Trimen in J. Linn. Soc. 24: 152. 1887. *Acrostichum heterophyllum* L., Sp. Pl. 2 : 1067. 1753.

Rhizome wiry, compactly scaly. Fronds glabrous, fleshy, membranous. Sori small, superficial. Sporangia light brown.

Wakro to Nara, 10739 A.

*Distrib.* : INDIA : Throughout hilly regions in India ; SRI LANKA, CHINA, JAPAN, JAVA, PHILIPPINES.

**Goniophlebium amoenum** (Wallich ex Mett.) J. Smith in Hook. Gen. Fil. t. 51. 1940 ; Dixit, Cens. Indian Pteri. 38. 1984. *Polypodium amoenum* Wallich ex Mett., Abh. Senckneb. naturf. Ges. 2 : 80. 1857.

Epiphytes ; rhizome fleshy, creeping ; scales adpressed, grey brown. Fronds simple, deeply pinnatifid, rachis dark pubescent above, glabrous beneath. Sori large, round terminal.

36th mile, M.V. road, 87629.

*Distrib.* : INDIA : Garwal to Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN, CHINA, FORMOSA, THAILAND.

**Kaulinia hancockii** (Baker) Nayer in Taxon 13 : 67. 1964 ; Baishya & Rao, Ferns & Fern allies Meghalaya 62. 1982. *Polypodium hancockii* Baker in J. Bot. 116. 1889. *Microsorium dilatatum* (Beddome) Sledge in Bull. Brit. Mus. (Nat. Hist.) Bot. 2 : 143. 1960. *Polypodium dilatatum* Wallich ex Hook., Sp. Fil. 5 : 85. 1863. *Pleopeltis dilatata* Beddome Ferns Brit. India 367. 1883. *Microsorium hancockii* (Baker) Ching, Bull. Fan. Mem. Inst. 4 : 309. 1933.

Rhizome short, creeping, densely covered with dark brown scales. Sori copious, globose, oval, often more or less elongate or confluent, dorsal on veinlets, irregularly scattered throughout the lamina.

Jairampur forest, 14774.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; SRI LANKA, CHINA, MALAYA.

**Kaulinia pteropus** (Blume) Nayer in Taxon 13 : 67. 1964 ; Baishya & Rao, Ferns & Fern allies Meghalaya 62. 1982. *Polypodium pteropus* Blume, Pl. Jav. 168. 76. 1828. *Microsorium pteropus* (Blume) Ching, Bull. Fan. Mem. Inst. 4 : 312. 1933.

Rhizome creeping, fleshy, green, apical part densely covered with dull brown scales. Sori small, globose, often forming coenosori along the veins, scattered irregularly within the main areoles.

1st mile, M.V. road, 78132 ; Wanu, 16702.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland, Meghalaya ; NEPAL, BHUTAN, BANGLA DESH, MALAYA PEN-INSULA, MALAYSIA, FORMOSA.

**Lemmaphyllum carnosum** (Wallich) Presl., Epim. Bot. 158. 1840. *Nothlaena carnosa* Wallich, Cat. 138. 1828. *Drymoglossum carnosum* (Wallich) J. Smith in Hook. Gen. Fil. t. 784. 1841.

Rhizome slender, creeping, densely covered with scales. Fronds dimorphic, small. Sori linear, intermediate between the costa and margin, almost all the under surface except at margins.

27th mile M.V. road, 87884 ; South bank of Noa Diting river, 85135 ; On the way to Imbeong, 87604.

*Distrib.* : INDIA : Kumaon to North east India ; NEPAL, BHUTAN, CHINA, JAPAN, MALAYA.

*Lepidogrammitis rostrata* (Hook.) Ching in Acta Phytotax. Sin. 9 : 372. 1964. *Polypodium rostratum* Hook., Icon. Pl. t. 953. 1854. *Lepidogrammitis subrostrata* (C. Chr.) Ching, Sunyat. 5 : 258. 1940 ; Dixit, Cens. Indian Pteri. 39. 1984.

Epiphytic fern. Rhizome widely creeping, densely covered with brown scales. Sori large glabrous, round in a single row on either side to the midrib.

Deban 27th mile, M.V. road, 73281.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN, MYANMAR, CHINA, THAILAND.

*Lepisorus thunbergianus* (Kaulf.) Ching, Bull. Fan. Mem. Inst. Biol. Bot. 4 : 88. 1933 ; Jamir & Rao, Ferns Nagaland 86. 1987. *Pleopeltis thunbergiana* Kaulf., Wesen. Farnkr. 113. 1827.

Epiphytic fern. Rhizome wide creeping, covered with dark brown scales. Sori round to oval, close spaced, medial, in a single row on either side of the costa.

Kamlat to Walap, 88001.

*Distrib.* : INDIA : Western Himalaya, Arunachal Pradesh, Nagaland ; CHINA, KOREA, INDO CHINA, FORMOSA AND PHILIPPINES.

*Leptochilus axillaris* (Cav.) Kaulf., Enum. Fil. 147. t. 1. f. 10. 1824 ; Baishya & Rao, Ferns & Fern allies Meghalaya 66. 1982. *Acrostichum axillare* Cav., Anal. Nat. 1 : 101. 1799.

Epiphytic fern. Fronds dimorphic, slender, fertile fronds linear. Sporangia oval, dark brown.

Wakro, 14961.

*Distrib.* : INDIA : West Bengal, Arunachal Pradesh, Assam, Nagaland, Meghalaya, South India ; MYANMAR, BANGLA DESH.

**Microsorium cuspidatum** (D. Don) Tagawa in Hara, Fl. E. Himalaya 495. 1966 ; Dixit, Cens. Indian Pteri. 44. 1984. *Polypodium cuspidatum* D. Don, Prodr. Fl. Nep. 2. 1825. *P. lucidum* Roxb. ex Griffith, Calc. J. Nat. Sci. 4 : 486. 1844. *P. leiorrhizum* Wallich ex Mett., Fil Lips. 37. t. 25. f. 7. 1856. *Pleopeltis leiorrhiza* (Wallich ex Mett.) Moore, Ind. Fil. 346. 1862.

Short epiphytic stout fern with creeping rhizome. Fronds large ; stipe wiry, brown.

Khaf village, 48140 ; Way to Wakro, 48602 ; 42 mile M.V. road, 74333.

*Distrib.* : INDIA : North & North east India, CHINA, LAOS, TONKIN.

**Microsorium punctatum** (L.) Copel, Univ. California Publ. Bot. 16 : 111. 1929 ; Holttum, Fl. Malaya 2 : 179. 1968. *Acrostichum punctatum*. L., Sp. Pl. ed. II. 2 : 1524. 1763. *Polypodium punctatum* Sw. in Schrad. J. 1800. 2 : 21. 1801. *Pleopeltis punctatum* (L.) Beddome in Handb. Ferns Brit. India 357. t. 201. 1883.

Epiphytes or lithophytes (on moss covered rocks) ; rhizome creeping, sparsely covered with thick blackish scales. Fertile fronds with sori irregularly scattered on the apical part of the lamina.

Miao Deban, 79071.

*Distrib.* : INDIA : North India, Sikkim, Arunachal Pradesh, Nagaland, Meghalaya, Western Ghats ; CHINA, SRI LANKA, VIETNAM, MALAYA, AFRICA, AUSTRALIA.

**Microsorium superficiale** (Blume) Ching in Bull. Fan. Mem. Inst. Biol. 4 : 299. 1933 ; Jamir & Rao, Ferns Nagaland 115. 1987. *Polypodium superficiale* Blume, Jav. Fil. 130. t. 56. f. a. 1828. *Pleopeltis superficial* (Blume) Beddome, Handb. Ferns Brit. India 350. 1883.

Rhizomes scandent, densely covered with thin brownish scales. Fronds linear lanceolate, often sinuate. Sori irregularly scattered throughout the surface of lamina, round to oval, yellowish brown.

Wanu, 15044.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN, CHINA, MALAYA.

**Microsorium zippelii** (Blume) Ching, Bull. Fan. Mem. Inst. Biol. 4 : 308. 1933 ; Dixit, Cens. Indian Pteri. 47. 1984. *Polypodium zippelii* Blume, Enum. Fl. Jav. 172. t. 80. 1828. *Pleopeltis heterocarpa*

Beddome, Ferns Brit. India t. 319. 1869. *P. zippelli* Moore, Ind. Fil. CCCVIII. 1862.

Epiphytic ferns ; rhizome slender, creeping. Fronds simple, erect. Sori scattered, dark brown.

Giao lake, 48587 ; Deban Bulbulia, 78162.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, BHUTAN, CHINA, JAVA, PHILIPPINES, MALAYSIA.

*Neochetropteris normalis* (D. Don) Tagawa in J. Jap. Bot. 27 : 217. 1952 ; Baishya & Rao, Ferns & Fern allies Meghalaya 68. 1982. *Polypodium normale* D. Don, Prodr. Fl. Nep. 1. 1825. *Pleopeltis normalis* (D. Don) Moore, Ind. Fil. CCCXLVII. 1862. *Microsorium normale* (D. Don) Ching in Bull. Fan. Mem. Inst. Biol. Bot. 4 : 299. 1933.

Epiphytic fern : rhizome flattened, covered with small, ovate lanceolate scales with red brown hairs. Sori globose, in one irregular row on either side of the midrib, superficial or little immersed.

27th mile, M.V. road, 87874.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Pyrrosia adnascens* (Sw.) Ching in Bull. Chin. Bot. Soc. 1 : 45. 1935 ; Holttum, Fl. Malaya 2 : 144. Pl. 60. 1968. *Polypodium adnascens* Sw., Syn. Fil. 25. 222. t. 2. f. 2. 1806. *Niphobolus adnascens* (Sw.) Kaulf., Enum. Fil. 124. 1824.

Epiphytic fern ; rhizome long creeping, more or less densely covered with brown to pale brown, ovate - lanceolate scales. Sori small, round, dark brown, depressed, sunk in the tomentum, covering from costa to margin.

17th mile, M.V. road, 78140 ; M.V. road, 85162.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya ; CHINA, FORMOSA, MALAYSIA, POLYNESIA.

*Pyrrosia beddomeana* (Gies.) Ching in Bull. Chin. Bot. Soc. 1 : 68. 1935 ; Baishya & Rao, Ferns & Fern allies Meghalaya 74. 1982. *Niphobolus beddomeanus* Gies, Farngatt. Niph. 101. 1901. *N. costatus* Beddome, Ferns Brit. India t. 120. 1865. *Polypodium stigosum* C.B. Clarke, Trans. Linn. Soc. Lond. II. Bot. 1 : 553. 1880. *Niphobolus stigosum* Beddome, Handb. Ferns Brit. India 328. 1883, p.p.



Rhizome short, creeping, covered by much fibrous roots. Fronds oblanceolate, acuminate at apex. Sori globose, in close rows towards the apex of the lamina.

Near Glao village, 47888.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; CHINA.

***Pyrrosia flocculosa*** (D. Don) Ching in Bull. Chin. Bot. Soc. 1: 66. 1935 ; Baishya & Rao, Ferns & Fern allies Meghalaya 75. 1982. *Polypodium flocculosum* D. Don, Prodr. Fl. Nep. 1 : 1825. *Niphobolus flocculosus* (D. Don) Beddome. Ferns Brit. India t. 162. 1867.

Epiphytic or lithophytic fern ; rhizome short creeping, densely covered with linear, brown, hair tipped scales. Sori copious, globose, depressed, arranged in regular rows between the costules.

Glao lake, 14756.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA.

***Pyrrosia heteracta*** (Mett. ex Kuhn) Ching in Bull. Chin. Bot. Soc. 1 : 57. 1935 ; Dixit, Cens. Indian Pteri. 54. 1984. *Polypodium heteractis* Mett. ex Kuhn in Linnaea 36 : 140. 1869. *Nephobolus heteractus* (Mett. ex Kuhn) J. Smith, Ferns Brit. & For. ed. 2. 296. 1877. *N. lingua sensu* Beddome, Ferns Brit. India Suppl. 22. t. 385. 1876.

Epiphytic or lithophytic fern ; rhizome wide creeping, wiry, branched, densely covered with palebrown scales. Sori rather large, globose, prominent, depressed, usually scattered throughout the lamina.

Ganga Jheel, 87721 ; 22nd mile, M.V. road, 87854 ; Krosam to Shirong, 88067.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MYANMAR, CHINA.

***Pyrrosia lanceolata*** (L.) Farw., Amer. Midl. Nat. 12 : 245. 1931 ; Dixit, Cens. Indian Pteri. 54. 1984. *Acrostichum lanceolatum* L., Sp. Pl. 2 : 1067. 1753. *Polypodium adnascens auct.* Hook. & Baker, Syn. Fil. 349. 1867. *Niphobolus adnascens* Beddome, Handb. Ferns Brit. India 325. t. 176. 1883 *non* Kaulf. 1824.

Epiphytic on moss clad tree trunks. Sori brick red, all over the lower surface of the fertile pinnae.

Happy valley, 83779 ; Deban forest, 88657.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, BHUTAN, SRI LANKA, POLYNESIA, CHINA.

***Pyrrrosia lingua*** (Thunb.) Farw., Amer. Midl. Nat. 12 : 302. 1931 ; Jamir & Rao, Ferns Nagaland 96. 1987. *Acrostichum linguam* Thunb., Fl. Jap. 330. t. 33. 1784. *Niphobolus heteractis sensu* Beddome, Handb. Ferns Brit. India 327. 1883. p.p.

Fern with creeping rhizomes, densely covered with adpressed, dark to pale - brown scales. Sori round, goldenbrown, shining, covering either whole or upper half of lamina from costa to margin.

Namchik, 20214 ; Krosam, 88028 ; Krosam to Shirong, 88060.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland ; CHINA, JAPAN, FORMOSA, TONKIN.

***Pyrrrosia mannii*** (Gies.) Ching in Bull. Chin. Bot. Soc. 1 : 55. 1935 ; Baishya & Rao, Ferns & Fern allies Meghalaya 75. 1982. *Niphobolus mannii* Gies., Farngef. Niph 107. 1901. *N. fissus* Hook., Sp. Fil. 5 : 48. 1867. *N. floccigerus* Beddome, Ferns Brit. India Suppl. 22. t. 386. 1876.

Epiphytic fern ; rhizome short creeping, more or less densely covered with ferruginous brown scales. Sori copious, small, round, dark to reddishbrown, arranged in upper half of the lamina.

Near Glao village, 48581.

*Distrib.* : INDIA : North east & South India ; SRI LANKA.

***Pyrrrosia nummulariaefolia*** (Sw.) Ching in Bull. Bot. Soc. 1 : 47. 1935 ; Holttum, Fl. Malaya 2 : 144. 1968 ; Baishya & Rao, Ferns Fern allies Meghalaya 76. 1982. *Acrostichum nummulariaefolium* Sw., Syn. Fil. 191. 418. t. 2. f. 1. 1806. *Polypodium nummulariaefolium* Mett., Farngef. Poly. 123. t. 3. 9. 10. 1857. *Niphobolus nummulariaefolius* J. Smith, J. Bot. 3 : 396. 1841.

Epiphytic fern ; rhizome wide creeping, branched, densely covered with pale - brown, ferruginous, hair - tipped scales. Sori round, close, scattered, sometimes covering the whole lower surface of lamina.

32 mile, M.V. road, 74389 ; Miao forest, 83128 ;

Deban forest, 88661 ; Happy valley area, 83781.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN, BANGLA DESH, CHINA, PHILIPPINES.

***Pyrrosia stenophylla*** (Beddome) Ching in Bull. Chin. Bot. Soc. 1: 55. 1935 ; Jamir & Rao, Ferns Nagaland 99, 1987. *Niphobolus fissus* Hook. var. *stenophyllus* Beddome, Handb. Ferns Brit. India Suppl. 92. 1892.

Epiphytic or lithophytic fern ; rhizome short creeping, densely covered with dark to pale brown, hair tipped scales. Sori small, round or oval, reddish brown, scattered from costa up to margin.

Wakro forest, 70604.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland ; BHUTAN, CHINA.

***Pyrrosia subfurfuracea*** (Hook.) Ching in. Bull. Chin. Bot. Soc. 1 : 68. 1935 ; Dixit, Cens. Indian Pteri. 56. 1984. *Polypodium subfurfuraceum* Hook., Sp. Fil. 5 : 52. 1863. *Niphobolus subfurfuraceus* Beddome, Ferns Brit. India t. 259. 1868.

Epiphytic fern. Fronds ca 1 m long, simple. Sori ashy brown.

40th mile, M.V. road, 78199 ; 29th mile, M.V. road, 86630 ; Near Glao village, 48555.

*Distrib.* : INDIA : North - east India ; MYANMAR, BHUTAN, CHINA.

### DIPTERIDACEAE

***Dipteris wallichii*** (R. Br.) Moore, Ind. Fil. 80. 1857 ; Beddome, Handb. Ferns Brit. India 334. t. 184. 1883. *Polypodium wallichii* R. Br. in Hook. et. Grev., Icon. Fil. t. 168. 1831.

Rhizome clothed with copious, black hard, subulate setaceous scales which are wrinkled at the back. Sori small, round, superficial, copious, scattered in the areoles.

Miao nala, 77507 ; 39th mile, M.V. road, 74345.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya ; BANGLA DESH, CHINA.

### DRYNARIACEAE

***Drynaria propinqua*** (Wallich ex Mett.) J. Smith. in J. Bot. 4 : 62. 1842 ; Beddome, Handb. Ferns Brit. India t. 160. 1866 ; Jamir & Rao, Ferns Nagaland 131. 1987. *Polypodium propinquum* Wallich ex Mett. in Abh. Senckneb. Naturf. Ges. 2 : 120. t. 3. f. 50. 1857.

Epiphytic fern ; rhizome creeping, densely covered with thin, yellowishbrown, linear lanceolate, hair tipped scales. Sori copious, globose, hairy, in a single row on either side of the costa.

25th mile, M.V. road, 87913.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MYANMAR, CHINA, MALAYA, MALAYSIA.

### LYGODIACEAE

*Lygodium flexuosum* (L.) Sw. in Schrad. J. Bot. 1800 (2) : 7. 106. 1801 ; Beddome, Handb. Ferns Brit. India 457. f. 283. 1883. *Ophioglossum flexuosum* L., Sp. Pl. 2 : 1063. 1753.

Twining ferns ; rhizome creeping. Fronds glabrous ; leaflets pinnate, 3 6 cm long, simple or terminal leaflets forked. Sori protruding from the margin ; sporangia arranged in 2 rows.

Jairampur Nampong, 88749 ; Wanu, 16712.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, CHINA, MALAYSIA, PHILIPPINES, AFRICA, AUSTRALIA.

*Lygodium japonicum* (Thunb.) Sw. in Schrad. J. Bot. 1800 (2) : 7. 106. 1801 ; Beddome, Handb. Ferns Brit. India 452. 1883 ; Baishya & Rao, Ferns & Fern allies, Meghalaya 37. 1982. *Ophioglossum japonicum* Thunb., Fl. Jap. 328. 1784.

Twining ferns ; rhizome creeping. Sterile pinnates 3 5 lobed, central lobe much elongated. Sori finger like ; sporangia arranged in 2 rows.

Shirong Hunnung, 88215.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, Arunachal Pradesh, Nagaland, Meghalaya, Western Ghats ; CHINA, JAPAN, PHILIPPINES, AUSTRALIA.

### CHEILANTHACEAE

*Cheilanthes farinosa* (Forsk.) Kaulf., Enum. Fil. 212. 1824. *p.p.* Jamir & Rao, Ferns Nagaland 141. 1987. *Pteris farinosa* Forsk., Fl. Aegypt. Arab 187. 1775. *Aleuritopteris farinosa* (Forsk.) Foc., Gen. Fil. 154. t. 12 B f. 1. 1850.

Rhizome short, erect, clothed with scales, blackish brown. Sori scarious, rounded, in a continuous line close to the margin.

Shirong, 88207, 88212 ; Krosam to Shirong, 88063.

*Distrib.* : INDIA ; Throughtout India ; MYANMAR, CHINA, SRI LANKA, PHILIPPINES, AFRICA, AMERICA.

### CRYPTOGRAMMACEAE

*Onchium siliculosum* (Desv.) C. Chr., Ind. Fil. 469, 1906 ; Jamir & Rao, Ferns Nagaland 143, 1987. *Pteris siliculosa* Desv., Berlin Mag. 5 : 324. 1811. *Onychium auratum* Kaulf., Enum., Fl. 144. 1824.

Terrestrial fern ; rhizome short, semi erect, covered with brown scales. Sori submarginal, continuous along with margins, connected with veinlets.

M.V. road, 79056 ; Deban forest, 88639.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA, FORMOSA, PHILIPPINES, MALAYA ISLANDS, POLYNESIA.

### PTERIDACEAE

*Pteris biaurita* L., Sp. Pl. 2: 1076. 1753 ; Jamir & Rao, Ferns Nagaland 146, 1987. *Campteria biaurita* (L.)Hook., Gen. Fil. t. 65 A. 1841.

Rhizome short, with many crowded roots, covered with dark brown scales. Sori confluent along the margin of the sinus but not reaching the apex of the lobes.

Deban, 83580, 88647 ; Tihun village, 48614 ;

Shoeliang, 10551 ; 38 km., M.V. road, 74f362.

*Distrib.* : INDIA : North east India, Western Ghats ; SRI LANKA, CHINA, MALAYA, TAIWAN, PHILIPPINES, BORNEO, AFRICA, AUSTRALIA.

*Pteris ensiformis* Burm. f., Fl. Ind. 230, 1768 ; Holttum, Fl. Malaya 2: 399, 1968 ; Jamir & Rao, Ferns Nagaland 147, 1987.

Rhizome short creeping, scaly ; scales linear, dark brown. Fronds distinctly dimorphous. Sori marginal, confluent, developing basipetally.

Miao nala, 77527 ; Deban forest, 88629.

*Distrib.* : INDIA : North east India, Western Ghats ; SRI LANKA, MYANMAR, BANGLA DESH, MALAYA, JAPAN, PHILIPPINES, AUSTRALIA.

***Pteris grevilleana*** Wallich ex Agardh, Rec. Sp. Gen. Pteridis 23. 1839 ; Beddome, Handb. Ferns Brit. India 112. 1883.

Erect fern, rhizome creeping, covered with dark brown scales. Sori brown.

West of 40th mile camp, M.V. road, 87691.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR, BANGLA DESH, SINGAPORE, MALAYA, BORNEO.

***Pteris longipes*** D. Don, Prodr. Fl. Nep. 15. 1825 ; Jamir & Rao, Ferns Nagaland 148. 1987, *P. pellucens* Agardh, Rec. Pterid. 43. 1839.

Rhizomes short creeping, apex densely clothed with linear lanceolate, darkbrown, hair pointed scales. Sori confluent, marginal, never extending to the base and apex of segments.

Wakro Glao village, 14604.

*Distrib.* : INDIA : Kashmir, Sikkim, Arunachal Pradesh, Nagaland, Meghalaya, Western Ghats ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, PHILIPPINES, NEW ZEALAND.

***Pteris longipinnula*** Wallich ex. Agardh, Rec. Sp. Gen. Pteridis 19. 1839 ; Jamir & Rao, Ferns Nagaland 150. 1987.

Rhizome erect, densely clothed with linear, reddishbrown scales ; margin of scales densely ciliate. Sori confluent, marginal, continuous almost from base to the apex of the lobes.

27th mile, M.V. road, 86652 ; Pisi village, Miao, 77577.

*Distrib.* : INDIA : Sikkim, North - east & South India ; BANGLA DESH, MALAYA.

***Pteris pellucida*** Presl., Rel. Haenk. 1 : 55. 1825 ; Jamir & Rao, Ferns Nagaland 150, 1987.

Rhizome short, creeping, clothed with short, narrow, darkish scales. Sori usually all along the margins except at apex.

38th - 39th mile, M.V. road, 74357 ; 17th mile M.V. road, 78135 ; Shirong to Hunung, 88211.

*Distrib.* : INDIA : Throughout India ; MYANMAR, MALAYA ISLAND, GUINEA.

***Pteris quadriaurita*** Retz., Obs. Bot. 6: 38. 1791 ; Beddome, Handb. Ferns Brit. India 110. 1883 ; Jamir & Rao, Ferns Nagaland 152. 1987.

Rhizome short, erect or sub erect ; segments of pinnate distinctly cut down to the costate, veins free. Sori blackish brown.

Wakro to Glao lake, 16936.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYA.

***Pteris semipinnata* L., Sp. Pl. 2: 1076. 1753 ; Jamir & Rao, Ferns Nagaland 155. 1987.**

Rhizome short ascending, clothed with very narrow, dark brown scales. Sori linear, continuous along the margins of lobes, except quite near the apices.

Miao nala, 77528 ; Deban forest, 88631 ; Namgoi, 88258.

*Distrib.* : INDIA : Throughout India ; MYANMAR, MALAYA ISLANDS, CHINA, JAPAN.

***Pteris vittata* L., Sp. Pl. 2: 1074. 1753 ; Holttum, Fl. Malaya 2 : 396. 1968 ; Jamir & Rao, Ferns Nagaland 155. 1987.**

Rhizome short, erect to sub erect, densely clothed with long, narrow, thin, entire, palebrown scales. Sori continuous along the margins, except at base and apex.

Deban, 83614, 85113, 88703 ; 34th mile, M.V. road, 87609.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya, South India ; MYANMAR, TAIWAN, MALAYA.

***Pteris wallichiana* Agardh, Rec. Sp. Gen. Pteridis 69. 1839 ; Jamir & Rao, Ferns Nagaland 157. 1987. *Campteria wallichiana* Moore, Ind. Fil. Nep. 12. 1825.**

Rhizome short, ascending ; stipe erect, glabrous, slender, dark purplish. Sori confluent, marginal, confined to basal portion of the lobes.

Lohit river, 10508.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland, Meghalaya ; NEPAL, BHUTAN, PHILIPPINES, JAVA, CHINA, JAPAN.

#### ADIANTACEAE

***Adiantum capillusveneris* L., Sp. Pl. 2: 1096. 1753 ; Holttum, Fl. Malaya 2: 600. 1968 ; Jamir & Rao, Ferns Nagaland 159. 1987.**

Rhizome short creeping, densely clothed with brown, narrow, entire scales. Sori linear, placed in roundish minuses of the crenations ; sporangia globose.

Wakro Glao, 14983.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, EUROPE, AUSTRALIA, AMERICA.

*Adiantum caudatum* L., Mant. Pl. 308, 1771 ; Beddome, Handb. Ferns Brit. India 83, 1883 ; Jamir & Rao, Ferns Nagaland 162, 1987.

Rhizome short, erect, densely scaly. Stipe dark purple, densely covered with dark reddish stiff, spreading hairs. Sori on the apices of the lobes, roundish oblong.

Jairampur Nampong, 88270.

*Distrib.* : INDIA : Throughout India ; MYANMAR, CHINA, SRI LANKA, MALAYA PENINSULA, TAIWAN, PHILIPPINES, JAVA, NEW GUINEA, AFRICA.

*Adiantum philippens* L., Sp. Pl. 2 : 1094, 1753 ; Holttum, Fl. Malaya 2 : 598, 1968 ; Jamir & Rao, Ferns Nagaland 162, 1987.

Rhizome short, erect or sub - erect, scaly. Pinnate up to 1 - 5 cm long, sub orbicular, upper margin of pinnae lobed, truncate ; veins slightly raised. Sori linear, arranged along the edges of lobes, brownish.

1st mile. M.V. road, 78131 ; Waka, 14982.

*Distrib.* : INDIA : Throughout Northern India, Nilgiris ; MYANMAR, SRI LANKA, MALAYA.

### HEMIONITIDACEAE

*Coniogramme fraxinea* (D. Don) Fée ex Diels in Engler & Prantl Nat. Pfl. 1(4) : 262, 1899 ; Jamir & Rao, Ferns Nagaland 167, 1987. *Diplazium fraxineum* D. Don, Prodr. Fl. Nep. 12, 1825. *Gymnogramme fraxinea* (D. Don) Beddome, Ferns Brit. India Suppl. 24, 1876, p.p.

Rhizome long creeping, thick, clothed with narrow lanceolate, dull brown scales. Fronds bipinnate, pinnae glabrous on both surfaces or little pilose beneath. Sori extending along the veins ; spores yellow.

Near Glao village, 48593 ; Kamlat to Walap, 88002.

*Distrib.* : INDIA : West Bengal, Sikkim, Nagaland, Manipur, Meghalaya ; PAKISTAN, NEPAL, SRI LANKA, CHINA, JAVA, MALAYA, TAIWAN, PHILIPPINES, JAPAN.



**Pityrogramma calomelanos** (L.) Link. Handb. Erken. Gew. 3 : 20. 1883 ; Jamir & Rao, Ferns Nagaland 171. 1987. *Acrostichum calomelanos* L., Sp. Pl. 2 : 1072. 1753. *Pteris calomelanos* (L.) Sw. in Schrard. J. 1800. 2 : 70. 1802.

Terrestrial fern with short rhizome, clothed with narrow, dark brown scales. Pinnae in the lower half of the frond more or less equal, covered with a white waxy powdery substance throughout the lower surface. Sporangia borne on veins throughout the lower surface.

Happy valley west, 85133.

*Distrib.* : INDIA : North Western Himalaya, Arunachal Pradesh, Nagaland, Meghalaya ; MALAYA, TAIWAN, AFRICA, AMERICA.

### ANTROPHYACEAE

**Antrophyum henryi** Hiern, Hedwigia 57 : 208. 1915 ; Dixit, Cens. Indian Pteri. 80. 1984.

Rhizome short, creeping fleshy, covered with brown scales. Fronds simple, tufted, broad, sessile. Sori elongated, linear, dark brown.

Nampong Pangsung pass, 20250.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; CHINA.

**Antrophyum obovatum** Baker, Kew Bull. Misc. Inf. 1898 : 238. 1898 ; Dixit, Cens. Indian Pteri. 80. 1984.

Epiphytic fern ; rhizome short, creeping, covered with scales. Fronds simple, obovate, attenuated at the base. Sori without indusium, laciniated, brown.

Jairampur. 26453.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, CHINA, JAPAN.

**Antrophyum plantagineum** (Cav.) Kaulf., Enum. Fil. 197. 1824 ; Beddome, Handb. Ferns Brit. India 403. t. 236. 1883. *Hemionitis plantaginea* Cav., Deser. 260. 1802. *Antrophyum reticulatum* (Forst.) Kaulf., Enum. Fil. 197. 1824.

Rhizome short creeping ; scales dark brown, lanceolate, broad at base. Fronds glabrous, often forked. Sori linear, along the reticulate veins, immersed, often confluent. Sporangia round, pale brown.

17th mile, M.V. road, 83741 ; Zero mile point, 84909 ; Chowkham, 48337.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Assam, Manipur, Meghalaya, Kerala, Tamilnadu ; SRI LANKA, MALAYA PENINSULA, POLYNESIA, QUEENSLAND.

### VITTARIACEAE

*Vittaria doniana* Hieron, Hedwigia 57: 204. 1916, Dixit, Cens Indian Pteri. 81. 1984.

var. *doniana*

Epiphytic fern with short creeping rhizome covered with scales. Fronds ca 1 cm broad dull green, Sori dark brown, arranged in two rows along its margins except at tip.

Warko Glao, 48781.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Manipur ; PHILIPPINES, TAIWAN.

*Vittaria elongata* Sw., Syn. Fil. 109, 302. 1806 ; Holttum, Fl. Malaya 2: 614. 1968 ; Jamir & Rao, Ferns Nagaland 174, 1987.

Terrestrial fern with short creeping rhizome. Fronds glabrous, tapering gradually towards both ends. Sori sunk in marginal grooves, linear ; sporangia short-stalked.

Deban Bulbulia, 78160 ; 27th mile. M.V. road, 86657 ;

40th mile, M.V. road, 78177.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, MAURITIUS, MALAYA, QUEENSLAND, POLYNESIA.

*Vittaria sikkimensis* Kuhn, Linnaea 36: 66. 1869 ; Dixit, Cens. Indian Pteri. 82.1984.

Epiphytic ferns with short creeping rhizome, covered by brown pointed narrow scales. Fronds very narrow. Sori borne along the marginal veins, numerous, brown.

33rd Mile, M.V. road, 74386, 87634 ; Glao village, 48554.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Assam ; CHINA.

*Vittaria zosterifolia* Willd. in Linn., Sp. Pl. 5 : 406. 1810 ; Jamir & Rao, Ferns Nagaland 175. 1987.

Epiphytic fern, rhizome slender, wide creeping ; scales linear lanceolate, subentire, black. Fronds gradually tapering towards base, midrib indistinct. Sori immersed.

27th mile, M.V. road, 86656.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Andaman & Nicobar Islands ; CHINA.

### PARKERIACEAE

**Ceratopteris thalictroides** (L.) Ad. Brongn., Bull. Soc. Philom. Paris 1821: 186. 1822 ; Holttum, Fl. Malaya 2: 578. 1968 ; Jamir & Rao, Ferns Nagaland 179. 1987. *Acrostichum thalictroides* L., Sp. Pl. 2 : 1070. 1753.

Aquatic fern ; rhizome fleshy, erect ; scales thin, pale brown. Fronds dimorphic, bi - tripinnate. Sporangia borne in a single line along marginal veins, globose, dehiscence transverse.

Happy valley west, 85127.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya, South India ; Tropics & Sub tropics of the World.

### HYMENOPHYLLACEAE

**Mecodium exsertum** (Wallich ex Hook.) Copel., Philip. J. Sci. 67: 23. 1938 ; Baishya & Rao, Ferns & Fern allies, Meghalaya 44. 1982. *Hymenophyllum exsertum* Wallich ex Hook., Sp. Fil. 1 : 109. t. 38 A. 1844.

Rhizome wiry, wide creeping ; main rachis more or less densely clothed with ferruginous hairs. Sori abundant on the upper pinnae, usually on very short lobes.

Hunung Sheoliang, 10579 A.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, MALAYA.

**Mecodium polyanthos** (Sw.) Copel., Philip. J. Sci. 67: 19. 1938 ; Jamir & Rao, Ferns Nagaland 186. 1987. *Hymenophyllum polyanthos* Sw., Schrad. J. Bot. 1800(2): 102. 1801.

Rhizome wiry, wide - creeping. Rachis narrowly winged above, more or less hairy throughout the surface. Sori terminal or axillary on the segments of lobes.

Hunung Sheoliang, 10579 B.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, Tropics & Sub tropics of the World.

**Vandenboschia auriculata** (Blume) Copel., Philip. J. Sci. 67: 55. 1938 ; Holttum Fl. Malaya 2: 105. 1954 ; Baishya & Rao, Ferns

& Fern allies, Meghalaya 45. 1982. *Trichomanes auriculatum* Blume, Jav. 225. 1828.

Rhizome slender, wiry, creeping covered with brown long hairs. Rachis winged ; pinnales oblique oblong. Sori arranged on slender receptacles, brown.

26th mile, M.V. road, 86667 ; East of Deban, 85089.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; JAPAN, FORMOSA, JAVA, PHILIPPINES, GUIANA.

### DICKSONIACEAE

*Cibotium barometz* (L.) J. Smith, Lond. J. Bot. 1: 437. 1842 ; Jamir & Rao, Ferns Nagaland 194. 1987. *Polypodium barometz* L., Sp. Pl. 2 : 10. 1092. 1753.

Tree fern ; rhizome stout, prostrate. Fronds tripinnatifid, glabrous but covered by whitish powdery substances on both surfaces. Sori globose, terminal on the veins.

22nd mile, M.V. road, 87864 ; Miao forest, 78115.

Namgoi forest, 88264. A.

*Distrib.* : INDIA : North east India ; MYANMAR, CHINA, MALAYA, MALAYSIA, AUSTRALIA.

### CYATHEACEAE

*Cyathea brunoniana* (Wallich ex Hook.) C.B. Clarke & Baker in J. Linn. Soc. Bot. 24 : 409. 1888 ; Jamir & Rao, Ferns Nagaland 198. 1987. *Alsophila brunoniana* Wallich ex Hook., Sp. Fil. 3 : 52. 1844.

Large tree fern up to 4 - 5 m tall. Rachis yellowish brown to dark brown. Fronds bipinnate. Sori large, globose, arranged in two rows, one on either side of costule from base to the tip of segments.

Namgoi, 88264 B.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR, BANGLA DESH, VIETNAM.

*Cyathea gigantea* (Wallich ex Hook.) Holttum, Gard. Bull. Str. Sett. 8: 318. 1935 ; Jamir & Rao, Ferns Nagaland 199. 1987. *Alsophila gigantea* Wallich ex Hook., Sp. Fil. 1 : 53. 1844.

Tree fern with massive trunk, erect up to 5 m tall. Stipe dark to black - purplish, linear scaly at base with hooked margins. Fronds

bipinnate. Sori rather large, globose on veins away from costules, forming an inverted "V" shaped.

27th mile, M.V. road, 87900.

*Distrib.* : INDIA : Throughout India in the hilly regions ; NEPAL, MYANMAR, SRI LANKA, BANGLA DESH, CHINA, THAILAND, LAOS.

*Cyathea spinulosa* Wallich ex Hook., Sp. Fil. 1: 25. t. 12. 1844 ; Jamir & Rao, Ferns Nagaland 202. 1987. *Alsophila spinulosa* (Hook.) Tryon in Contr. Gray. Herb. (200): 32.1970.

Prickly tree fern ca 4 - 5 m high. Stipes and rachis strongly aculeate or spiny, dark brown scaly at base ; pinnules dentate. Sori globose, large copious near the costules in one row on either side of the costa.

25th mile, M.V. road, 87912 ; Miao forest, 79112.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND, FORMOSA, JAPAN.

### DENNSTAEDTIACEAE

*Microlepia speluncae* (L.) Moore., Ind. Fil. 93. 1857 ; Beddome, Handb. Ferns Brit. India 67. 1883 ; Jamir & Rao, Ferns Nagaland 215. 1987. *Polypodium speluncae* L., Sp. Pl. 2 : 1093. 1753.

Large fern with stout creeping rhizome. Frond ternately compound 1 m large, pubescent. Costules and veins short hairy on both surfaces. Sori near the base of the sinuses between the lobes, more or less opposite.

West of 40th mile, I.B. 87692.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya, South India ; BANGLA DESH, SRI LANKA, MALAYA, POLYNESIA, Tropical AMERICA.

*Microlepia strigosa* (Thunb.) Presl., Epim. Bot. 95. 1849 ; Holttum, Fl. Malaya 2: 310. 1968 ; Jamir & Rao, Ferns Nagaland 215. 1987. *Trichomanes strigosa* Thunb., Fl. Jap. 339. 1784.

Rhizome short thick, wide creeping densely covered with ferruginous hairs ; rachis densely short hairy. Sori sub - globose, depressed, submarginal, solitary on each pinnule ; inducium marginal.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya, South India ; SRI LANKA, MALAYA, POLYNESIA.

### PTERIDIACEAE

*Pteridium aquilinum* (L.) Kuhn in Von der Deck., Reis. 3(3) : 11. 1879 ; Beddome, Ferns South India t. 44. 1863 ; Jamir & Rao, Ferns Nagaland 223. 1987. *Pteris aquilina* L., Sp. Pl. 2 : 1075. 1753. *Pteridium aquilinum* subsp. *typicum*. Tryon in Rhodora 43 : 15. 1941.

Rhizome wide creeping, densely clothed with fine, pale brown hairs, scaleless. Rachis hairy but almost glabrous beneath. Sori copious, continuous along the margin of segments.

Deban forest, 78991.

*Distrib.* : INDIA : Throughout India ; CHINA, JAPAN, SRI LANKA, TAIWAN, EUROPE, AMERICA.

### LINDSAEACEAE

*Lindsaea cultrata* (Willd.) Swartz., Syn. Fil. 119. 1806 ; Beddome, Handb. Ferns Brit. India Suppl. 72 t. 36. 1892 ; Baishya & Rao, Ferns & Ferns allies, Meghalaya 96. 1982. *Adiantum cultratum* Willd. in Phytogra. 14, t. 10. f. 2, 1794.

Rhizome creeping, wiry dark brown. Fronds usually glabrous, sometimes finely pubescent. Sori terminal, on each venetlets, continuous.

Nampong, 88673, 14738.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MYANMAR, BANGLA DESH, SRI LANKA, MALAYA PENINSULA, MALAYSIAN ISLANDS, NEW GUINEA, PHILIPPINES.

*Lindsaea ensifolia* Sw., Schrad. J. Bot. 1800 (2) : 77. 1801 ; Jamir & Rao, Ferns Nagaland 229. 1987. *Schizoloma ensifolia* (Sw.) J. Smith in J. Bot. 3 : 414. 1841.

Rhizome stout, short creeping, covered with narrow brown scales. Sori linear, brown, continuous along both margins except at extreme tip.

Wakro Glao village, 14887.

*Distrib.* : INDIA : Throughout India ; BANGLA DESH, MYANMAR, SRI LANKA, CHINA, MALAYA, MALAYSIAN ISLANDS, AFRICA, AUSTRALIA.

## ASPLENIACEAE

**Asplenium bullatum** Wallich ex. Mett. in Abh. Sendhenb, Gas, Frankfrut. 3 : 150. 1859 ; Jamir & Rao, Ferns Nagaland 277. 1987.

Rhizome short, erect, clothed with hairtipped scales ; stipe erect greenish with lanceolate, alternate scales at base, glabrous above or slightly hairy. Sori linear brown, oblique to the costae, one on each lobe, often spreading on the whole lobe, not reaching the margins.

Krosam 950 m, 88079.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland ; NEPAL, MALAYA PENINSULA, NEW ZEALAND, MEXICO, NEW CALEDONIA, AUSTRALIA.

**Asplenium cheilosorum** Kuntze ex Mett., Aspl. 133. t. 5. f. 12 - 13. 1859 ; Jamir & Rao, Ferns Nagaland 277. 1987. *A. heterocarpum* Wallich ex Hook., Sp. Fil. 3 : 132. t. 175. 1860.

Rhizome hard, creeping, clothed with narrow, dark brown, ovate - lanceolate, hair - tipped scales. Sori elongate up to 0.3 cm long, oblique vertical to the costae, confined to the lobes, usually one or rarely two, brown.

27th mile, M.V. road, 86653 ; Miao forest, 78106 ;

40th mile, M.V. road, 87687.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya, South India ; NEPAL, BHUTAN, SRI LANKA, MALAYA PENINSULA, CHINA, BORNEO, FORMOSA, PHILIPPINES.

**Asplenium finlaysonium** Wallich ex Hook., Icon. Pl. t. 937. 1854 ; Jamir & Rao, Ferns Nagaland 281. 1987. *Hemidictyum finlaysonium* Moore, Index Fil. 50. 1857.

Rhizome short creeping, apex covered with black to dark - brown scales ; rachis usually glabrous with distinct lateral veins. Sori elongated, linear, oblique.

Near Noa-Dihing, 84939 ; Deban forest, 88675 ; Miao forest 81125.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya ; BANGLA DESH, MALAYA PENINSULA.

**Asplenium laciniatum** D. Don, Prodr. Fl. Nep. 8. 1825; Mehra & Bir, Res. Bull. Punjab Univ. (N.S.) 15: 157. 1964 ; Jamir & Rao, Ferns Nagaland 282. 1987.

Rhizome short, erect or slightly creeping, densely clothed with dark brown scales. Sori copious, linear pale brown.

*Distrib.* : INDIA : Uttar Pradesh, Arunachal Pradesh, Nagaland, Meghalaya, Western Ghats ; BHUTAN, SRI LANKA, JAPAN, TAIWAN.

*Asplenium nidus* L., Sp. Pl. 2 : 1079. 1753 ; Holttum, Fl. Malaya 2: 419. 1968 ; Jamir & Rao, Ferns Nagaland 284, 1987. *Thamnopteris nidus* Presl., Epim. Bot. 68. 1849.

Epiphytic fern ; rhizome short, erect, apex clothed with thin, clathrate, broad acuminate black to dark purplish scales. Sori linear, borne along each veinlet on upper half of the lamina.

Miao nala, 78101 ; Deban forest, 88651 ;

Jairampur, 19962 ; 10 km away from Deban, 83635.

*Distrib.* : INDIA : Uttar Pradesh, Arunachal Pradesh, Nagaland, Meghalaya ; POLYNESIA, TAIWAN, PHILIPPINES, MALAYA, SRI LANKA, Tropical ASIA, AFRICA.

*Asplenium nitidum* Sw., Syn. Fil. 84. 280. 1806 ; Jamir & Rao, Ferns Nagaland 286. 1987.

Epiphytic ; rhizome stout, short creeping, the apex densely with thin, pale purplish brown, hair tipped scales. Sori contiguous, straight, oblique to costae not reaching to margin.

Pisi village Miao, 77557 ; 16th mile, M.V. road, 85181.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland, Meghalaya, Nilgiris ; BHUTAN, SRI LANKA, MALAYA, South AFRICA.

*Asplenium prolongatum* Hook., 2nd Cent. Ferns t. 42. 1860 ; Dixit, Cens. Indian Pteri. 121, 1984.

Epiphytic fern, bright green, caespitose, caudex green. Sori along one margin of the pinnule.

Giao village, 48539.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, South India ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, JAPAN, FIJI, AFRICA.

*Asplenium sorelii*, Hook. in Blakistom, Yantsze, 363 364. 1862 ; Dhir, Ferns N.W. Himalayas 110. 1980 ; Jamir & Rao, Ferns Nagaland 289. 1987. *A. saulii* Baker in Syn. Fil. ed. 2: 216. 1874.



Rhizome short creeping, more or less densely covered with black to dark brown, lanceolate, hair pointed scales. Sori linear, elongate, often confluent.

*Distrib.* : INDIA : N.W. Himalaya, Arunachal Pradesh, Nagaland ; CHINA, JAPAN.

**Asplenium unilaterale** Lam., *Encycl. Meth. Bot* 2: 305. 1786 ; Holttum, *Fl. Malaya* 2: 438. 1968 ; Jamir & Rao, *Ferns Nagaland* 292. 1987.

Terrestrial fern ; rhizome creeping, apex covered with brown hair-tipped scales. Sori usually copious, linear, median, oblique to the costa, pale brown.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Western Ghats ; NEPAL, BHUTAN, BANGLA DESH, SRI LANKA, CHINA, JAPAN, POLYNESIA, AFRICA.

#### ATHYRIACEAE

**Athyrium drepanopterum** (Kuntze) A. Br. ex Milde, *Fil. Fur.* 49. 1987 ; Baishya & Rao, *Ferns & Fern allies Meghalaya* 138. 1982. *Polypodium drepanopterum* Kuntze in *Linnaea* 23 : 318. 1850. *Athyrium oxyphyllum* Moore, *Ind. Fil.* 49. 1857.

Rhizome erect or semi erect, densely covered with narrowly linear, lanceolate, entire reddish brown, hair tipped scales. Sori reniform, medial on veinlets, brown.

27th mile, M.V. road, 86647.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya, South India ; BHUTAN, MYANMAR, CHINA, PHILIPPINES, TAIWAN.

**Diplazium asperum** Blume, *Enum. Pl. Jav.* 195. 1828 ; Jamir & Rao, *Ferns Nagaland* 308, 1987. *Athyrium asperum* (Blume) Milde., *Bot. Zeit.* 353. 1870.

Rhizome short, erect, stout, sometimes sub arborescent, scaly at apex. Stipes densely covered with dark brown scales at base. Sori dorsal on the veins, globose.

Way to Sheoliang, 10558 ; Near Deban, 85060.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland ; JAVA, MALAYA.

**Diplazium bentamense** Blume, Enum. Fl. Jav. 191, 1828 ; C.B. Clarke in Trans. Linn. Soc. Ser. 2 (Bot.) 1 : 479, 1880 ; Jamir & Rao, Ferns Nagaland 308, 1988. *Athyrium bentamense* (Blume) Milde, Bot. Zeit. 353, 1870 ; Baishya & Rao, Ferns & Fern allies, Meghalaya 138, 1982.

Rhizome short, sub erect, with blackish roots ; stipes dark brown, clothed at base with linear dark - brown scales. Sori linear along the veins, brown.

34th mile, M.V. road, 87624.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya, Western Ghats ; CHINA, MALAYA.

**Diplazium esculentum** (Retz.) Sw., Schrad. J. Bot. 1801 (1) , 312, 1803 ; Jamir & Rao, Ferns Nagaland 311, 1987. *Hemionitis esculenta* Retz., Obs. Bot. 4 : 38, 1791.

Tall fern with 2 m or more high ; frond large about 2 m long, pinnae fertile. Sori linear, continuous along almost whole length on both sides of the veins, brown.

27th mile, M.V. road, 86658.

*Distrib.* : INDIA : West Bengal, Arunachal Pradesh, Nagaland, Meghalaya, Western Ghats ; BANGLA DESH, CHINA, MALAYA, FORMOSA.

**Diplazium maximum** (D. Don) C. Chr., Ind. Fil. 235, 1905 ; Mehra & Bir in Res. Bull. Punjab Univ. (N.S.) 15 : 147, 1964 ; Jamir & Rao, Ferns Nagaland 312, 1987. *Asplenium maximum* D. Don, Prodr. Fl. Nep. 8, 1825., *Athyrium dilatatum* (Blume) Milde, Bot. Zeit. 533, 1870.

Rhizome short, stout, densely covered with black or dark - brown scales. Sori up to 1 cm long, linear, brown, oblique to midrib.

On the way to Sheoliang, 10867.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland and throughout Himalayan region ; CHINA, JAVA, MALAYA, TAIWAN.

### ASPIDIACEAE

**Tectaria polymorpha** (Wallich ex Hook.) Copel., Philip. J. Sci. 2 C : 413, 1907 ; Holttum, Fl. Malaya 2 : 518, 1968 ; Jamir & Rao, Ferns Nagaland 364, 1987.

Rhizome short, erect or sub erect, densely clothed with stiff, shining, dark brown scales. Sori dorsal on the connecting or netted veins, scattered all over, small generally round, superficial, brownish.

22nd mile, M.V. road, 83629.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya, Western Ghats ; BANGLA DESH, MYANMAR, SRI LANKA, MALAYA, PHILIPPINES.

*Tectaria vasta* (Blume) Copel. in Philip. J. Sci. 2 C : 411. 1907 ; Jamir & Rao, Ferns Nagaland 366. 1987. *Aspidium vastum* Blume, Enum. Pl. Jav. 142. 1828.

Rhizome short creeping to erect, massive ; apex densely covered with stiff, dark - brown scales. Sori wide, round, scattered on the netted veins, brown.

17th mile, M.V. road, 83740 ; East of Deban on the way to Bulbulia, 86603.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland, Meghalaya ; BANGLA DESH, MYANMAR, SUMATRA, MALAYA.

### DRYOPTERIDACEAE

*Dryopteris sparsa* (D. Don) O. Ktze, Rev. Gen. Pl. 2 : 613. 1891 ; Holttum, Fl. Malaya 2 : 492. & 292. 1968 ; Jamir & Rao, Ferns Nagaland 334. 1987. *Nephrodium sparsum* D. Don, Prodr. Fl. Nep. 6. 1825.

Rhizome short, densely covered with broad - lanceolate, reddish to pale brown scales. Sori rather large, globose, usually one per lobe, brownish.

Deban Bulbulia, 78158 ; Salt lick forest, Miao, 83574.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, CHINA, MALAYA, JAPAN, TAIWAN.

*Polystichum aculeatum* (L.) Roth in Rom. Arch. 2 : 106. 1799 ; Beddome, Handb. Ferns Brit. India 207. 1881 ; Baishya & Rao, Ferns & Fern allies Meghalaya 132. 1982. *Polypodium aculeatum* L., Sp. pl. 2 : 1090. 1753, *p.p.*

Rhizome erect, stout, densely covered with thick blackish brown scales. Rachis and costae more or less densely clothed with

dark - brown, lanceolate scales. Sori on the veinlets, margin slightly lobed.

25th mile, M.V. road, 87915.

*Distrib.* : INDIA : Throughout India at high elevation ;  
Cosmopolitan.

*Polystichum biaristatum* (Blume) Moore, Ind. Fil. 86.1858 ;  
Jamir & Rao, Ferns Nagaland 343. 1987. *Aspidium biaristatum* Blume,  
Enum. Fl. Jav. 164. 1828.

Rhizome semi - erect ; roots wiry, spreading stipes, covered with  
thick and blackish scales. Sori large, usually terminal on the veinlets,  
dark brown.

Krosam, 88039 ; 39th mile, M.V. road, 87671.

*Distrib.* : INDIA : N.W. Himalaya, West Bengal, Arunachal  
Pradesh, Assam, Nagaland, Meghalaya ; MYANMAR, SRI LANKA,  
CHINA, JAVA, MALAYA, TAIWAN, VIETNAM.

*Polystichum lentum* (D. Don) Moore, Ind. Fil. 86. 1858 ; Jamir  
& Rao, Ferns Nagaland 347. 1987. *Aspidium lentum* D. Don, Prodr.  
Fl. Nep. 4. 1825.

Rhizome erect, densely covered with oblique - ovate, dark -  
brown scales ; stipes tufted, densely scaly at base. Sori wide, rather  
large, reniform.

41st mile, M.V. road, 74312 ; Near Wakro, 10927.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland,  
Meghalaya ; NEPAL, MYANMAR.

*Polystichum semifertile* (C.B. Clarke) Ching in Lingn. Sci. J.  
15 : 398. 1936 ; Jamir & Rao, Ferns Nagaland 350. 1987. *Aspidium*  
*aculeatum* var. *semifertile* C.B. Clarke in Trans. Linn. Soc., 2, (Bot) :  
509. 1880. *Polystichum aculeatum* var. *semifertile* Beddome, Handb.  
Ferns Brit. India 209. 1883.

Rhizome erect to semi erect, densely covered with black  
brown scales, stipes slender, tufted, densely covered with dark - brown  
ramenta. There is gap in between fertile and sterile regions of the  
fronds. Inducium broad, entire.

10th km away from Deban, 83666.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya.

**LOMARIOPSIDACEAE**

**Egenolfia appendiculata** (Willd.) J. Smith, Ferns Brit. For. 111. 1880 ; Jamir & Rao, Ferns Nagaland 372. 1987. *Acrostichum appendiculatum* Willd., Sp. Pl. 5 : 114. 1810.

Rhizome short creeping, covered with narrow, blackish - brown, scales. Fronds simple pinnate, dimorphic ; stipe of fertile fronds longer than sterile ones. Sporangia blackish brown, entirely covering the lower surface.

Miao forest, 79220.

*Distrib.* : INDIA : Throughout India ; JAVA, MALAYSIA, TAIWAN, THAILAND.

**BOLBITIDACEAE**

**Bolbitis costata** (Wallich ex Hook.) Ching, C. Chr. Ind. Fil. Suppl. 3 : 47. 1934 ; Dixit, Cens. Indian Pterid. 161 - 162. 1984. *Acrostichum costatum* Wallich ex Hook., Sp. Pl. 5 : 262. 1864

Rhizome creeping or ascending, dorsiventral ; stipes distinct or tufted, not articulated to rhizome covered with brown scales at the base. Fronds dimorphic. Sporangia along the veins.

17th mile. M.V. road, 78130.

*Distrib.* : INDIA : North east India ; NEPAL, BANGLA DESH.

**NEPHROLEPIDACEAE**

**Nephrolepis cordifolia** (L.) Presl., Tent. Pterid. 79. 1836 ; Jamir & Rao, Ferns Nagaland 385. 1987. *Polypodium cordifolium* L., Sp. Pl. 2 : 1089. 1753.

Rhizome short, erect, densely clothed with thin, yellowish brown, entire, linear, hair pointed scales. Sori round, arranged in a single, submarginal row, brownish ; indusium reniform, oblique to the veins.

17th mile forest, 78129.

*Distrib.* : INDIA : Throughout India ; JAPAN, MALAYA, TAIWAN, NEW ZEALAND.

**OLEANDRACEAE**

**Oleandra wallichii** (Hook.) Presl., Tent. Pterid. 78. 1836 ; Jamir & Rao, Ferns Nagaland 387. 1987. *Aspidium wallichianum* Hook., Exot. Fl. 1. t. 5. 1823.

Rhizome long, creeping ; scales dense, hair - tipped, light brown. Sori round, in a single row on either side of costa, nearly touching costa ; indusia reniform, ciliate.

Wakro Hunung, 16827.

*Distrib.* : INDIA : Simla to Arunachal Pradesh, Assam, Nagaland, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA, TAIWAN, MALAYA.

### DOVALLIACEAE

*Humata griffithiana* (Hook.) C. Chr., Centr. U.S. Nat. Herb. 26 : 293. 1931 ; Dixit, Cens. Indian Pterid. 171. 1984. *Davallia griffithiana* Hook., Sp. Fil. 1 : 168. t. 493. 1846.

Rhizome thick, fleshy, long creeping, densely clothed with long, white or yellowish hair - tipped scales. Sori large, globose, sub marginal or marginal.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN, MYANMAR, CHINA, FORMOSA.

*Humata repens* (L.f.) Diels in Nat. Pfl. 1(4) : 209. 1889 ; Holttum, Fl. Malaya 2 : 371. 1968 ; Jamir & Rao, Ferns Nagaland 397. 1987. *Adiantum repens* L. f., Suppl. 446. 1781.

Rhizome thick, slender, long creeping, densely clothed with peltate lanceolate, brown scales. Sori small, elongate, in rows on the teeth on both sides of the lobes.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Western Ghats ; SRI LANKA, BHUTAN, CHINA, JAPAN, MALAYA, TAIWAN, AUSTRALIA.

### BLECHNACEAE

*Blechnum orientale* L., Sp. Pl. 2 : 1077. 1753 ; Holttum, Fl. Malaya 2 : 446. 1968 ; Jamir & Rao, Ferns Nagaland 403. 1907.

Rhizome short, erect, densely covered with dark - brown scales at the apex. Sori linear, costal, continuous nearly to apex, brown, adjacent to the costa.

Deban, 79057 ; Jairampur, 88250 ; Nampong forest, 88699.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, CHINA, MALAYA PENINSULA, MALAYSIAN ISLANDS, POLYNESIA, AUSTRALIA.

**Woodwardia unigemmata** (Makino) Nakai, Bot. Mag. Tokyo 39 : 103. 1925 ; Dixit, Cens. Indian Pteri. 173. 1984.

Rhizome scales broad, membranous, brown. Fronds bipinnatifid, large, spreading. Sori short, rectangular.

Shirong to Hunung, 88221 ; Deban forest, 85933.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; CHINA, JAPAN, TONKIN, FORMOSA, PHILIPPINES.

### SALVINIACEAE

**Salvinia natans** (L.) All., Fl. Pedem. 2 : 289. 1785 ; Baker in Fern allies 173. 1887 ; Jamir & Rao, Ferns Nagaland 406. 1987. *Marsilea natans* L., Sp. Pl. 2 : 1099. 1753.

Small aquatic, free floating ferns ; rhizome small, clothed with hairs ; roots absent. Sporocarps some containing megasporangia and others microsporangia, covered by minute multicellular hairs.

Noa Dihing river, near Namsai, 47820.

*Distrib.* : INDIA : Indo - gangetic plains, Arunachal Pradesh, Nagaland, Meghalaya ; AFRICA, EUROPE, AMERICA.

### GYMNOSPERMS

#### PINACEAE

**Pinus merkusii** Jungh & De Vries in Plant Nov. Ind. Bot. Or. 5, t. 2. 1845 ; Hook. f., Fl. Brit. India 5 : 652. 1890.

Large trees, ca 20 m tall. Needles 2, smooth, slender fimbriate. Cones ca 10 cm long, woody, young ones green.

*Fl. & Fr.* : August - March.

Krosam, 88043 ; Near Tugin - Kunung, 87975.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR, SUMATRA, BORNEO.

**Abies delavayi** Franchet in J. de Bot. 255. 1899 ; Jain & Sastry, Threatened Plants India - A State of the Art Report, 1. 1980.

Medium sized tree. A Chinese fir recorded from Arunachal Pradesh, but could not be collected during recent explorations.

*Distrib.* : INDIA : Arunachal Pradesh ; CHINA.

## CEPHALOTAXACEAE

*Cephalotaxus griffithii* Hook. f., Fl. Brit. India 5 : 648, 1890.

Small trees. Leaves linear, acuminate, rounded at base, falcate ; white beneath.

There is no recent collection of this species, which has reported under cultivation at kew gardens.

Griffith s.l., 5000.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur.

## GNETACEAE

*Gnetum gnemon* L., Mant. 1 : 127, 1767 ; Hook. f., Fl. Brit. India 5 : 641, 1890.

Large shrubs. Leaves opposite, ca 18 cm, elliptic lanceolate or broadly oblong, acuminate, coriaceous, color present. Spike terminal at short branchlets ; seeds sub - globose, greenish pink ; eaten by local people.

*Fl. & Fr.* : February July.

Jairampur forest, 81181.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya ; MALAYA.

*Gnetum ula* Brongn. in Duperrey, Voy. Coquille 7 : 12, 1829 ; Santapau, Fl. Khandala ed. 3 : 261, 1967. *G. scandens* Brandis, For. Fl. 502, 1874 ; Hook. f., Fl. Brit. India 5 : 642, 1890.

Evergreen liana ; young shoot jointed and nodes swollen. Leaves 6 10 × 4 6 cm, elliptic ovate, obtusely acuminate, pale beneath. Flowers dioecious. Fruits orange yellow.

*Fl. & Fr.* : February June.

40th mile, M.V. road, 79177 ; Jairampur forest, 81191.

*Distrib.* : INDIA : Sikkim, North east region, Western Ghats, Andaman Islands ; MALAYA.

## ANGIOSPERMS

## RANUNCULACEAE

*Aconitum lethale* Griffith, Notul. 4 : 732, 1851 & Icon. Pl. Asiat. 460 f. 3, 1854 ; Stapf in Ann. R. Bot. Gard. Calc. 10 : 175, 1905 ;



Mukherjee in Bull. Bot. Surv. India 3 : 100. 1966. *A. palmatum* Hook. f. & Thomson in Fl. Brit. India 1 : 28. 1871, *p.p.*

Herbs ca 1 m tall. Leaves 8-12 × 2.5-3 cm, rounded or oval, palmately 5-lobed. Flowers on straight pedicels, semi orbicular in profile, greenish-blue.

*Fl. & Fr.* : August-December.

Kumaon Bum, 78778.

*Distrib.* : INDIA : Arunachal Pradesh. Endemic.

*Note* : The tribal people grind the root (Rhizome) into a paste and fix it on the sharp iron tip of the arrows due to its gummy substance. The root is strongly poisonous and even an elephant can be killed with it.

*Clematis acuminata* DC., Syst. 1 : 148. 1817 ; Hook. f. & Thomson in Fl. Brit. India 1 : 5. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 4. 1934.

Lesu : *Sangriat*

Slender woody climbers ; branches purplish red. Leaves opposite, pinnately 3-foliolate. Flowers tomentose in bud, pale yellow.

*Fl. & Fr.* : December-March.

Tulung-Kunung, 87964 ; on way to 40th mile, 99585 ; Gandhigram, 99684.

*Distrib.* : INDIA : North-east & South. India.

*Ranunculus cantoniensis* DC., Prodr. 1 : 43. 1824 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 51. 1985. *R. pennsylvanicus* auct. non L., 1753 ; Hook. f. & Thomson in Fl. Brit. India 1 : 19. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 9. 1934.

Small herbs, erect, annual or biennial, stem ca 30 cm tall. Leaves ternately divided into 3 leaflets ; each leaflets cut into oblanceolate lobes, pubescent. Flowers small, 1.5-2.7 cm across, yellow. Achenes broadly elliptic, compressed, surrounded by marginal rim.

*Fl. & Fr.* : May-December.

27th mile camp, 84941 ; 34 mile, M.V. road, 87631.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam, Meghalaya ; NEPAL, CHINA, AMERICA.

## DILLENACEAE

**Dillenia indica** L., Sp. Pl. 1 : 535, 1753 ; Hook. f. & Thomson in Fl. Brit. India 1 : 36, 1872 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 52, 1985.

Asm. : *Ou tenga*.

Evergreen trees, ca 30 m tall. Flowers solitary, terminal, 15-20 cm across, white, appearing with leaves. Fruits globose, green.

Fl. & Fr. : July - February.

M' Pen Check gate, 83172.

Distrib. : INDIA : Throughout India ; MYANMAR, SRI LANKA, THAILAND, INDO-CHINA, MALAYSIA.

**Dillenia pentagyna** Roxb., Pl. Corom. 1 : 21, t. 20, 1795 ; Hook f. & Thomson in Fl. Brit. India 1 : 38, 1872 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 53, 1985.

Asm. : *Banjilou*

Deciduous trees, ca 15 m high, bark grey, profuse flowering while leafless. Flowers 3-8, fascicled, bright yellow. Fruits sub globose.

Fl. & Fr. : March - September.

M' Pen forest, 81031 ; Miao forest, 83126.

Distrib. : INDIA : Uttar Pradesh to Arunachal Pradesh, Andamans ; MYANMAR, SRI LANKA, CHINA, MALAYSIA.

## MAGNOLIACEAE

**Magnolia griffithii** Hook. f. & Thomson Fl. Ind. 77, 1855 & in Fl. Brit. India 1 : 41, 1872 ; Kanjilal *et al.* Fl. Assam 1 : 14, 1934. *M. pealiana* King in Ann. R. Bot. Gard. Calc. 210, t. 59, 1891.

Evergreen trees, up to 10 m high. Flowers 8-12 cm across, white ; stamens and carpels numerous.

Fl. & Fr. : April - November.

Miao Bum forest, 38126.

Distrib. : INDIA : Endemic, North-eastern India.

**Magnolia hodgsonii** (Hook. f. & Thomson) King in Gard. Bull. Singapore 31 (2) : 129, 1978. *Talauma hodgsonii* Hook. f. & Thomson,

Fl. Ind. 1 : 74. 1855 & in Fl. Brit. India 1 : 40. 1872 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 62. 1985.

Asm. : *Boromthuri, Dat - bhola*

Trees, 10 - 15 m high, bark greenish brown, often warty. Flowers terminal, white or pale pink, never fully opens. Fruits dehiscent along ventral suture.

Fl. & Fr. : April - June.

Deban forest, 83652 ; Salt lick forest ;

Miao Bum, 83793 ; P. Kund, 99451.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

*Magnolia pterocarpa* Roxb., Pl. Corom. 3 : 62. t. 266. 1820 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 56. 1985. *M. sphenocarpa* Wallich ex Hook. f. & Thomson, Fl. Ind. 78. 1855 & in Fl. Brit. India 1 : 41. 1872.

Asm.: *Thouthua, Baramphuri - sopa.*

Medium sized trees, ca 15 m high, bark grey, smooth. Flowers 8 - 12 mm across, white ; mature carpels recurved.

Fl. & Fr. : May - December.

Miao Bum forest, 81090.

*Distrib.* : INDIA : Uttar Pradesh to North - east India ; NEPAL, MYANMAR.

*Michelia baillonii* (Pierre) Finet Gagnepain in Mem. Soc. France (4) : 46. 1905. *Magnolia baillonii* Pierre, Fl. For Cochinch. 1 : t. 2. 1879. *Talauma phellocarpa* King in Ann. R. Bot. Gard. Calc. 3 : 205, t. 47. 1891 ; Kanjilal *et al.*, Fl. Assam 1 : 18. 1934. *Paramichellia baillonii* (Pierre) Hu in Sunyastenin 4 : 142. 1940 ; Balakr., Fl. Jowai 1 : 59. 1981.

Trees, ca 25 m. Flowers pale white, axillary, solitary. Fruits follicles, woody, hooked.

Fl. & Fr. : April - October.

Salt lick forest, Miao, 81157.

*Distrib.* : INDIA : North - east India.

## SCHISANDRACEAE

**Kadsura heteroclita** (Roxb.) Craib, Fl. Siam. Enum, 1 : 28. 1925 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 63. 1985. *Ovaria heteroclita* Roxb., Fl. Ind. 2 : 663. 1832. *Kadsura roxburghiana* Arn. in Mag. Zool. Bot. 2 : 546. 1838 ; Hook. f. & Thomson in Fl. Brit. India 1 : 45. 1872. *K. wattii* C.B. Clarke in J. Linn. Soc. Bot. 25 : 4. 1889.

Large woody climbers, branches dark brown. Leaves leathery. Flowers green turning yellow. Fruits globular.

*Fl. & Fr.* : August - December.

Dehan to Hornbill, 83676.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, BANGLA DESH.

## ANNONACEAE

**Desmos dumosus** (Roxb.) Safford in Bull. Torrey Bot. Club, 39 : 506. 1912 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 67. 1985. *Unona dumosa* Roxb., Fl. Ind. 2 : 670. 1832 ; Hook. f. & Thomson in Fl. Brit. India 1 : 59. 1872.

Climbing or straggling shrubs ; bark dark or greyish brown. Flowers extra - axillary, up to 15 cm long, green or greenish yellow.

*Fl. & Fr.* : May - December.

Miao Bum forest, 81069.

*Distrib.* : INDIA, North - east India ; MALAYA.

**Fissistigma polyanthum** (Hook. f. & Thomson) Merr. in Philipp. J. Sci. Bot. 15 : 135. 1919 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 69. 1985. *Melodorum polyanthum* Hook. f. & Thomson, Fl. Ind. 121, 1855 & in Fl. Brit. India 1 : 81. 1872.

*Mik.* : *Karle phingnu*.

Woody climbers ; bark dark brown, lenticellate. Flowers in cymes, ca 0.7 cm across, pale orange, fragrant.

*Fl. & Fr.* : December - June.

Miao forest, 81158 ; 10th mile, M. V. road, 87762.

*Distrib.* : INDIA : North - east India ; BANGLA DESH, MYANMAR.

**Fissistigma wallichii** (Hook. f. & Thomson) Merr. in Philipp. J. Sci. Bot. 15 : 137. 1919 ; Balakr., Fl. Jowai 1 : 65. 1981. *Melodorum wallichii* Hook. f. & Thomson, Fl. Ind. 118. 1855 & in Fl. Brit. India 1 : 81. 1872.

Woody climber ; young shoots brownish pubescent. Flowers 1-5 fascicles, in terminal or leaf opposed umbels.

*Fl. & Fr.* : January - December.

Miao Bum forest, 79171.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

**Goniothalamus sesquipedalis** (Wallich) Hook. f. & Thomson, Fl. Ind. 108. 1855 & in Fl. Brit. India 1 : 73. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 37. 1934. *Guatteria sesquipedalis* Wallich, Pl. Asiat. Rar. 3, t. 266. 1832.

Sparingly branched, erect undershrubs, 1 - 2 m high ; bark blackish brown. Flowers solitary or in fascicles, axillary or supraxillary, greenish yellow. Fruits orange red.

*Fl. & Fr.* : May - December.

Deban forest, 83657 ; On the way to Bulbulia, 99570.

*Distrib.* : INDIA : North east India ; MYANMAR.

**Griffithianthus fuscus** Merr. in Philipp. J. Sci. 231, 1915. *Griffithia fusca* Maingrey ex King.

Large tree with spreading branches. Flowers dull yellowish green, turning to yellowish. Fruits aggregate, globose, velvate hairy.

*Fl. & Fr.* : March - August.

M' Pen check gate, 81005.

*Distrib.* : INDIA : North east India ; MYANMAR, SRI LANKA, MALAYSIA.

**Milusa globosa** (DC.) Panigr. & S.C. Mishra in Taxon 33 : 713. 1984. *Guatteria globosa* DC. in Mem. Soc. Phys. Hist. Natur. Genevre 5 : 41 (43). 1831 & Period. edit. : 218. 1832. *Hyalostemnia roxburghii* Wallich, cat. no. 6434. 1832, nom. illeg. *Milliusa roxburghiana* (Wallich) Hook. f. & Thomson, Fl. Ind. 150. 1855 & Fl. Brit. India 1 : 87. 1872 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 73 - 74. 1985.

*Asm.* : Bon ponial, Chag ladoi, Jora Bhanora.

Erect shrubs or small trees, 3-12 m high; bark greyish brown, smooth, lenticellate. Flowers axillary, solitary or in fascicle, red, generally drooping.

*Fl. & Fr.* : April-December.

Salt lick forest, 81039; Nampong forest, 81214; Zero point, 84919; 10 km, M.V. road, 87768.

*Distrib.* : INDIA : North-east India; BANGLA DESH, MYANMAR.

*Polyalthia jenkinsii* (Hook. f. & Thomson) Hook. f. & Thomson in Fl. Brit. India 1 : 64. 1872. *Guatteria jenkinsii* Hook. f. & Thomson, Fl. Ind. 141. 1855.

*Asm.* : *Koliori, Tita hachi, Kola khamtou, Kodi.*

Evergreen tree. Flowers large spreading; young fruits green.

*Fl. & Fr.* : April-October.

Noa-Dihing river near Deban, 84940.

*Distrib.* : INDIA : North-east region, Andaman & Nicobar Island; BANGLA DESH, SUMATRA.

*Trivalvaria argentea* (Hook. f. & Thomson) Sinclair in Sarawak Mus. J. 5 : 603. 1951; Balakr., Fl. Jowai 1 : 64. 1981. *Polyalthia argentea* Hook. f. & Thomson in Fl. Brit. India 1 : 67. 1872. *Popowia hookeri* King in J. Asiat. Soc. Beng. 61 (2) : 97. 1892.

Shrubs, ca 3 m high; young branches puberulous. Flowers 1-3 cm, supra-axillary, woody, tubercles, 4-5 mm across, pale yellow green.

*Fl. & Fr.* : March-December.

Deban forest, 83516 & 83592.

*Distrib.* : INDIA : North-east India; BANGLA DESH.

#### MENISPERMACEAE

*Cissampelos pareira* L. var. *hirsuta* (Buch. Ham. ex DC.) Forman in Kew Bull. 22 : 356. 1968. *C. hirsuta* Buch. Ham. ex DC., Syst. Nat. 1 : 535. 1817. *Cissampelos pareira* L., Sp. Pl. 1031. 1753, p.p.; Hook. f. & Thomson in Fl. Brit. India 1 : 103. 1872; Haridasan & Rao, For. Fl. Meghalaya 1 : 78. 1985.

*Asm.* : *Tabuki lot, Tubuki lot*; *Nep.* : *Baral panrhe.*

Twinning shrubs, young parts tomentose or pubescent. Flowers yellow or greenish yellow. Fruits a drupe, deep red in colour.

*Fl. & Fr.* : August - January.

Deban forest, 84988 ; Gandhigram, 99612.

*Distrib.* : INDIA : Throughout India ; Tropics of the World.

**Cyclea bicristata** (Griffith.) Diels in Engler Pflanzener 46 : 317. f. 93. A-E. 1910 ; Balakr., Fl. Jowai 1 : 68. 1981. *Lophophyllum bicristatum* Griffith, Notul. 4 : 313. 1854 ; Hook. f. & Thomson in Fl. Brit. India 1 : 105. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 53. 1934.

Large climbers. Leaves 6 - 15 x 5 - 10 cm, ovate, lanceolate, ovate deltoid, truncate or sub cordate at base, acuminate. Flowers small, yellowish green, in 5 - 8 cm long panicles. Drupes ca 8 mm in diam., orbicular, compressed.

*Fl. & Fr.* : April - October.

Miao to Deban road, 96381.

*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN.

**Haematocarpus validus** (Miers) Bakh. f. ex. Forman in Kew Bull. 26 : 420. 1972. *Baterium validum* Miers in Ann. Mag. Nat. Hist. Ser. 3, 13 : 124. 1864. *Haematocarpus thomsonii* Miers l.c. 3, 19 : 197. 1867 ; Hook. f. & Thomson in Fl. Brit. India 1 : 106. 1872.

Asm. : Inramji - dulela.

Large climbers. Leaves 7 - 10 x 3 - 5 cm, oblong, acute or obtuse at base, acuminate. Flowers in supra axillary racemes, solitary or more, small. Fruits round, green.

*Fl. & Fr.* : April - October.

29th Mile, M.V. road, 86610.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya, Andaman & Nicobar Island ; BANGLA DESH, SUMATRA, JAVA, BORNEO.

**Parabaena sagittata** Miers in Ann. Nat. Hist. Ser. 2, 7 : 39. 1851 ; Hook. f. & Thomson, Fl. Ind. 181. 1855 & in Fl. Brit. India 1 : 96. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 58. 1934.

Large climbers. Leaves ovate, cordate or sagitate at base, shortly acuminate. Flowers in supra axillary cymes, drooping ; petals 3 lobed. Fruits saffron coloured at ripe.

*Fl. & Fr.* : May - November.

*Distrib.* : INDIA : West Bengal, Sikkim, North - eastern India, Arunachal Pradesh, Meghalaya, Andhra Pradesh ; NEPAL, BHUTAN, BANGLA DESH.

*Pericampylus glaucus* (Lam.) Merr., Interpr. Rumph. Herb. Amboin 219. 1917 ; Balakr., Fl. Jowai 1 : 68. 1981. *Menispermum glaucum* Lam., Encycl. Meth. 4 : 100. 1797. *Cocculus incanus* Colebr. in Trans. Linn. Soc. Lond. 13 : 57. t. 32. 1822. *Pericampylus incanus* (Colebr.) Miers in Ann. Nat. Hist. Ser. 2, 7 : 40. 1851 ; Hook. f. & Thomson in Fl. Brit. India 1 : 102. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 52. 1934.

*Asm.* : *Goria loti*.

Climbing shrubs young parts tomentose. Flowers in axillary paniculate cymes, solitary or in fascicles, minute, greenish.

*Fl. & Fr.* : April - October.

27th mile, M.V. road, 87876.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim & North east India ; CHINA, MALAYA, JAPAN.

*Stephania japonica* (Thunb.) Miers var. *discolor* (Blume) Forman in Kew Bull. 11 : 56. 1956. *Clypea discolor* Blume, Bijdr. 26. 1825. *Cissampelos hernandifolia* Willd., Sp. Pl. 4 : 861. 1805. *Stephania hernandifolia* (Willd.) Walp., Repert. 1 : 96. 1842 ; Hook. f. & Thomson in Fl. Brit. India 1 : 103. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 51. 1934.

*Asm.* : *Tubukt loti*.

Climbers with striate stem. Leaves peltate, ovate - deltoid, acuminate. Flowers minute, in axillary pedunculate umbels, yellow. Fruits drupe, globose, red.

*Fl. & Fr.* : March - September.

Deban forest, 81051 & 84925 ; Lohit valley, 87954.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, THAILAND, INDO CHINA, MALAYSIA, AUSTRALIA.

#### LARDIZABALACEAE

*Holboellia latifolia* Wallich, Tent. Fl. Nep. 24. t. 16. 1824 ; Hook. f. & Thomson in Fl. Brit. India 1 : 108. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 61. 1934.



Woody climbers. Leaves alternate, digitately 3-5 rarely 7 foliolate; leaflets 3-12 x 1-5 cm, elliptic-ovate, to lanceolate, or elliptic-oblong, acute to rounded at base, acute to acuminate. Flowers ca 1 cm across, fragrant, green to purplish-green, in axillary fascicles or racemes. Berries pyriform, 8-12 cm long, many seeded.

*Fl. & Fr.* : March - October.

Gandhigram, 99668.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North-east India; NEPAL, MYANMAR, CHINA.

**Paravatia elliptica** (Hemsley) Nayar & T.K. Paul in Fasc. Fl. India 19 : 32. 1988. *Stauntonia elliptica* Hemsley in Hook. Icon. Pl. t. 2844.1907; Kanjilal *et. al.*, Fl. Assam 1 : 60. 1934.

Large woody climbers branchlets striate. Leaves 4-10 x 2-5 cm, ovate-elliptic, apex acute or rounded. Flowers fascicled in racemes, greenish-yellow; stamens 6, white.

*Fl. & Fr.* : August - October (Fruits mature next year).

Left bank of Deban river, 85111.

*Distrib.* : INDIA : Arunachal Pradesh.

### BRASSICACEAE

**Brassica rapa** L. subsp. **campestris** (L.) Claphan in Fl. Brit. Isles ed. 2 : 124. 1962. *Brassica campestris* L., Sp. Pl. 666, 1753; Hook. f. & T. Anderson in Fl. Brit. India 1 : 156. 1872.

Annual herbs, under cultivation. Flowers yellow.

*Fl. & Fr.* : February - April.

Happy valley, 83766.

*Distrib.* : INDIA : Throughout India; NEPAL, BHUTAN.

**Cardamine hirsuta** L., Sp. Pl. 655. 1753; Hook. f. & T. Anderson in Fl. Brit. India 1 : 138. 1872; Balakr., Fl. Jowai 1 : 73. 1981.

Annual decumbent herbs ca 30 cm high. Leaves deeply lobed. Flowers in terminal racemes, white. Pods linear, compressed.

*Fl. & Fr.* : March - June.

23km M.V. road, 83637.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, North east India ; Sub tropics of the World.

### CAPPARACEAE

*Capparis acutifolia* Sw. subsp. *sabiaefolia* (Hook. f. & Thomson) Jacobs in Blumea 12 : 432. 1965. *Capparis sabiaefolia* Hook. f. & Thomson in Fl. Brit. India 1 : 179. 1872. *C. acutifolia* (Sw.) Haridasan & Rao, For. Fl. Meghalaya 1 : 85. 1985.

Asm. : *Keta har.*

Erect shrubs or small trees ca 8 m high. Leaves elliptic to oblong lanceolate, acuminate, with channeled petiole. Flowers in racemes or solitary, 1-1.5 cm across, white. Fruit globose berry.

*Fl. & Fr.* : June - November.

Happy valley area, 83780.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Nagaland, Meghalaya.

*Capparis multiflora* Hook. f. & Thomson in Fl. Brit. India 1: 178. 1872 ; Kanjilal *et. al.*, Fl. Assam 1 : 76. 1934.

Mishm : *Thonim niun.*

Erect bush. Flowers white. Fruit globose, green, hard.

*Fl. & Fr.* : April - December.

Zero camp, 85188 ; East of Gandhigram, 99672.

*Distrib.* : INDIA : Arunachal Pradesh, Assam ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Stixis suaveolens* (Roxb.) Pierre in Bull. Soc. Linn. Paris 1 : 654. 1887 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 87. 1985. *Koydsia suaveolens* Roxb., Corom. Pl. 3, t. 289. 1820 ; Hook. f. & Thomson in Fl. Brit. India 1 : 180. 1872.

Asm. : *Madhabl malati*

Large woody climbers : branchlets white dotted. Flowers 0.8-1.3 cm across, fragrant, white or yellowish white.

*Fl. & Fr.* : February - November.

Noa Dihing south bank, 85021.

*Distrib.* : INDIA : North east India ; MYANMAR, CHINA.

### VIOLACEAE

*Viola diffusa* Ging. ex DC., Prodr. 1 : 298. 1824 ; Hook. f. & Thomson in Fl. Brit. India 1 : 183. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 81. 1934.

Stemless herbs, spreading by stolon ; petiole hairy. Flowers pinkish violet or whitish.

*Fl. & Fr.* : March - June.

Happy valley, 83778 ; Kamlat to Walap, 88005.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, JAPAN, MALAYSIA.

*Viola pilosa* Blume, Cat. Gew. Buit. 57. 1823 ; Hara & Williams in Enum. Fl. Pl. Nepal 2 : 48. 1979. *Viola serpens* Wallich ex. Ging. in DC. Prodr. 1 : 296. 1824 ; Hook. f. & Thomson in Fl. Brit. India 1 : 184. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 81. 1934. *V. palmaris* Buch.- Ham. ex Ging. in DC., Prodr. 1 : 298. 1824.

Perennial herbs, 20 - 40 cm high, with woody root stock. Flowers solitary, ca 1.5 cm across, white pinkish within. Fruits capsule, globose, few seeded.

*Fl. & Fr.* : March - May.

Deban, 79089.

*Distrib.* : INDIA : Kashmir to North - east India ; MYANMAR, THAILAND, CHINA, MALAYSIA, AFGANISTAN.

*Viola sikkimensis* W. Becker in Beih. B. Centralbl. Abf. 2 : 260, 1916 ; Balakr., Fl. Jowai 1 : 76. 1981. *V. hookeri* T. Thomson in Fl. Brit. India 1 : 183. 1872, p.p.

Perennial herbs, ca 20 cm high; root stock woody, Flowers solitary, ca 1.5 cm across, light blue. Fruit capsule ca 8 mm long, elliptic oblong, beaked.

*Fl. & Fr.* : August - October.

22nd mile area, 87860 ; Moti Jheel & Ganga Jheel, 87720.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

## FLACOURTIACEAE

**Gynocardia odorata** R. Br. in Roxb. Pl. Corom. 3 : 95, t. 299. 1819 ; Hook. f. & Thomson in Fl. Brit. India 1 : 195. 1872 ; Bakkr., Fl. Jowai 1 : 78. 1981.

*Asm.* : Chaulmugra, Honsha, Banderpete

Middle sized evergreen trees, ca 20 m high ; bark grey or greyish - brown. Flowers in axillary fascicles or in large branches, pale yellow.

*Fl. & Fr.* : March - January.

Miao forest, 81148 ; Nampong forest, 81215 ; 10th mile forest, 87776 ; 16th mile forest, 851172.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, MYANMAR.

**Hydnocarpus kurzii** (King) Warb. in Pflangen. Fam. III. 6a : 21. 1893 ; Kanjilal *et al.*, Fl. Assam 1 : 87. 1934. *Taractiogenos kurzii* King in J. Asiat. Soc. Beng. 59 (2) : 123. 1890.

*Asm.* : Lamtem ; Chokma ; Dalmergia.

Medium sized trees, up to 20 m high, young parts tawny, pubescent. Flowers in axillary cymes, dioecious, 1 - 1.5 cm across, white or pale yellow.

*Fl. & Fr.* : September - November.

Deban forest, 79042.

*Distrib.* : INDIA : North - east India ; MYANMAR.

## POLYGALACEAE

**Polygala arillata** Buch.-Ham. in D. Don, Prodr. Fl. Nep. 199. 1825 ; Bennett in Fl. Brit. India 1 : 200. 1872 ; Kanjilal *et al.*, Fl. Assam 1 : 97. 1934.

Tall spreading shrubs. Leaves elliptic to oblong, lanceolate, rounded to acute at base, acute at apex. Flowers in terminal axillary or supra - axillary racemes, yellowish. Fruits reniform.

*Fl. & Fr.* : February - October.

34th mile, M.V. road, 86693 ; Hornbili - Firmbase, 83693 ; 40th mile, near Burma nala, 79149 ; On the way to Haldibari, 99418 ; On the way to Vijoyanagar, 99539 ; West of Gandhigram, 99605.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya, Western Ghats ; NEPAL, SRI LANKA, CHINA, MALAYA.

**Polygala tricholopha** Chodat in Mem. Soc. Phys. Geneve, 31. (2) : 98. 1893.

Medium sized trees, ca 15 m tall. Leaves glaucous beneath with wavy margin. Fruits beaked with persistent calyx.

*Fl. & Fr.* : June - October.

M' Pen check gate, 83164.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BHUTAN.

**Salomonina cantoniensis** Lour., Fl. Cochinch. 1 : 41. 1790 ; Bennett. in Fl. Brit. India 1 : 206. 1872. *S. edentula* DC., Prodr. 1 : 334. 1824 ; Bennett in Fl. Brit. India 1 : 207. 1872.

Much branched annual herbs. Flowers in terminal spikes, minute, quite sessile, violet with pink tinge.

*Fl. & Fr.* : September - December.

*Distrib.* : INDIA : North - east India ; NEPAL, MALAYA.

### CARYOPHYLLACEAE

**Drymaria villosa** Cham. & Schlecht. in Linnaea 5 : 232. 1830. subsp. **villosa** Duke in Ann. Miss. Bot. Gard. 48 : 226, f. II, D - E, 1961. *Drymaria stylosa* Baker in Bull. Jard. Bot. Brit. 2 : 15. 1913.

Annual, slender, dichotomously branched herbs, ca 40 cm high. Flowers solitary ca 3 mm across, pale yellow. Fruit a capsule.

*Fl. & Fr.* : October - December.

Firmbase to Bulbulia, 83729.

*Distrib.* : INDIA : North - east India ; NEPAL, MALAYA, AFRICA, AMERICA.

**Stellaria media** (L.) Vill., Hist. Fl. Damph. 3 : 615. 1789., Edgew. & Hook. f., Fl. Brit. India 1 : 230. 1874. *Alsine media* L., Sp. Pl. 272. 1753.

Small herbs, hairy all over. Inflorescence axillary. Flowers small white.

*Fl. & Fr.* : March - July.

17th mile forest, 83754.

*Distrib.* : INDIA : Throughout India ; Cosmopolitan weed.

***Stellaria vestita*** Kurz in J. Bot. 11 : 194, 1873 ; Majumdar in J. Bombay Nat. Hist. Soc. 67 : 27, 1970. *S. saxatilis* Buch. - Ham. ex D. Don, Prodr. Fl. Nep. 215, 1825 ; Edgew. & Hook. f., Fl. Brit. India 1 : 232, 1874. *S. hamiltoniana* var. *vestita* (Kurtz) Majumdar in J. Bombay Nat. Hist. Soc. 53 : 142, 1965.

Climbing herbs. Leaves sessile, ovate elliptic, cordate, acute, tomentose on both surfaces. Flowers in axillary cymes, white. Seeds black.

*Fl. & Fr.* : January - April.

Tutung - Hunung, 87959 ; On the way to Wakro, 99498.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, JAVA, JAPAN, SIBERIA.

### HYPERICACEAE

***Hypericum japonicum*** Thunb. ex Murray, Syst. Veg. ed. 14 : 702 July 1784 ; Thunb., Fl. Jap. 29, t. 31. Aug. 1784 ; Dyer in Fl. Brit. India 1 : 256, 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 102, 1934. *H. laxum* (Blume) Koidzumi in Bot. Mag. Tokyo 40 : 344, 1926 ; Balakr., Fl. Jowai 1 : 86, 1981. *Brathys laxa* Blume, Mus. Bot. Lugd. Bat. 2 : 19, 1856.

Tall herb, branched or unbranched ; stems 4 - angled, hairy. Flowers in terminal and axillary solitary or few flowered dichasial cymes, yellow. Seeds pale brown.

*Fl. & Fr.* : May - October.

Changlang, 14614.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam, Nagaland, Manipur, Meghalaya ; BANGLA DESH, MYANMAR, CHINA, JAPAN, JAVA, AUSTRALIA, AMERICA.

### CLUSIACEAE

***Garcinia acuminata*** Planchon & Triana in Ann. Sci. Nat. Ser. 4, 14 : 355, 1860 ; Maheswari in Bull. Bot. Surv. India 6 : 133, 1964 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 105, 1985.

*Asm.* : *Cau thikera*.

Trees, ca 20 m high ; bark dark brown. Flowers solitary or fasciculate, yellow. Fruit a berry, supported by the persistent sepals.

*Fl. & Fr.* : July - March.

Deban forest, 85093 ; 40th mile I.B. forest, 87688.

*Distrib.* : INDIA : North - east India.

***Garcinia cowa*** Roxb. ex DC., Prodr. 1 : 561, 1824 ; T. Anderson in Fl. Brit. India 1 : 262, 1874, *p.p.* ; Haridasan & Rao, For. Fl. Meghalaya 1 : 106, 1985.

*Asm.* : *Cuithekera, Kangach.*

Medium sized trees, ca 20 m high ; bark brownish orange, rough. Inflorescence terminal or axillary, 1 - flowered or 3 - 5 flowered cymes. Flowers ca 7 mm across, pinkish - yellow.

*Fl. & Fr.* : March - September.

Deban, 85093.

*Distrib.* : INDIA : North - east India ; MALAYA.

*Garcinia tinctoria* (DC.) W.F. Wight in U.S. Deptt. Agr. Bur. Fl. Indus. Bull. 137 : 50. 1909 ; Balakr., Fl. Jowai 1 : 87. 1981. *Xanthochymus tinctorius* DC., Prodr. 1 : 562. 1824.

*Asm.* : *Tepor - tenga.*

Medium sized trees, 10 - 15 m ; branches and branchlets tetragonous. Flowers in fascicles in the axis of fallen leaves, dull white or yellowish.

*Fl. & Fr.* : March - January.

Deban forest, 81054.

*Distrib.* : INDIA : North - east India ; MALAYA.

*Mesua ferrea* L., Sp. Pl. 515. 1753 ; T. Anderson in Fl. Brit. India 1 : 277. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 110. 1985.

*Asm.* : *Nahar* ; *Nokte* ; *Puotrom*

Medium sized trees, 15 - 20 m high ; bark grey or dark brown. Inflorescence terminal, rarely axillary, 1 - 2 flowered. Flowers 5 - 6 cm across, white. Fruits an ovoid capsule.

*Fl. & Fr.* : April - October.

Miao forest, 87984.

*Distrib.* : INDIA : North - east India, Western Ghats, Andaman & Nicobar Islands ; SRI LANKA, MALAYA.

### THEACEAE

*Camellia caudata* Wallich, Pl. Asiat. Rar. 3 : 36. 1832 ; Dyer in Fl. Brit. India 1 : 293. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 122. 1934.

*Asm.* : *Cha, Phulkat.*

Shrubs or small trees, 2 - 5 m. Flowers axillary, solitary or 2 - 5 together in fascicles, white. Fruits a globose capsule.

*Fl. & Fr.* : September - March.

Deban forest, 84927, 86601, 88292 ; 40th mile I.B., 87683.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR, CHINA.

**Eurya acuminata** DC., Mem. Ternstr. 26. 1822 ; Dyer in Fl. Brit. India 1 : 285. 1874 ; Balakr., Fl. Jowai 1 : 93. 1981.

Asm. : *Maymura*.

Shrubs or small trees, bark dark brown ; branchlet terete, pubescent. Flowers in fascicle of 3 - 5, white with foetid smell.

*Fl. & Fr.* : July - February.

Imbeong, 87602 ; Kursiang, 87949 ; Krosam, 88029 ; Glao lake, 99478 ; On the way to 40th mile, 99584.

*Distrib.* : INDIA ; Uttar Pradesh, North - east & South India ; NEPAL, BHUTAN, BANGLA DESH, SRI LANKA, MYANMAR, JAVA, SUMATRA.

**Eurya nitida** Korth. in Temminck, Verh. Nat. Gesch. Ned. Bezitt. Bot. 4 : 115, t. 17. 1841. *E. japonica* Thunb. var. *thunbergii* Thwaites, Enum. Fl. Zeyl. 41. 1828. *E. japonica* Thunb. var. *nitida* (Korth.) Dyer in Fl. Brit. India 1 : 284. 1874.

Evergreen, small spreading trees, 3-8 m tall. Leaves 2 - 7 x 1 - 3 cm, narrowly elliptic, to oblanceolate, cuneate to acute at base, obtuse or acute at apex. Flowers white or greenish - white, 2 or more in axillary fascicles.

*Fl. & Fr.* : February - November.

Gandhigram, 99640.

*Distrib.* : INDIA : Uttar Pradesh, North-east & south India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

**Schima wallichii** (DC.) Korth., Bijdr. Ternstr. in Temmick. Verh. Nat. Gesch. Ned. Bezitt. Bot. 143. 1840 ; Dyer in Fl. Brit. India 1 : 289. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 120. 1895. *Gordonia wallichii* DC., Prodr. 1 : 528. 1824.

Asm. : *Makrisal, Noga - bhe*.

Large trees, 25 - 30 m high, bark blackish brown, young parts villous or pubescent. Flowers axillary, solitary, ca 4 cm across, white. Fruits a capsule.

*Fl. & Fr.* : February - April (Jan. Feb. following year).

*Distrib.* : INDIA ; North - east India ; NEPAL, BHUTAN, BANGLA DESH.

### SAURAUACEAE

**Saurauia cerea** Griffith ex Dyer in Fl. Brit. India 1 : 288. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 123. 1985.

Asm. : *Porhotia hengunia*.



Medium sized trees, ca 15 m high, bark greyish brown. Flowers in fascicled, axillary or in fallen leaves, dark - red at base.

*Fl. & Fr.* : May - October.

Salt lick forest, Miao, 81064.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MYANMAR.

*Saurauia macrotricha* Kurz ex Dyer in Fl. Brit. India 1 : 287. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 124. 1985.

Small trees, 10 - 15 m high, branchlets densely covered with brown to blackish scales. Flowers in fascicles on fallen leaf axil, cream coloured or white.

*Fl. & Fr.* : May - September.

Miao forest, 81141.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Saurauia napaulensis* DC. in Mem. Soc. Phys. Genev. 1 : 421. 1822 ; Dyer in Fl. Brit. India 1 : 286. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 124. 1985.

*Asm.* : *Argangma shing*.

Small trees, 10 - 15 m high, bark reddish brown, young parts scaly. Flowers in lax, axillary, long panicles, white with red tinge. Fruits berry, ovoid or sub - globose.

*Fl. & Fr.* : December - June.

19 - 20th mile, M.V. road, 79098 ;

27th mile forest, 84979, 99552 & 99556.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Saurauia punduana* Wallich, Pl. Asiat. Rar, 2 : 40. 1831 ; Dyer in Fl. Brit. India 1 : 287. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 125. 1985.

*Nep.* : *Rato gagon*.

Small trees, bark brownish grey, corky. Flowers in axillary, fascicled, rarely solitary, pedunculate cymes, white or pale pink.

*Fl. & Fr.* : April - December.

Firmbase, 83713 ; Deban, 81107 & 87617.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Saurauia roxburghii* Wallich, Pl. Asiat. Rar. 2 : 40. 1830 ; Dyer in Fl. Brit. India 1 : 287. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 128. 1934 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 126. 1985.

*Asm.* : *Monposala, Paniposola, Henguina.*

Shrubs or small trees, 8 - 12 m high ; bark greenish grey young fruits scaly. Flowers in axillary, fascicled tomentose, short peduncled cymes, pale - pink. Fruits a globose berry.

*Fl. & Fr.* : March - October.

19th km point, 79102 & 79193 ; 22 - 33 km forest, 83610, 83627 ; Deban 79193 ; On the way to Haldibari, 99428.

*Distrib.* : INDIA : North - east India ; NEPAL., BANGLA DESH, MYANMAR.

#### DIPTEROCARPACEAE

*Dipterocarpus retusus* Blume, Cat. 77. 1823 ; Ashton, Fl. Malesiana 9 (2) : 308. 1982. *D. macrocarpus* Vesque in Compt. Rend. 78 : 627. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 132. 1934.

*Asm.* : *Hollong.*

Tall trees, ca 50 m high with spherical crown ; bark pale bluish grey, plain or slightly warted, young parts, stellately hairy. Flowers axillary, solitary, 6 - 8 mm across, pale pink. Fruits a woody nut, 2 winged.

*Fl. & Fr.* : July - September.

19th mile forest, 85163.

*Distrib.* : INDIA : West Bengal, Assam, Arunachal Pradesh Nagaland ; MYANMAR, MALAYA.

*Shorea assamica* Dyer in Fl. Brit. India 1 : 307. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 136. 1934.

*Asm.* : *Makai.*

Tall trees, 30 - 40 m high, crown large ; bark reddish, brown - young parts puberulous. Flowers in axillary and terminal lax, panicles, 1 - 1.5 cm across, white. Fruit a capsule, ovoid, 5 - winged.

*Fl. & Fr.* : September - December.

10th mile camp, 87755.

*Distrib.* : INDIA : Arunachal Pradesh, Assam.

### MALVACEAE

**Abelmoschus manihot** (L.) Medikus subsp. **tetraphyllus** (Roxb. ex Hornem) Borss. var. **pungens** (Roxb.) Hochr. in *Candollea* 2 : 87. 1924. *Hibiscus pungens* Roxb., *Fl. Ind.* 3 : 213. 1832; Masters in *Fl. Brit. India* 1 : 341. 1874.

Annual or perennial herbs, 3 - 4 m high. Flowers axillary, solitary, 1.0 - 1.2 cm across, yellow with a purple centre. Fruits a capsule, densely hispid berry.

*Fl. & Fr.* : October - November.

M' Pen check gate, 83136.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

**Hibiscus fragrans** Roxb., *Fl. Ind.* 3 : 195. 1832; Masters in *Fl. Brit. India* 1 : 337. 1874 ; Kanjilal *et al.*, *Fl. Assam* 1 : 143. 1934.

*Asm.* : *Pichhola*.

Large woody shrubs. Flowers in terminal axillary panicles, 4-6 cm across, white or light rosy pink. Fruits a capsule, ovoid.

*Fl. & Fr.* : January - March.

Burma nala forest, 87657.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

**Kydia calycina** Roxb., *Pl. Corom.* 3 : 12, t. 218. 1819 ; Masters in *Fl. Brit. India* 1 : 348. 1874 ; Kanjilal *et al.*, *Fl. Assam* 1 : 146. 1934.

Medium sized deciduous trees. Leaves downy pubescent beneath. Flowers in terminal panicles, white.

*Fl. & Fr.* : March - October.

Changlang - Kholā, 20264.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim, Arunachal Pradesh, Assam, Nagaland, Manipur, Meghalaya, Kerala ; MYANMAR.

**Kydia calycina** Roxb. var. **glabrescens** (Masters) Deb, Fl. Tripura 1 : 304. 1981. *Kydia glabrescens* Masters in Fl. Brit. India 1 : 348. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 146. 1934.

Asm. : *Pichtola*.

Tall trees, ca 30 m high. Flowers in terminal or axillary panicles. Fruits a capsule, depressed, globose.

Fl. & Fr. : July - December.

M' Pen check gate, 83156.

Distrib. : INDIA : North - east India ; MYANMAR, MALACCA

**Sida acuta** Burm. f., Fl. Ind. 147. 1768 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 132. 1985. *S. carpinifolia* L. f., Suppl. 31. 1781 ; Masters in Fl. Brit. India 1 : 323. 1874.

Asm. : *Boriala*

Under shrubs, young parts puberulous, Flowers solitary, 1.5 - 2 cm across.

Fl. & Fr. : July - November.

Happy valley, 83764 ; Deban forest, 88610 ; Nampong forest, 88686.

Distrib. : INDIA : Throughout hotter parts of India ; Pantropical.

**Urena lobata** L., Sp. Pl. 692. 1753 ; Masters in Fl. Brit. India 1 : 348. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 137. 1985.

Asm. : *Honborolua, Sokamara*.

Herb to undershrub ca 2 m high. Flowers solitary or in clusters of 2 - 3, ca 2.5 cm across, pink. Fruit a capsule.

Fl. & Fr. : July - February.

Miao forest, 83109 ; Nampong forest, 88687 ; 23rd. km point forest, 83501 ; Miao Salt lick forest, 98165 ; West of Gandhigram, 99608.

Distrib. : INDIA : Throughout India ; Pantropical.

#### STERCULIACEAE

**Abroma augusta** (L.) L.f., Sp. Pl. 341. 1781 ; Masters in Fl. Brit. India 1 : 375. 1974 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 140. 1985. *Thebroma augusta* L., Syst. ed. 12 : 233. 1767.

Asm. : *Gorukhia - korai, Bon - kopahi.*

Erect shrubs ca 3 m high. Flowers leaf - opposed, few flowered cyme, ca 5 cm across, purple. Fruit a capsule, obconical, 5 - winged.

*Fl. & Fr.* : June - November.

Miao forest, 81136 & 83115 ; Happy valley forest area, 83774.

*Distrib.* : INDIA : Throughout India ; CHINA, MALAYA, MALAYSIA

*Sterculia hamiltonii* (Kuntze) Adelb. in Backen Fl. Java, Aufl. 4b., Fam. 107 : 23. 1944 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 149. 1985. *Gompanus hamiltonii* Kuntze, Rev. Gen. 77. 1891. *Sterculia coccinea* Roxb., Fl. Ind. 3 : 151. 1832 non Jack, 1820 ; Masters in Fl. Brit. India 1 : 357. 1874.

Asm. : *Nak - chepeta.*

Tall shrubs or small trees, bark grey. Inflorescence axillary or extra - axillary panicles. Flowers 1.5 - 2 cm across, pink or pinkish - red.

*Fl. & Fr.* : August - March.

Namgoi forest, 88251 ; Salt lick forest Miao, 81047, Nao - Dihing river side, 85068.

*Distrib.* : INDIA : Sikkim, North-east India ; BHUTAN, MYANMAR.

#### BYTTNERIACEAE

*Byttneria grandifolia* DC., Prodr. 1 : 486. (Jan.) 1824 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 141. 1985. *Byttneria aspera* Colebr. ex Wallich in Roxb. Fl. Ind. 2 : 383. (March) 1824 ; Masters in Fl. Brit. India 1 : 377. 1874.

Asm. : *Tikoni - borua.*

Woody climbers, densely tomentose. Flowers in axillary, sub-umbellate cymes, 5-6 cm across, purplish. Fruit a globose, spiny capsule.

*Fl. & Fr.* : May - November.

27th mile forest area, 84986 & 99554.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; BANGLA DESH, CHINA.

## TILLIACEAE

**Columbia floribunda** Wallich ex Kurz in J. Asiat. Soc. Beng. 2 : 63. 1873 ; Masters in Fl. Brit. India 1 : 393. 1874.

Nep. : *Khasra*.

Small deciduous trees up to 15 m high. Flowers small, reddish, yellow, clusters in terminal panicles.

*Fl. & Fr.* : July - October.

Miao forest, 83116.

*Distrib.* : INDIA : North-east India ; MYANMAR.

**Grewia denticulata** Wallich ex Vingt. in Ann. Roy. Bot. Gard. Calc. IX. 10. t. 12 ; Kanjilal *et al.*, Fl. Assam 1 : 167. 1934. *G. nagensium* Prain, J. Asiat. Soc. Beng. 69 (2) : 168.

Much branched spreading shrubs with terete branches. Flowers in axillary cymes 3-5 flowered in each umbell, greenish. Fruit a globose, 3 lobed drupe.

*Fl. & Fr.* : July - December.

40th mile forest, 79179 ; Nampong forest, 81203 ; Deban forest, 85198, 88281 ; Jairamapur forest, 88242.

*Distrib.* : INDIA : North - east India.

**Grewia disperma** Rottb. in Sprengel, Syst. Veg. 2 : 579. 1825 ; Balakr., Fl. Jowai 1 : 104. 1981. *G. multiflora* auct. non Juss. ; Masters in Fl. Brit. India 1 : 388. 1874.

Asm. : *Mon Bijal*.

Shrubs or small trees. Flowers in long cymes, 2 - 4 flowered, yellowish. Fruits black.

*Fl. & Fr.* : July - November.

Miao forest, 83113 ; Deban forest, 85044 ; Krosom to Shirong, 88050 ; 19th mile M.V. road, 99546 ; P. Kund, 99470.

*Distrib.* : INDIA : North east & South. India ; MYANMAR, AUSTRALIA, AFRICA.

**Grewia elastica** Royle, illus. Bot. Himal. 1 : 104. t. 22. 1834 ; Kanjilal *et al.*, Fl. Assam 1 : 103. 1934. *G. asiatica* L., var. *vestita* Masters in Fl. Brit. India 1 : 387. 1874.

Asm. : *Phuhura*.

Trees ; bark greyish - white. Flowers yellow, in fascicles, rarely solitary. Young fruits green, drupes.

*Fl. & Fr.* : April - October

21st km to Deban from Miao, 81116.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India ; PEGU.

*Triumfetta annua* L., Mant. Pl. 1 : 73. 1767 ; Balakr., Fl. Jowai 1 : 103. 1981.

Under shrubs, ca 2 m high. Flowers extra - axillary or leaf opposed fascicles, orange brown.

*Fl. & Fr.* : June - November.

Tulung - Kunung, 87962 ; Nampong forest, 88729.

*Distrib.* : INDIA : Throughout India ; MALAYA, AFRICA.

#### ELAEOCARPACEAE

*Elaeocarpus aristatus* Roxb., Fl. Ind., 2 : 599. 1832 ; Masters in Fl. Brit. India 1 : 405. 1874 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 165. 1985.

Asm. : Nagini.

Trees, ca 40 m high ; bark grey. Flowers in racemes on fallen leaf nodes, dull - white, drooping, fragrant.

*Fl. & Fr.* : April - October.

10th mile forest, 87785 ; 22nd mile point, 87866.

*Distrib.* : INDIA : North - east India ; BANGL DESH, MYANMAR.

*Elaeocarpus lancifolius* Roxb., Fl. Ind. 2 : 598. 1832 ; Balakr., Fl. Jowai 1 : 105. 1981.

Trees, ca 12 m high ; young parts silky pubescent. Flowers in axillary racemes, white.

*Fl. & Fr.* : March - December.

34th mile forest, 87632.

*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN, BANGLA DESH, MYANMAR, JAVA.

**Elaeocarpus sphaericus** (Gaertner) K. Schum. in Engler Pflanzenfam. 3 (6) : 5. 1890 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 167. 1985. *Gajutrus sphaericus* Gaertner, Fruct. 2 : 271, t. 139. 1791. *Elaeocarpus ganitrus* Roxb. ex G. Don, Gen. Syst. 1 : 559. 1831 ; Masters in Fl. Brit. India 1 : 400. 1874.

Asm. : *Rudrai* ; Hindi : *Rudraksha*

Trees, ca 20 m high, generally buttressed at base, bark greenish brown. Flowers in racemes mostly from axils of fallen leaves, nodding, white, Fruits globose drupes.

Fl. & Fr. : May - December.

16th mile forest area, 85180.

Distrib. : INDIA : North - east India ; NEPAL, MALAYA.

**Elaeocarpus tectorius** (Lour.) Poiret in Lam. Encycl. Suppl. 2 : 704. 1812 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 171. 1985. *Craspedum tectorium* Lour., Fl. Cochinch. 256. 1790. *Elaeocarpus robustus* Roxb., Fl. Ind. 2 : 597. 1832 ; Masters in Fl. Brit. India 1 : 402. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 173. 1934.

Asm. : *Poreng - seleng*.

Trees, ca 30 m high ; bark light greenish grey. Flowers axillary, puberulous racemes, 6 - 7 mm across, white, Fruits oblong - ovoid, drupe.

Fl. & Fr. : April - October.

Moti Jheel & Ganga Jheel, 87724.

Distrib. : INDIA : North - east India, Western Ghats ; BANGLA DESH, SRI LANKA, CHINA, MALAYA.

**Sloanea dasycarpa** (Benth.) Hemsl. in Hook. f., IC. Pl. 27. t. 2628. 1910 ; Coode in Kew-Bull 38 : 405. 1983. *Echinocarpus dasycarpus* Benth. in Proc. Linn. Soc. 5. Suppl. 72. 19861 ; Masters in Fl. Brit. India 1 : 400. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 183. 1934.

Asm. : *Bandor Kakoi*.

Large trees, ca 25 m high ; bark greenish brown. Flowers ca 2 cm across, yellowish white. Fruit a capsule with 4 woody valves.

Fl. & Fr. : July - January.

Namgoi, 88253.



*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN.

*Sloanea tomentosa* (Benth.) Rehder & Wilson in Sarg., Pl. Wilson, 2 : 362. 1915. *Echinocarpus tomentosus* Benth. in J. Proc. Linn. Soc. 5 suppl. 2 : 73. 1861 ; Masters in Fl. Brit. India 1 : 400. 1874 ; Kanjilal *et al.*, Fl. Assam 1 : 183. 1934.

Trees, young parts tomentose. Flowers *ca* 1.5 cm across with apiculate anthers. Fruit a capsule, valved, rose - pink in side.

*Fl. & Fr.* : August - December.

Miao forest, 81096.

*Distrib.* : INDIA : Sikkim, North - east India.

### MALPIGHIACEAE

*Aspidepterys indica* (Willd.) Hochr. in Bull. Bot. Btzg. 19 : 45. 1904 ; Balakr., Fl. Jowai 1 : 108. 1981. *Triopteris indica* Willd., Sp. Pl. ed. 4(2) 4 : 744. 1799. *Aspidepterys glabriuscula non A. Juss.* ; Kanjilal *et al.*, Fl. Assam 1 : 189. 1936.

Giant woody climbers. Flowers in axillary and terminal rusty tomentose panicles. Fruits green, 3 winged.

*Fl. & Fr.* : April - December.

Nampong forest, 88751.

*Distrib.* : INDIA : North - east India, Orisa, Western Ghats ; MYANMAR.

### OXALIDACEAE

*Oxalis corniculata* L., Sp. Pl. 435. 1753 ; Edgew. & Hook. f. in Fl. Brit. India 1 : 436. 1874 ; Hara & William, Enum. Fl. Pl. Nepal 2 : 77. 1979 ; Balakr., Fl. Jowai 1 : 109. 1981.

Lesu : *Agachhabo*.

Diffuse, pubescent herbs, with palmately trilobulate leaves. Flowers *ca* 9 mm across, yellow. Fruit a cylindrical capsule.

*Fl. & Fr.* : June - November.

Deban nala left bank, 85104, Tulung-Kunung, 87971 ; Gandhigram, 78705.

*Distrib.* : INDIA : Throughout India ; Cosmopolitan weed.

**Oxalis debilis** H.B.K. var. **corymbosa** (DC.) Lour. in Ann. Miss. Bot. Gard. 67 : 840. 1980. *O. corymbosa* DC., Prodr. 1 : 68. 1824 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 77. 1979.

Annual herbs with small under ground buds. Flowers pink.

*Fl. & Fr.* : April - October.

*Distrib.* : INDIA : Naturalised widely in India ; SOUTH AMERICA.

### BALSAMINACEAE

**Impatiens hracteolata** Hook. f. in Rec. Bot. Surv. India 4 : 31 & 35. 1905 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 4. 1982. *I. angustiflora* var. 2, Hook. f., Fl. Brit. India 1 : 481. 1875.

Small succulent herbs, with angular stem. Flowers many, axillary on long peduncles pink.

*Fl. & Fr.* : July - September.

Pangsu Pass, 81221.

*Distrib.* : INDIA : Endemic. North -east India.

**Impatiens laevigata** Wallich ex Hook. f. & Thomson in J. Linn. Soc. 4 : 146. 1860 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 6. 1982.

Robust much branched herbs. Flowers in dense racemes, yellow with pink streaked. Capsule linear ca 1 cm long.

*Fl. & Fr.* : July - October.

M' Pen Check gate, 81002 ; 32 mile point forest, 87636 ; Miao to Deban, 98169 ; 20th mile, M.V. road, 99547.

*Distrib.* : INDIA : North - east India. Endemic.

**Impatiens latiflora** Hook. f. & Thomson in J. Linn. Soc. 4 : 139. 1860 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 6. 1982.

Succulent herbs. Leaves ciliate at base, elliptic lanceolate, acuminate with persistent bracts. Flowers with very long slender incurved spur.

*Fl. & Fr.* : July - October.

Namong to Pangsu Pass forest, 81102 & 81222.

*Distrib.* : INDIA : North -east India ; BHUTAN.

**Impatiens porrecta** Wallich ex Hook. f. & Thomson in J. Linn. Soc. 4 : 138. 1860 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 6. 1982.

Herbs with creeping stem. Leaves pinkish above. Flowers pale yellow or straw coloured.

*Fl. & Fr.* : July - November.

27th mile, M.V. road, 84946.

*Distrib.* : INDIA : North - east India. Endemic.

**Impatiens racemulosa** Wallich ex Hook. f. & Thomson in J. Linn. Soc. 4 : 145. 1860 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 5. 1982.

Herbs with ovate bracts, glandular at tips. Flowers deep violet with semicircular curved spur. Fruits a clavate capsule.

*Fl. & Fr.* : July - October.

Jairampur to Nampong forest.

*Distrib.* : INDIA : North - east India. Endemic.

**Impatiens tripetala** Roxb. ex DC., Prodr. 1 : 687. 1824 ; Chauhan in J. Meghalaya Sci. Soc. 5 & 6 : 5. 1982.

Erect herbs with swollen stem at nodes. Flowers solitary axillary or fascicled, peduncles long, reddish purple.

*Fl. & Fr.* : August - December.

Deban to Miao, 79035 ; 27th mile camp, 84942.

*Distrib.* : INDIA : Sikkim, North-east India ; BHUTAN.

## RUTACEAE

**Citrus medica** L., Sp. Pl. 782. 1753 ; Hook. f., Fl. Brit. India 1 : 514. 1875 ; Balakr., Fl. Jowai 1 : 116. 1981.

*Asm.* : Jora - tenga.

Tall woody shrubs ; spines straight. Flowers pink or purplish, solitary or in axillary racemes.

*Fl. & Fr.* : January - December.

Deban, 79053 ; on the way to Deban, 79205 ; M' Pen, 81108 ; Noa Dihing South bank, 85017 ; 10th mile, 87798.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North-east India ; MYANMAR, INDO - CHINA.

**Euodia lunu-ankenda** (Gaertner) Merr. in Philip. J. Sci. Bot. 7 : 378. 1912 ; Balakr., Fl. Jowai 1 : 115. 1981. *Fagara lunuankenda* Gaertner, Fruct. 1 : 334. t. 68. f. 9, 1788. *Euodia roxburghiana* Benth. in Fl. Brit. India 1 : 487. 1875.

Medium sized trees. Flowers in axillary or terminal cymes, white. Fruit a globose capsule.

*Fl. & Fr.* : August - March.

Shirong to Hunung, 88099.

*Distrib.* : INDIA : North-east region, South India ; SRI LANKA, SUMATRA, JAVA.

**Euodia trichotoma** (Lour.) Planchon in Piere, Fl. Cochinch. 1. 287. 1893 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 183. 1985. *Tetradium trichotomum* Lour., Fl. Cochinch. 91. 1790.

*Asm.* : Bora - Sing.

Large trees ; crown dense ; bark dark grey. Flowers in large terminal corymbose panicles, greenish - white with reddish disc. Fruits dark red.

*Fl. & Fr.* : May - December.

Near Burma nala, 87663.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, JAVA.

**Glycosmis arborea** (Roxb.) DC., Prodr. 1 : 538. 1824 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 184. 1985. *Limonia arborea* Roxb., Pl. Corom. 1 : 60. t. 85. 1798.

Shrubs or small trees, up to 6 m high. Flowers in axillary panicles, white. Fruits globose, pinkish - white.

*Fl. & Fr.* : Nearly throughout the year.

27th mile forest, 84960.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Glycosmis cyanocarpa** (Blume) Sprengel, Syst. Veg. 11 (Curr. Post.) : 161. 1827 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 82. 1979. *Cookia cyanocarpa* Blume, Bijdr. 136. 1825.

Small trees. Leaves alternate, shining above, green. Inflorescence axillary. Flowers small, white.

*Fl. & Fr.* : February - October.

Deban forest, 83591 ; Firmbase to Bulbulia, 83724 ; 17th mile area, 83753 ; Krosam to Shirong, 88065.

*Distrib.* : INDIA : Sikkim, North - east India, Andaman & Nicobar Islands ; NEPAL, MALAYSIA.

**Glycosmis cymosa** (Kurz) Narayanaswamy in Rec. Bot. Surv. India 14(2) : 26. 1941 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 185. 1985. *Glycosmis cymosa* var. *cymosa* Kurz in J. Bot. 14 : 34. 1876.

Small trees or shrubs ; bark dark brown or greyish - brown. Flowers dull white or yellowish. Young fruits greenish.

*Fl. & Fr.* : February - August.

Deban, 85075 ; Krosam, 88034 ; P. Kund, 99455.

*Distrib.* : INDIA : North - east India.

**Micromelum minutum** (Forst. f.) Wight & Arn., Prodr. 1 : 448. 1834 ; Brink in Blumea 6 : 365. 1950. *Limonia minuta* Forst. f., Fl. Ind. Auster. Prodr. 33. 1784. *Micromelum integerrimum* (Roxb.) Wight & Arn. ex M. Roemer in Fam. Nat. Reg. Veg. 1 : 47. 1846 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 185. 1985. *M. pubescens* non Blume, 1825 ; Hook. f., Fl. Brit. India 1 : 501. 1875. *Bergera integerrima* Roxb., Fl. Ind. ed. 2, 2 : 376. 1832.

Tall shrubs ; bark whitish grey. Flowers fragrant dull white. Fruits ellipsoid, reddish-yellow, usually 1 - seeded.

*Fl. & Fr.* : November - June.

Firmbase, 83706 ; Pangsu Pass forest, 81234.

*Distrib.* : INDIA : North - east India, Andaman & Nicobar Island ; NEPAL, BHUTAN, MYANMAR.

**Murraya paniculata** (L.) Jack. in Malaya Misc. 1 : 31. 1820. *Chalcas paniculata* L., Mant. Pl. 1 : 68. 1767. *Murraya exotica* L., Mant. Pl. 2 : 563. 1771 ; Hook. f., Fl. Brit. India 1 : 502. 1875.

*Asm.* : Kamini.

Shrubs or small trees. Flowers in terminal or axillary cymes, white.

*Fl. & Fr.* : March - December.

10th mile area, 87769 ; Krosam to Shirong, 88053.

*Distrib.* : INDIA : Kashmir, Sikkim, North - east India ; NEPAL, MYANMAR, SRI LANKA, CHINA, MALAYSIA.

**Toddalia asiatica** (L.) Lam., *Encycl. Meth. Bot.* 2 : 116. 1797 ; Balakr., *Fl. Jowai* 1 : 117. 1981. *Paullimia asiatica* L., *Sp. Pl.* 365. 1753. *Toddalia aculeata* Pers., *Syn.* 1 : 249. 1805 ; Hook. f., *Fl. Brit. India* 1 : 497. 1875.

*Asm.* : *Mulkiberdukla*.

Prickly woody shrubs ; young shoots rusty -tomentose. Flowers in axillary or terminal cymes, greenish yellow or white.

*Fl. & Fr.* : December - June.

Deban forest, 79161 ; Gandhigram, 99610.

*Distrib.* : INDIA : Uttar Pradesh to North east India ; BHUTAN, SUMATRA, JAVA, CHINA, PHILIPPINE ISLANDS.

**Zanthoxylum acanthopodium** DC., *Prodr.* 1 : 727. 1824 ; Hook. f., *Fl. Brit. India* 1 : 493. 1875 ; Babu in *Bull. Bot. Surv. India* 16 : 52. 1977. *Z. acanthopodium* var. *timbor* Hook. f., *Fl. Brit. India* 1 : 493. 1875.

Shrubs or small trees, with dense foliage and pungent aromatic smell, branchlets clothed with dense rusty tomentose. Flowers in panicles.

*Fl. & Fr.* : February - August.

East of Gandhigram, 82396.

*Distrib.* : INDIA : Uttar Pradesh, Bihar, West Bengal, Sikkim, Arunachal Pradesh, Meghalaya ; MYANMAR.

### SIMAROUBACEAE

**Brucea mollis** Wallich ex Kurz in *J. Asiat. Soc. Beng.* 42 (2) : 64. 1873 ; Bennet in *Fl. Brit. India* 1 : 530. 1875 ; Kanjilal *et al.*, *Fl. Assam* 1 : 218. 1936.

Shrubs *ca* 2 m high. Leaflets 7 - 13, ovate - oblong to lanceolate, subequal at base, caudate to acuminate. Flowers white or purplish - green, in terminal or axillary panicles. Fruits ovoid, orange - red.

*Fl. & Fr.* : March - December.

P. Kund, 99458 ; Gandhigram, 99617.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, THAILAND, INDO - CHINA, PHILIPPINES.

**Picrasma javanica** Blume, *Bijdr.* 248. 1825 ; Bennet in *Fl. Brit. India* 1 : 520. 1875 ; Kanjilal *et al.*, *Fl. Assam* 1 : 217. 1936. *P. nepalensis* Bennet, *Pl. Jav. Rar.* 201. 1844 ; & 520. 1875 ; Kanjilal *l.c.* 218. 1936.

Trees up to 15 m high. Leaves 12 - 30 cm long ; leaflets usually 7, oblong - lanceolate, 4 - 11 x 1 - 4 cm, elliptic - oblong or elliptic, cuneate at base, caudate - acuminate. Flowers ca 1 cm across, greenish - white, in axillary corymbose panicles, Drupletes 4, globose or obovoid, black.

*Fl. & Fr.* : April - October.

P. Kund, 96360.

*Distrib.* : INDIA : North east India, Andamans ; South east ASIA, PHILIPPINES.

### BURSERACEAE

**Canarium strictum** Roxb., Fl. Ind. 3 : 138. 1832 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 200. 1985. *C. resineferum* Bruce ex King in J. Asiat. Soc. Beng. 62 : 2. 188. t. 13. 1893 ; Kanjilal *et al.*, Fl. Assam 1 : 224. 1934.

Tall resinous trees, ca 40 m high, buttressed at base, bark light greenish grey. Flowers brownish yellow. Fruits ellipsoidal drupe.

*Fl. & Fr.* : June - February.

*Distrib.* : INDIA : North - east India, Western Ghats.

### MELIACEAE

**Aphanamixis chittagonga** (Miq.) Haridasan & Rao, For. Fl. Meghalaya 1 : 204. 1985. *Aglala chittagonga* Miq., Ann. Mus. Bot. Lugd. Bat. 4. 44. 1864

*Asm.* : *Gan - changne*.

Small trees, bark greyish brown. Flowers in long panicles, yellowish - white.

*Fl. & Fr.* : August - March.

29th mile forest, 86632.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MALAYA.

**Aglala edulis** A. Gray in Bot. 4. 5. Explor. Exped. 1 : 237. 1856 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 203. 1985.

Lofty trees, ca 20 m high ; bark greyish - brown. Flowers minute, yellow in rusty tomentose panicles. Fruits light brown coloured, pulpy, edible.

*Fl. & Fr.* : August - March.

Jairampur forest, 88235.

*Distrib.* : INDIA : North - east India ; BANGLA DESH, BORNEO, FIJI ISLANDS.

**Aphanamixis polystachya** (Wallich) Parker in Indian For. 57 : 486. 1931 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 205. 1985. *Aglaia polystachya* Wallich in Roxb., Fl. Ind. 2 : 429. 1824.

Asm. : *Amari, Boga - amari.*

Trees, ca 10 m high, with spreading crown. Flowers in large panicles, dull white, sessile or sub - sessile, polygamous. Capsule ca 2.5 cm across, yellow when ripe. Seeds with red aril and black testa.

*Fl. & Fr.* : October - March.

Deban, 79156 ; Deban to Miao, 79045 ;

Firmbase, 83718. P. Kund, 99472 ; Pakhen to Miao, 99521.

*Distrib.* : INDIA : Throughout India ; MALAYA.

**Chisocheton cumingianus** (C. DC.) Harms subsp. *balansae* (C. DC.) Mabberley. in Taxon 26 : 528. 1977. *C. balansae* C. DC. in Bull. Herb. Boiss. 2 : 578. 1894. *Gaurea paniculata* Roxb., Fl. Ind. 2 : 242. 1832. *Chisocheton paniculatus* (Roxb.) Hiern in Fl. Brit. India 1 : 552. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 207. 1985.

Asm. : *Banderdima.*

Medium sized trees ; young parts brownish hairy. Flowers in lax axillary panicles, pale - yellow.

*Fl. & Fr.* : February - April.

Firmbase, 83719.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Dysoxylum binectariferum** Hook. f. & Beddome in Trans. Linn. Soc. Lond. 25 : 212. 1866 ; Hiern in Fl. Brit. India 1 : 546. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 208. 1985.

Asm. : *Banderdima.*

Trees, up to 20 m high. Panicles 20 - 30 cm. Flowers pale white. Fruit a capsule, pale yellow to orange. Seeds purple.



*Fl. & Fr.* : March - January.

Happy valley, 83787.

*Distrib.* : INDIA : Throughout India ; SRI LANKA.

*Dysoxylum gobara* (Buch. - Ham.) Merr. in J. Arn. Arb. 23 : 17. 1942 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 209. 1985. *Gaurea gobara* Buch. - Ham. in Tran. Wern. Soc. 6 : 306. f. 1. 1832.

Trees, 15 - 20 m high. Flowers in axillary panicles or an old wood, fragrant, creamy - white.

*Fl. & Fr.* : December - August.

25th mile forest, 87903 ; Namgoi forest, 88263 ; Deban, 79250.

Glao lake, 99476 ; Haldibari, 99420.

*Distrib.* : INDIA : North east India ; MYANMAR.

*Dysoxylum pallens* Hiern in Fl. Brit. India 1 : 540. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 233. 1934.

Asm. : *Banderdima*

Trees with a spreading crown. Leaves alternate, dark green, smooth. Flowers greenish white, sweet scented, in spike like long racemes.

*Fl. & Fr.* : February August.

32 km point from Miao, 83608 ; South bank of Noa - Dihing river, 85008.

*Distrib.* : INDIA : Sikkim, North - east India.

*Dysoxylum reticulatum* King, J. Asiat. Soc. Beng. 65 (2) : 114. 1879 ; Kanjilal *et al.*, Fl. Assam 1 : 238. 1934.

Asm. : *Banderdima*

Medium sized trees, ca 30 m tall ; bark grey and warty outside. Flowers in racemes, tetramerous. Fruit a capsule.

*Fl. & Fr.* : March - May.

Zero camp area forest, 84908.

*Distrib.* : INDIA : North - east India.

*Melia superba* Roxb., Hort. Beng. 33 & Fl. Ind. 2 : 397. 1824 ; Kanjilal *et al.*, Fl. Assam 1 : 229. 1936.

Climbing shrubs with axillary tendrils ; tendrils shortly bifid. Flowers dichotomous bracteate, paniculate, axillary cymes, white or pinkish. Fruit a drupe, yellowish red.

*Fl. & Fr.* : May - October.

17th mile forest area, 83748.

*Distrib.* : INDIA : North - east India ; PEGU, MALAYA, JAVA.

*Toona ciliata* Roem., Syn. Hesper. 139. 1846 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 212. 1985. *Cedrela toona* Roxb. ex Rottle., Ges. Natur. F. Freunde Berlin News Schrifter 2 : 198. 1803 ; Hiern in Fl. Brit. India 1 : 568. 1875.

*Asm.* : *Poma Jatipoma*

Lofty trees, ca 40 m high ; bark dark brown, rough scaly, peeling off in irregular flakes. Flowers in large panicles. white.

*Fl. & Fr.* : November - September.

20 km from M' Pen 83194 ; Deban, 84998.

*Distrib.* : INDIA : Througout India ; MALAYA, AUSTRALIA.

### OLACACEAE

*Erythopalum scandens* Blume, Bijdr. 921. 1826 ; Masters in Fl. Brit. India 1 : 578. 1875 ; Balakr., Fl. Jowai 1 : 125. 1981.

Climbing shrubs with axillary tendrils ; tendrils shortly bifid. Flowers dichotomous bracteate, paniculate, axillary cymes, white or pinkish. Fruit a drupe, yellowish red.

*Fl. & Fr.* : May - October.

17th mile forest area, 83748.

*Distrib.* : INDIA : North - east India ; PEGU, MALAYA, JAVA.

*Erythopalum vagum* (Griffith) Masters in Hook. f., Fl. Brit. India 1 : 578. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 248. 1938. *Modeccopsis voga* Griffith, Notul. 4 : 633. 1854.

Climbers with white stem. inflorescence long, laxly branched. Flowers greenish - white.

*Fl. & Fr.* : May - December.

Pangsu Pass forest, 81236.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, MALAYA.

***Olex acuminata*** Benth. in Trans. Linn. Soc. 18 : 678. 1841 ; Masters in Fl. Brit. India 1 : 576. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 216. 1985.

Small trees or shrubs up to 10 m high ; bark brownish. Flowers 3 - 4 mm across, greenish yellow.

Zero area, 84913 ; Deban, 84989

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

***Schoepfia fragrans*** Wallich in Roxb. Fl. Ind. 2 : 188. 1824 ; Masters in Fl. Brit. India 1 : 581. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 249. 1936.

Tall shrubs or small trees up to 5 m tall. Leaves 5 - 8 x 1 - 3 cm, ovate - lanceolate, cuneate at base, acuminate. Flowers *ca* 1.2 cm long, greenish - yellow, in long racemes. Drupes ellipsoid, 1 - seeded.

*Fl. & Fr.* : August - February.

P. Kund, 99464.

*Distrib.* : INDIA : West Bengal, Sikkim, North - east India ; NEPAL, MYANMAR, THAILAND, INDO - CHINA, SUMATRA.

### OPILIACEAE

***Lepionurus sylvestris*** Blume, Bijdr. 1148. 1826 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 217. 1985. *L. oblongifolius* (Griffith) Masters in Fl. Brit. India 1 : 583. 1875.

Large shrub or small trees ; bark grey, rough, often warty. Flowers in axillary or umbellate racemes, greenish. Fruits a ellipsoid drupe.

*Fl. & Fr.* : March - January.

Deban, 79030 ; Noa - Dihing river side, 85084.

*Distrib.* : INDIA : North - east India ; MALAYA.

### ICACINACEAE

***Iodes hookeriana*** Baill. in Adansonia 10 : 268. 1872 ; Masters in Fl. Brit. India 1 : 596. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 219. 1985. *Mappianthus hookerianus* (Baill.) Sleumer in Blumea 17 : 225. 1969.

Large climbing shrubs. Cyme axillary or extra - axillary. Flowers ca 4 mm across, white.

*Fl. & Fr.* : January - October.

Salt lick forest, Miao, 81045.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Iodes ovalis* Blume, Bijdr., 1 : 30. 1825 ; Masters in Fl. Brit. India 1 : 596. 1875. *I. oblonga* Planchon ex Masters in Fl. Brit. India 1 : 597. 1875.

Climbing shrubs, with axillary tendrils. Flowers in cymes, densely villous. Fruits unripe, green, stony.

*Fl. & Fr.* : December - May.

Krosum & Shirong, 88061.

*Distrib.* : INDIA : Arunachal Pradesh ; JAVA, PHILIPPINE.

*Natsiatum herpeticum* Buch. - Ham. ex. Arn. in Edinberg, New. Philos. J. 16 : 314. 1834 ; Masters in Fl. Brit. India 1 : 595. 1875.

Climbing shrubs with tuberous roots. Flowers greenish yellow in supra - axillary hirsute, slender, spiciform racemes.

*Fl. & Fr.* : November - January.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, MYANMAR, CHINA, THAILAND.

### CELASTRACEAE

*Euonymus glaber* Roxb., Fl. Ind. 1 : 628. 1820 ; Lawson in Fl. Brit. India 1 : 609. 1875.

Scandent shrub with smooth shining dark brown bark. Buds young green.

*Fl. & Fr.* : April - October.

40 mile I.B. forest, 87942.

*Distrib.* : INDIA : Arunachal Pradesh.

*Euonymus theifolius* Wallich ex Lawson in Fl. Brit. India 1 : 612. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 231. 1985.

Subscandent shrubs, ca 3 m high. Flowers in axillary or supra axillary cymes, tetramerous, white or greenish - white.

*Fl. & Fr.* : February - April.

Deban forest, 85037.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ;  
BHUTAN.

**Microtropis discolor** (Wallich) Arn. in Ann. Nat. Hist. 3 : 152. 1839 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 232. 1985. *Cassine discolor* Wallich in Roxb., Fl. Ind. 2 : 378. 1824.

Shrubs or small trees, bark brown or dark brown. Flowers in axillary or supra axillary peduncled cymes, pentamerous, greenish white or purplish green.

*Fl. & Fr.* : January - December.

Hornbill, 87702 ; West of 40th mile I.B., 87682 : P. Kund, 999450.

*Distrib.* : INDIA : Sikkim, North east India ; BHUTAN, MYANMAR.

### HIPPOCASTANACEAE

**Aesculus assamica** Griffith, Notul. 4 : 540. 1854 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 232. 1985. *Aesculus punduana* Wallich ex. Hiern in Fl. Brit. India 1 : 675. 1875.

*Asm.* : *Bhish - gach, Raman - bih.*

Medium sized trees up to 15 m high. Flowers 2 - 2.5 cm across, white with yellow throat. Fruit a capsule.

*Fl. & Fr.* : January - August.

Happy valley, 83767 ; 21 km to Deban, 81110 ; Miao forest, 79049.

*Distrib.* : INDIA : North - east India ; MYANMAR, MALAYA.

### RHAMNACEAE

**Gouania tiliaefolia** Lam., Encycl. Meth. Bot. 3 : 5. 1789 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 234. 1985. *Gouania leptostachya* DC., Prodr. 2 : 40. 1825 ; Lawson in Fl. Brit. India 1 : 643. 1875.

*Asm.* : *Jwarpat.*

Woody climbers with circinate tendrils at the ends. Flowers in axillary or terminal, simple or compound racemose spike, greenish yellow.

*Fl. & Fr.* : July - November.

M' Pen check gate forest, 83159.

*Distrib.* : INDIA : North - east India ; MALAYA.

**Rhamnus napalensis** (Wallich) Lawson in Fl. Brit. India 1 : 640. 1875 ; Balakr., Fl. Jowai 1 : 133. 1981. *Ceanothus napalensis* Wallich ex Roxb., Fl. Ind. 2 : 369. 1824.

*Asm.* : *Biringa*.

Large shrubs or small trees. Leaves elliptic or ovate, cuneate at base, acuminate. Flowers in simple or branched racemes, pale white or greenish - yellow. Fruits dark red.

*Fl. & Fr.* : September - March.

27th mile camp area, 84975 ; Deban to Firmbase, 99405.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR.

**Ziziphus mauritiana** Lam., Encycl. Meth. Bot. 3 : 319. 1789 ; Balakr., Fl. Jowai 1 : 134. 1981. *Z. jujuba* Lam., Encycl. Meth. Bot. 3 : 318. 1789 non Miller, 1768 ; Lawson in Fl. Brit. India 1 : 632. 1875.

*Asm.* : *Boguri*.

Small woody trees. Stipules modified into spines. Flowers in sub - sessile, axillary cymes, yellowish - green.

*Fl. & Fr.* : August - February.

Deban forest, 88642.

*Distrib.* : INDIA : Throughout India ; PAKISTAN, SRI LANKA, CHINA, AFRICA, AUSTRALIA.

## VITACEAE

**Cayratia japonica** (Thunb.) Gagnepain in Lecomte Not. Syst. 1 : 349. 1911 ; Balakr., Fl. Jowai 1 : 139. 1981. *Vitis japonica* Thunb., Fl. Jap. 104. 1784. *Vitis tenuifolia* Wight & Arn., Prodr. 129. 1843 ; Lawson in Fl. Brit. India 1 : 660. 1875.

Slender climbers. Flowers in axillary corymbose cymes, ca 3 mm across, green.

*Fl. & Fr.* : April - August.

Krosam, 88032 ; 22 Km to Deban I.B., 35315.

*Distrib.* : INDIA : Sikkim, North east India, Western Ghats ; MYANMAR, CHINA.

*Cayratia pedata* (Lour.) Juss ex Gagnepain in Not. Syst. 1 : 346. 1911 ; Balakr., Fl. Jowai 1 : 139. 1981. *Cissus pedata* Lam., Encycl. Meth. Bot. 1 : 31. 1783. *Vitis pedata* Wallich ex Wight & Arn., Prodr. 128. 1834 ; Lawson in Fl. Brit. India 1 : 661. 1875.

Woody climbers ; stem hirsute. Flowers in cymes, greenish.

*Fl. & Fr.* : April - October.

Rajanagar, 88224.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Cayratia trifolia* (L.) Domin in Bibl. Bot. 89 : 371. 1927. *Vitis trifolia* L., Sp. Pl. 1 : 203. 1753 ; Kanjilal *et al.*, Fl. Assam 1 : 295. 1936. *Vitis carnosia* (Roxb.) Wallich, Cat. 206 no. 6018. 1831 - 1832 ; Lawson in Fl. Brit. India 1 : 654. 1875.

*Asm.* : *Chepeta* - lot.

Climbers with stem angular, hexagonal. Inflorescence leaf opposite or axillary. Flowers small, greenish, Fruits clustered dark, coloured.

*Fl. & Fr.* : August - November.

Salt lick forest, 81170 ; 29th mile forest, 86606.

*Distrib.* : INDIA : Uttar Pradesh, North - east India ; MYANMAR, CHINA, MALAYSIA.

*Cissus assamica* (Lawson) Craib in Kew Bull. 1911 : 31. 1911 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 243. 1985. *Vitis assamica* Lawson in Fl. Brit. India 1 : 648. 1875.

Woody climbers, Flowers ca 5 mm across, greenish - yellow. Fruit a blue or black berry.

*Fl. & Fr.* : July - November.

26th mile forest, 86673.

*Distrib.* : INDIA : North east India.

*Cissus repens* Lam., Encycl. Meth. Bot. 1 : 31. 1783 ; Balakr., Fl. Jowai 1 : 136. 1981. *Vitis repens* (Lam.) Wight & Arn., Prodr. 124. 1834 ; Lawson in Fl. Brit. India 1 : 646. 1875.

*Asm.* : *Medmedia* lot.

Climbers ; young shoot reddish. Leaves simple, cordate. Inflorescence leaf opposed. Flowers greenish - red. Fruit a globose berry.

*Fl. & Fr.* : August - January.

*Distrib.* : INDIA : North - east India ; BANGLA DESH, JAVA, MALAYA.

**Tetrastigma bracteolatum** (Wallich) Planchon in DC., Monogr. Phan. 5 : 428. 1887. *Vitis bracteolata* Wallich in Roxb., Fl. Ind. 2 : 483. 1824 ; Lawson in Fl. Brit. India 1 : 654. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 296. 1936.

Climbers, wiry, glabrous, woody stem. Flowers in corymbose cymes, axillary, whitish. Fruits black.

*Fl. & Fr.* : August - January.

Deban forest, 84928 ; on the way to Imbeong, 87603 ; Pangsua Pass forest, 81233, 88269 ; Haldibari, 99401 ; P. Kund, 99943.

*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN.

**Tetrastigma leucostaphylum** (Dennst.) Alston in Taxon 26 : 539. 1977 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 245. 1985. *Vitis leucostaphylum* Dennst. in Schluess. Hort. Malab. 33. 1818.

*Asm. Tadi - ripam.*

Lianas, stem flat, minutely warty. Flowers in sub corymbose, axillary cymes, pale green.

*Fl. & Fr.* : April - September.

40th mile forest, 79168 ; 20th mile forest, 86678 ; 22 km to Deban I.B., 83535.

*Distrib.* : INDIA : Throughout India ; MALAYA.

**Tetrastigma obovatum** (Lawson) Gagnepain in Not. Syst. 1 : 266. 1911 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 245. 1985. *Vitis obovata* Lawson in Fl. Brit. India 1 : 658. 1875.

Woody climbers, stem flattened. Flowers in corymbose cymes, greenish yellow. Fruits an ellipsoid, black berry.

*Fl. & Fr.* : May - October.

25th mile forest area, 87908.

*Distrib.* : INDIA : North - east India.



**Tetrastigma rumicispermum** (Lawson) Planchon in DC., Monogr. Phan. 5. 429. 1847 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 246. 1985. *Vitis rumicisperma* Lawson in Fl. Brit. India 1 : 661. 1875.

Lianas, stem terete, minutely warty. Flowers in axillary or terminal cymes, pale green.

*Fl. & Fr.* : April - September.

19th mile forest, 85159.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN.

**Tetrastigma serrulatum** (Roxb.) Planchon in DC., Monogr. Phan 5 : 342. 1887 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 246. 1985. *Cissus serrulatus* Roxb., Fl. Ind. 1 : 414. 1820.

Wiry glabrous climbers, with adhesive tendrils. Flowers in axillary terminal cymes, ca 5 mm across, green.

*Fl. & Fr.* : January - December.

Hornbill, 87705 ; Gandhigram, 99649.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR.

**Vitis planicaulis** Hook. f. in Bot. Mag. t. 5685. & Fl. Brit. India 1 : 658. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 298. 1936.

*Asm.* : *Pani Lcota*.

Large climbers ; stem soft much flattened. Flowers in umbels, greenish - yellow.

*Fl. & Fr.* : March - October.

10th mile camp, 87756 ; Deban 85054.

Gandhigram, 99691.

*Distrib.* : INDIA : North - east India. Endemic.

#### LEEACEAE

**Leea compactiflora** Kurz in J. Asiat. Soc. Beng. 42 (2) : 65. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 249. 1985. *Leea trifoliata* Lawson in Fl. Brit. India 1 : 666. 1875. *Leea bracteata* C.B. Clarke in J. Bot. 19 : 164. 1881 ; Kanjilal *et al.*, Fl. Assam 1 : 308. 1936.

Shrubs, often rooting from nodes. Flowers in terminal or subterminal, corymbose cymes, pale yellow. Fruits a globose, black berry.

*Fl. & Fr.* : May - December.

Miao forest, 81015 ; 20 km onwards M'Pen, 83197 ; 21 km Deban, 81113 ; Jairampur forest, 88233.

*Distrib.* : INDIA : Sikkim, North-east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Leea crispa* L., Mant. Pl. 124, 1767 ; Lawson in Fl. Brit. India 1 : 665, 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 249, 1985.

Shrubs, young parts brown tomentose. Flowers in solitary or paired, axillary corymbs, pale - yellow.

*Fl. & Fr.* : June - December.

*Distrib.* : INDIA : Sikkim, North-east India, Western Ghats ; NEPAL, BHUTAN.

*Leea edgeworthii* Santapau in Rec. Bot. Surv. India 16 (1) : 54, 1953 ; Balakr., Fl. Jowai 1 : 140, 1981. *L. aspera* Edgew. in Trans. Linn. Soc. 20 : 36, 1846 non Wallich, 1824 ; Lawson in Fl. Brit. India. 1 : 665, 1875.

Small trees. Leaves opposite, serrate, acute to acuminate. Flowers light green or greenish - white.

*Fl. & Fr.* : May - October.

Deban forest, 83653.

*Distrib.* : INDIA : Throughout India ; MALAYA.

*Leea indica* (Burm. f.) Merr. in Philipp. J. Sci. Bot. 14 : 245, 1919 ; Balakr., Fl. Jowai 1 : 140, 1981. *Staphylea indica* Burm. f., Fl. Ind. 75, t. 24, l. 2, 1788.

Asm. : *Kukura thengia*.

Tall shrubs, main stem thick at base. Flowers in subterminal corymbose, pale green.

*Fl. & Fr.* : June - December.

M'Pen check gate, 83161 ; Deban forest, 85047 ; 40th mile, M.V. road, 99586.

*Distrib.* : INDIA : Throughout India ; MALAYA.

*Leea macrophylla* Roxb. ex Hornem., Hort. Hafn. 1 : 231, 1813 ; Lawson in Fl. Brit. India 1 : 664, 1875 ; Ridsdale in Blumea 22 : 85, 1974.

*L. integrifolia* Roxb., Fl. Ind. 2 : 472. 1824 ; Lawson l.c. 667. *L. robusta* Roxb., Fl. Ind. 2 : 468. 1824. *L. latifolia* Wallich ex Kurz in J. Asiat. Soc. Beng. 44 (2) : 178. 1875.

Shrubs up to 2 m tall. Leaves unifoliolate or 1 - 2 pinnate ; leaflets 20 - 40 x 12 - 35 cm, broad at base, acuminate. Flowers ca 6 mm across, greenish - white, in multi branched cymes. Fruits blackish.

*Fl. & Fr.* : October - April.

Deban, 96364 ; Panikheti, 99520.

*Distrib.* : INDIA : Kumaon, Sikkim, North Bengal, North east India ; NEPAL, BHUTAN, MYANMAR, THAILAND, INDO - CHINA.

### SAPINDACEAE

*Allophylus distachys* (DC.) Radlk. in Engler & Prantl Pflanzenf. 3. 5 : 315. 1895 ; Balakr., Fl. Jowai 1 : 141. 1981. *Schmidelia distachya* DC., Prodr. 1 : 610. 1824. *A. cobbe* Blume, Rumph. 3 : 131. 1847. *A. cobbe* Blume f. *distachys* (DC.) Hiern in Fl. Brit. India 1 : 674. 1875 ; Kanjilal et al., Fl. Assam 1 : 315. 1936.

Shrubs ca 3 m tall. Leaflets 7 - 24 x 3 - 8 cm, elliptic, oblong lanceolate or oblanceolate, cuneate at base, acuminate at apex. Flowers ca 2 mm across, greenish - white, in racemes. Fruit red.

*Fl. & Fr.* : June - December.

Gandhigram, 99648.

*Distrib.* : INDIA : Throughout India ; INDO - MALAYA.

*Lepisanthes erecta* (Thwaites) Leenh. in Blumea 17 : 69. 1967. *Nephalium erectus* Thwaites, Enum. 57. 1858. *Sapindus erectus* (Thwaites) Hiern in Fl. Brit. India 1 : 683. 1875.

Shrubs or small trees. Leaves glossy on both the surfaces. Flowers small. Fruit globose, fleshy, dark - red.

*Fl. & Fr.* : December - April.

*Distrib.* : INDIA : North east India ; SRI LANKA.

*Lepisanthes senegalensis* (Juss. ex Poiret) Leenh. in Blumea 17 : 85. 1969. *Sapindus senegalensis* Juss. ex Poiret, Encycl. 6 : 666. 1805. *Aphania rubra* Radlk. in Sitzb. Math Phys. Acad. Muench. 8 : 238. 1878 ; Kanjilal et al., Fl. Assam 1 : 321. 1939. *Scytalia rubra* Roxb., Fl. Ind. 2 : 272. 1824. *Sapindus attenuatus* Wallich ex Hiern in Fl. Brit. India 1 : 684. 1875.

Asm. : *Tang - ting, Bonderdima.*

Medium sized trees. Leaves paripinnate, crowded at the tips of twigs ; leaflets elliptic to oblong, acuminate, entire. Flowers in panicles, pinkish - yellow. Drupe purple.

*Fl. & Fr.* : February - June.

Krosam to Shirong, 88051.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BANGLA DESH, MYANMAR.

*Nepellium mutabile* Blume, Rumphia 3 : 104. 1847 ; Hiern in Fl. Brit. India 1 : 686. 1875. *N. griffithianum* Kurz in J. Asiat. Soc. Beng. 12 (2) : 303. 1872.

Chakma : *Lesugula.*

Shrubs or small trees. Leaves paripinnate: leaflets 4-8, opposite or sub alternate. Flowers in simple or branched racemes ; petals absent. Fruits 2-3 cm across.

*Fl. & Fr.* : July - February.

23rd mile. 87895 ; Deban road, 79188.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR, MALAYA, BORNEO.

## ACERACEAE

*Acer laevigatum* Wallich, Pl. Asiat. Rat. 2 : 3, t. 104. 1831 ; Hiern in Fl. Brit. India 1 : 693. 1875 ; Kanjilal *et al.*, Fl. Assam 1 : 312. 1936.

Kh. : *Dlening than, Dieng soh tyrkhum* ; Nep. : *Dhalani Kabashi* ; Lep. : *Tungnoyok.*

Small trees. Leaves 3 - 12 x 2 - 4 cm, elliptic - oblong or ovate lanceolate, acute, acuminate. Flowers in subcorymbose, terminal or axillary cymes, white. Fruits with ovoid mericarp.

*Fl. & Fr.* : June - September.

Changlang, 26279.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya.

*Acer oblongum* Wallich ex DC. var. *microcarpum* Hiern in Fl. Brit. India 1 : 693. 1875 ; Nayar & Dutta in Fasc. Fl. India 9 : 12. 1982.

Kh. : *Dieng - soh - Khru* ; Nep. : *Buzimpala*.

Evergreen tall trees, buttressed at base ; bark wrinkled, white and green. Leaves 5 - 12 × 3 - 5 cm, ovate-lanceolate or oblong, minutely reticulate. Flowers greenish - white. Fruits samara ca 1 cm long.

Fl. & Fr. : March - April.

Lati valley, 935.

Distrib. : INDIA : Arunachal Pradesh.

*Acer sikkimense* Miq. var. *serrulatum* Pax in Bot. Jahrb. 7 : 215. 1886 ; Nayar & Dutta in Fasc. Fl. India 9 : 16. 1982.

Lep. : *Palegnyok*.

Trees ; branches green to reddish - brown or grey. Leaves 9 - 17 × 7 - 9 cm, ovate, caudate to cuspidate, margin serrulate. Flowers yellowish - green. Fruits samara ca 1.6 cm long.

Fl. & Fr. : October - April.

Lati valley, 936.

Distrib. : INDIA : Arunachal Pradesh.

### STAPHYLACEAE

*Turpinia nepalensis* Wight & Arn., Prodr. 156. 1834 ; Kanjilal *et al.*, Fl. Assam 1 : 310. 1936.

Small trees or shrubs. Leaves 4 - 10 × 2 - 4 cm, elliptic - lanceolate, cuneate at base, caudate - acuminate. Flowers in axillary panicles, greenish - white. Fruits 3 - seeded.

Fl. & Fr. : May - December.

Jairampur, 26246.

Distrib. : INDIA : Sikkim, North east India, Western Ghats ; NEPAL, BANGLA DESH, MYANMAR, CHINA, MALAYA.

*Turpinia pomifera* (Roxb.) DC., Prodr. 2 : 3. 1825 ; Hiern in Fl. Brit. India 1 : 698. 1875 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 264. 1985. *Dalrympella pomifera* Roxb., Pl. Corom. 3 : 76. t. 279. 1819.

Asm. : *Gobar - Khutla*.

Medium sized trees, ca 15 m high ; bark grey or brown. Flowers in large terminal panicles, yellowish. Fruit a globose nut.

Fl. & Fr. : February - October.

29th mile forest, 86615 ; Salt lick, Miao, 85002 ; Rajnagar, 88226.

*Distrib.* : INDIA : Sikkim, North east India, Western Ghats ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR, SRI LANKA, CHINA.

### SABIACEAE

**Mellosma pinnata** (Roxb.) Walp., Rep. 1 : 432. 1842 ; Hook. f., Fl. Brit. India 2 : 6. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 266. 1985. *Millingtonia pinnata* Roxb., Fl. Ind. 1 : 103. 1820.

Asm. : *Momoi*.

Small trees ; bark greenish or reddish brown, peeling off in papery flakes. Flowers ca 4 mm across, creamy white.

*Fl. & Fr.* : April - October.

25th mile forest area, 87907.

*Distrib.* : INDIA ; Sikkim, North east India, Western Ghats ; BANGLA DESH, MALAYA.

**Meliosma simplicifolia** (Roxb.) Walp., Rep. 1 : 423. 1842 ; Hook. f., Fl. Brit. India 2 : 5. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 266. 1985. *Millingtonia simplicifolia* Roxb., Fl. Corom. t. 254. 1820.

Asm. : *Laru - bandha*.

Medium sized trees, ca 15 m high ; bark greenish - grey. Flowers in axillary or terminal panicles, white or pale yellow.

*Fl. & Fr.* : January - July.

South bank of Noa Dihing, 85025 ; Miao forest, 79019 ; Glao Lake, 99502.

*Distrib.* : INDIA : Sikkim, North east India, Western Ghats ; NEPAL, BANGLA DESH, SRI LANKA, MYANMAR, CHINA, THAILAND.

**Meliosma wallichii** Planchon ex Hook. f., Fl. Brit. India 2 : 6. 1876 ; Kanjilal *et al.*, Fl. Assam 1 : 238. 1936.

Small trees up to 12 m high. Leaves 6 - 13 cm ; leaflets 6 - 15 x 1.5 - 2.8 cm, ovate to oblanceolate, rounded at base, acuminate. Flowers ca 4 mm across, yellowish white, in terminal or axillary panicles. Drupes ca 5 mm across, reddish.

*Fl. & Fr.* : August - February.

Gandhigram, 99690.

*Distrib.* : INDIA : Sikkim, North - east India ; INDO - MALAYA.

*Sabia lanceolata* Colebr. in Trans. Linn. Soc. 12 : 355. t. 14. 1817 ;  
Hook. f., Fl. Brit. India 2 : 2. 1876 ; Haridasan & Rao, For. Fl. Meghalaya  
1 : 269. 1985.

Woody climbing shrubs ; bark blackish or dark brown, smooth.  
Flowers in terminal or axillary panicles, greenish yellow or greenish  
white.

*Fl. & Fr.* : October - March.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

### ANACARDIACEAE

*Drimycarpus racemosus* (Roxb.) Hook. f. in Benth. & Hook. f.,  
Gen. Pl. 1 : 424. 1862 ; Hook. f., Fl. Brit. India 2 : 36. 1876 ;  
Haridasan & Rao, For. Fl. Meghalaya 1 : 271. 1985.

*Asm.* : *Amselenga*.

Tall trees, ca 20 m high, bark dark brown, rough covered with  
spindle - shaped lenticels. Flowers in long panicles, brownish - white.

*Fl. & Fr.* : July - March.

M' Pen check gate, 83138.

*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN, BANGLA  
DESH.

*Mangifera sylvatica* Roxb., Fl. Ind. 1 : 644. 1820 ; Hook. f., Fl.  
Brit. India 2 : 15. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 273.  
1985.

*Asm.* : *Bon - am*.

Tall evergreen trees, with dense crown ; bark brownish grey.  
Flowers in long panicles, brownish white.

*Fl. & Fr.* : June February.

Burma nala, 79167 ; Rima village side, 80279.

*Distrib.* : INDIA : North - east India, Andaman & Nicobar Islands ;  
NEPAL, BANGLA DESH, THAILAND.

*Pegia nitida* Colebr. in Trans. Linn. Soc. 15 : 364. 1827 ; Haridasan  
& Rao, For. Fl. Meghalaya 1 : 274. 1985. *Tapiria hirsuta* (Roxb.) Hook.  
f. in Benth. & Hook. f., Gen. Pl. 1 : 423. 1862 & Hook. f., Fl. Brit. India  
2 : 28. 1876.

Asm. : *Dhindau - Bagurilata*.

Large shrubs ; bark blackish or brownish. Leaves hairy, both surfaces. Flowers in panicles, minute, yellowish or white.

*Fl. & Fr.* : January - June.

12th mile area, 83792.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR.

*Rhus chinensis* Miller, Gard. Dict. (ed. 8) R. No. 7. 1768 ; Joseph, Fl. Nongpoh 76. 1981.

Asm. : *Naga tenga*.

Small trees, with spreading branches. Flowers in terminal panicles, white or yellowish. Drupe pink.

*Fl. & Fr.* : September - March.

Jairampur, 19934.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh.

*Rhus semialata* Murray in Conn. Soc. Sci. Gotting. 6 : 27. t. 3. 1784 ; Hook. f., Fl. Brit. India 2 : 10. 1876 ; Merr. in J. Am. Arb. 9 : 3. 1928 ; Kanjilal *et al.*, Fl. Assam 1 : 331. 1936. *R. javanica* L., Sp. Pl. 1 : 265. 1753 ; Balakr., Fl. Jowai 1 : 147. 1981.

Medium sized trees, ca 12 m high. Leaves compound, dentate. Flowers in paniculate racemes, yellow, greenish - white.

*Fl. & Fr.* : August - March.

Pangsu forest, 88277.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; MALAYA.

*Rhus succedanea* L., Mant. Pl. 2 : 221. 1767 ; Hook. f., Fl. Brit. India 2 : 12. 1876. *Rhus succedanea* L. var. *acuminata* (DC.) Hook. f., Fl. Brit. India 2 : 12. 1876.

Small trees, bark dark grey or greenish brown. Flowers in dropping panicles, yellow.

*Fl. & Fr.* : March - December.

Krosun to Shirong, 88064 ; 16 km on Deban road, 96380.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; MALAYA.



**Spondias pinnata** (L. f.) Kurz, Regn. Rep. 44. 1875 ; Balakr., Fl. Jowai 1 : 146. 1981. *Mangifera pinnata* L.f., Suppl. 156. 1781. *Spondias mangifera* Willd., Sp. Pl. 2 : 751. 1799 ; Hook. f., Fl. Brit. India 2 : 42. 1876.

Asm. : *Amora tenga*.

Tree, bark with vertical streaks. Flowers in long spreading panicles. creamy white or yellow. Fruits edible, drupe.

*Fl. & Fr.* March - November.

Jairampur - Nampang forest, 88262.

*Distrib.* : INDIA : Throughout India ; S.E. ASIA.

### FABACEAE

**Cajanus crassus** (Prain & King) van der Maesen in Agric. Univ. Wayanigen Pap. 84 (4) : 105. 1985. *Atylosia crassus* Prain & King in J. Asiat. Soc. Beng. 66 : 45. 1897. *Atylosia volubilis* (Blanco) Gamble, Fl. Pres. Madras 1 : 369. 1918 ; Babu, Herb. Fl. Dehradun 121. 1977. *A. mollis* Benth. in Miq., Pl. Jungh. 243. 1852, *p.p. excl. Syn. Collaea mollis* Grah ; Baker in Fl. Brit. India 2 : 213. 1876.

Weak climbers, climbing on small trees. Flowers axillary, terminal, violet.

*Fl. & Fr.* : October - January.

On the way to Imbeong, 87611.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east region, Peninsular and Central India, Andamans; NEPAL, MYANMAR, THAILAND, MALAYSIA, VIETNAM.

**Crotalaria albida** Heyne ex Roth, Nov. Pl. Sp. Ind. Or. 333. 1821 ; Baker in Fl. Brit. India 2 : 71. 1876 ; Balakr., Fl. Jowai 1 : 152. 1981.

Erect diffuse herbs, ca 75 cm high. Flowers in terminal racemes ; rachis, densely hairy, 6 - 20 flowered.

*Fl. & Fr.* : July - December.

Deban nala, 85118.

*Distrib.* : INDIA : Throughout in Himalayas up to 2400 m ; PAKISTAN, NEPAL, BHUTAN, TAIWAN.

**Crotalaria mysorensis** Roth, Nov. Pl. Sp. Ind. Or. 338. 1821 ; Baker in Fl. Brit. India 2 : 70. 1876 ; Balakr., Fl. Jowai 1 : 153. 1981.

Diffuse herbs. Flowers in racemes, lax, 3 - 12 flowered, yellow.

*Fl. & Fr.* : July - December.

Deban nala, 85122.

*Distrib.* : INDIA : Throughout in Western Himalayas up to 1350 m, Meghalaya ; PAKISTAN, NEPAL, MALAYSIA.

**Dalbergia assamica** Benth. in Miq., Pl. Jungh. 1 : 225. 1851 ; Baker in Fl. Brit. India 2 : 235. 1876 ; Balakr., Fl. Jowai 1 : 168. 1981.

*Asm.* : Meda - Iuwa.

Trees ca 25 m high. Flowers in axillary panicles, white or purplish blue. Fruit linear oblong pods.

*Fl. & Fr.* : March - January.

Deban forest, 84992.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India.

**Dalbergia pinnata** (Lour.) Prain in Ann. Rec. Bot. Gard. Calc. 10 : 48. 1904 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 287. 1985. *Derris pinnata* Lour., Fl. Cochinch. 432. 1790. *D. tamarindifolia* Roxb., Fl. Ind. 3 : 233. 1832 ; Baker in Fl. Brit. India 2 : 234. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 105. 1938.

Woody climbers. Leaves 7 - 16 cm; Leaflets 1 - 2 x 0.3 - 0.5 cm, oblong, oblique at base, rounded emarginate, hairy beneath. Flowers ca 7 mm long, greenish white, on up to 5 cm long panicles. Pods strap shaped.

*Fl. & Fr.* : February - October.

Gandhigram, 98175.

*Distrib.* : INDIA : North - east & Southern India ; MYANMAR, MALAYA

**Dalbergia sissoo** Roxb. ex DC., Prodr. 2 : 416. 1825 ; Baker in Fl. Brit. India 2 : 231. 1876 ; Kanjilal *et al.*, Fl. Assam 2 : 100. 1938.

Trees up to 10 - 15 m high. Leaves 8 - 12 cm long ; leaflets 3 - 7 x 3 - 6 cm, ovate, orbicular, broadly elliptic, rounded at base, caudate acuminate or acuminate. Flowers ca 7 mm long, yellowish white, in axillary and terminal panicles. Pods ca 6 cm long, oblong elliptic, compressed, brownish.

*Fl. & Fr.* : February - November.

P. Kund, river bed, 96357.

*Distrib.* : INDIA : Throughout Northern & N. E. India ; AFRICA, WEST ASIA.

**Derris elegans** Benth. var. **vestita** (Baker) Prain in J. Asiat. Soc. Beng. 66 : 103. 1879 ; Verdc. in Kew Bull. 32 : 419. 1978. *Derris vestita* Baker in Fl. Brit. India 2 : 242. 1876. *D. ferruginea* (Roxb.) Benth. in Miq. Pl. Jungh. 252. 1852 ; Balakr., Fl. Jowai 1 : 163. 1981. *Robinia ferruginea* Roxb., Fl. Ind. 3 : 329. 1832.

Large climbers. Flowers in simple or branched racemes, white with pink tinge.

*Fl. & Fr.* : June - November.

27th mile forest, 84957.

*Distrib.* : INDIA : Sikkim, West Bengal, Arunachal Pradesh, Assam, Manipur, Meghalaya ; BANGLA DESH, MYANMAR.

**Desmodium caudatum** (Thunb.) DC., Prodr. 2 : 337. 1825 ; Deb Fl. Tripura 1 : 161. 1981. *Hedysarum caudatum* Thunb., Fl. Jap. 286. 1784. *H. laburnifolium* Poiret in Lam. Encycl. Meth. Bot. 6 : 422. 1804. *Desmodium laburnifolium* (Poiret) DC., Prodr. 2 : 337. 1825 ; Baker in Fl. Brit. India 2 : 163. 1876 ; Kanjilal *et al.*, Fl. Assam 2 : 47. 1938.

Under shrubs. Leaves trifoliate ; leaflets 5 - 10 x 1 - 4 cm, oblong lanceolate, acute. Flowers whitish, in long racemes. Fruits greenish, hairy.

*Fl. & Fr.* : October - February.

Thunba, 99513.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India, Western Ghats ; SRI LANKA, CHINA, JAPAN, MALAYSIA.

**Desmodium gyroides** (Link) DC., Prodr. 2 : 326. 1825 ; Baker in Fl. Brit. India 2 : 175. 1876 ; Balakr., Fl. Jowai 1 : 158. 1981. *Hedysarum gyroides* Link, Enum. alt. 2 : 247. 1822.

Shrubs, ca 2.5 m tall. Flowers in terminal or axillary racemes, pale pink to purple pink. Pods densely hairy.

*Fl. & Fr.* : September - January.

Deban nala, 85114.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; MALAYSIA.

**Dosmodium sequax** Wallich, Pl. Asiat. Rar. 2 : 46. t. 157. 1831 ; Baker in Fl. Brit. India 2 : 170. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 298. 1985.

Asm. : *Horu - biyoni*.

Shrubs, ca 3 m tall. Flowers in terminal and axillary racemes, reddish violet to pale purple.

Fl. & Fr. : July - February.

Deban nala, 85116 ; Kamlat to Walap, 87979.

Distrib. : INDIA : Uttar Pradesh, Sikkim, North - east India ; CHINA, MALAYSIA, FORMOSA.

**Desmodium triangulare** (Retz.) Merr. in J. Arn. Arb. 23 : 170. 1942 ; Balakr., Fl. Jowai 1 : 156. 1981. *Hedysarum triangulare* Retz., Obs. Bot. 3 : 40. 1783.

Erect shrubs, ca 2 m high. Flowers axillary, solitary, pale red. Pods sessile.

Fl. & Fr. : June - November.

Deban forest, 84929.

Distrib. : INDIA : Uttar Pradesh, Sikkim, North - east India ; SRI LANKA, CHINA, MALAYSIA.

**Desmodium triquetrum** (L.) DC., Prodr. 2 : 326. 1825 ; Baker in Fl. Brit. India. 2 : 163. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 299. 1985. *Hedysarum triquetrum* L., Sp. Pl. 746. 1753.

Asm. : *Ulucha*.

Under shrubs, ca 2.5 m tall. Flowers in long terminal axillary racemes, purplish - pink. Pods strap - shaped.

Fl. & Fr. : July - March.

M'Pen check gate, 83163.

Distrib. : INDIA : Throughout India ; BANGLA DESH, CHINA, MALAYA, PHILIPPINES.

**Flemingia macrophylla** (Willd.) D. Ktze, ex Merr. in Philipp. J. Sci. Bot. 5 : 130. 1910 ; Balakr., Fl. Jowai 1 : 165. 1981. *Crotalaria macrophylla* Willd., Sp. Pl. 3 : 982. 1802. *Flemingia congesta* Ait., Hort. Kew Ed. 2. 4 : 349. 1812 ; Baker in Fl. Brit. India 2 : 228. 1876.

Tall shrubs or small trees. Leaves 3 foliolate ; leaflets ovate or lanceolate, cuneate at base, acute. Flowers in simple or paniculate racemes, purplish. Ripe pods brown, seeds black.

*Fl. & Fr.* : April - February.

Kullung valley, Shirong to Hunung, 88091.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, CHINA, MALAYA, PHILIPPINES.

**Indigofera nigrescens** King & Prain in J. Asiat. Soc. Beng. 67 : 286, 1898 ; Kanjilal *et al.*, Fl. Assam 2 : 21, 1938.

Erect shrubs. Leaflets oblong - ovate or elliptic - oblong, cuneate at base, emarginate at apex. Flowers in axillary, dense flowered racemes, pinkish. Pods blackish.

*Fl. & Fr.* : August - December.

Kamlat to Walap, 87985 ; North of Gandhigram, 99685.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Mastersia assamica** Benth. in Miq., Pl. Jungh. 1 : 226, 1851 ; Kanjilal *et al.*, Fl. Assam 2 : 76, 1938.

Woody climbers ; branches terate, glabrous. Flowers in terminal and paniced racemes, violet with pink tinge. Fruits a pod, green.

*Fl. & Fr.* : August - December.

10th km away from Deban, 83665 ; Deban.

85055 ; Jairampur forest, 88236 ; Pangsu Pass, 88266.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Millettia cinerea** Benth. in Miq., Pl. Jungh. 249, 1852 ; Baker in Fl. Brit. India 2 : 106, 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 304, 1985.

Large climbers, young parts pubescent ; bark dull brown. Flowers in long panicles, ca 15 cm across, red.

*Fl. & Fr.* : June - November.

Deban forest, 85030 ; Krosam to Shirong,

88057 ; Kamlat to Walap, 88009.

*Distrib.* : INDIA : Tropical Himalaya, Assam, Meghalaya, Manipur ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Millettia pachycarpa** Benth. in Miq., Pl. Jungh. 250. 1852 ; Baker in Fl. Brit. India 2 : 106. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 305. 1985.

Asm. : *Holasi*.

Large climbers, young parts brown velvety. Flowers in long racemes, often paniced, light mauve.

Fl. & Fr. : March - December.

Burma nala, 87666 ; Jaitampur - Nampong forest, 88260.

*Distrib.* : INDIA : Tropical Eastern Himalaya, Sikkim, Arunachal Pradesh, Manipur, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Millettia piscida** Wight, Icon. t. 86. 1838 ; Baker in Fl. Brit. India 2 : 107. 1876 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 305. 1985.

Medium sized trees, ca 15m high ; bark greenish or dark - brown. Flowers in long racemes, ca 1.5 cm across, white.

Fl. & Fr. : June - December.

16th mile forest area, 85169.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR.

**Mucuna monosperma** DC. ex. Wight in Hort. Bot. Misc. 2 : 346. 1831 ; Kanjilal *et al.*, Fl. Assam 2 : 67. 1938.

Asm. : *Tang ting, Bonderdima*.

Large woody climbers with ribbed branches. Flowers in sub-corymbosc, axillary racemes, large, showy, dull purple with white stamens.

Fl. & Fr. : August - January.

Zero point forest area, 84917.

*Distrib.* : INDIA : Sikkim, Western Ghats, Tropical Eastern Himalaya, Assam, Meghalaya, Manipur, Tripura, Orissa ; SRI LANKA, BANGLA DESH, MYANMAR, THAILAND, MALAYA.

**Purearia peduncularis** (Benth.) Grab. ex Benth. in J. Linn. Soc. Bot. 9 : 124. 1867 ; Baker in Fl. Brit. India 2 : 197. 1876. *Neustanthus peduncularis* Benth. in Miq., Pl. Jungh. 235. 1852. in adnota.

Twinning herbs, clothed with grey hairs. Flowers bluish - white in long racemes ; rachis downy.

*Fl. & Fr.* : October - December.

20 km from M' Pen check gate, 83190.

*Distrib.* : INDIA : Sikkim, West Bengal, North east India ; PAKISTAN, NEPAL, BHUTAN, MYANMAR, CHINA.

**Shuteria vestita** Wight & Arn., Prodr. 207. 1834 ; Baker in Fl. Brit. India 2 : 181. 1876 ; Kanjilal *et al.*, Fl. Assam 2 : 63. 1938 ; Balakr., Fl. Jowai 1 : 167. 1981.

Weak climbers. Leaves pinnately 3 foliolate, leaflets oblong ovate, sub - obtuse at base, obtuse. Flowers in solitary, axillary racemes, red or purplish. Pods linear.

*Fl. & Fr.* : August - January.

Kamlat to Walap, 87977.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya, Western Ghats ; BHUTAN, SRI LANKA.

**Spatholobus parviflorus** (Roxb. ex DC.) O. Kuntze, Rev. Gen. Pl. 1 : 205. 1891 ; Ridder - Numan & Winiadinata in Reinwardtia 10 : 187. 1985. *Butea parviflora* Roxb. ex DC., Prodr. 2 : 415. 1825 ; Roxb., Fl. Ind. 3 : 248. 1832 ; Deb, Fl. Tripura 1 : 147. 1981. *Spatholobus roxburghii* Benth. in Miq., Pl. Jungh. 238. 1852 ; Baker in Fl. Brit. India 2 : 193. 1876.

Asm. : Hallot, Pan - lata.

Large climbers. Flowers in large terminal paniced racemes, cream coloured or whitish.

*Fl. & Fr.* : August - December.

27th mile camp, 84953.

*Distrib.* : INDIA : Throughout up to 1200 m in Himalaya ; NEPAL, BHUTAN, MYANMAR, BANGLA DESH, THAILAND, LAOS, COMBODIA, VIEINAM, JAVA, SRI LANKA.

**Tephrosia candida** DC., Prodr. 2 : 249. 1825 ; Balakr., Fl. Jowai 1 : 171. 1981. *Robinia candida* Roxb., Fl. Ind. 3 : 327. 1832.

Robust shrubs. Flowers in axillary terminal racemes, creamy white. Fruits pod, brownish.

*Fl. & Fr.* : August - February.

Krosam, 88023.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Assam, Bihar, Gujarat, Karnataka, Manipur, Meghalaya, Rajasthan, Tamilnadu, West Bengal ; BANGLA DESH, MYANMAR, MALAYA.

*Uraria crinita* (L.) Desv., J. de Bot. 1 : 123. 1813 ; Balakr., Fl. Jowai 1 : 155. 1981. *Hedysarum crinitum* L., Mant. Pl. 1 : 102. 1767.

Shrubs, stem pubescent. Flowers in terminal simple racemes, reddish violet to blue.

*Fl. & Fr.* : September - February.

Left bank of Deban nala, 85120.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Manipur, Mizoram, Tripura, Meghalaya ; MYANMAR, BANGLA DESH, CHINA, SRI LANKA, MALAYSIA.

#### CAESALPINIACEAE

*Bauhinia khasiana* Baker in Fl. Brit. India 2 : 281. 1878. *Phanera khasiana* (Baker) Thoth. in Bull. Bot. Soc. Beng. 19 : 131. 1965 ; Balakr., Fl. Jowai 1 : 173. 1981.

Large climbers, deeply fluted. Flowers in corymbose terminal panicles, yellowish to red.

*Fl. & Fr.* : June - July.

15th mile to Deban forest, 81109.

*Distrib.* : INDIA : North - East India. Endemic.

*Caesalpinia cucullata* Roxb., Fl. Ind. 2 : 358. 1832 ; Hattink in Reinwardtia 9 : 22. 1974. *Mezoneurum cucullatum* (Roxb.) Wight & Arn., Prodr. 283. 1834 ; Baker in Fl. Brit. India 2 : 258. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 322. 1985.

Large stragglers ; bark dark brown, prickly. Flowers bright yellow red ; anthers and filaments yellow.

*Fl. & Fr.* : September - June.

*Distrib.* : INDIA : Sikkim, North - east India, Bihar, South India, West Bengal, Andaman & Nicobar Islands ; NEPAL, BHUTAN, MYANMAR, THAILAND, VIETNAM, CHINA, MALAYSIA.

*Caesalpinia tortuosa* Roxb., Fl. Ind. 2 : 365. 1832 ; Baker in Fl. Brit. India 2 : 257. 1878. *C. cinclidocarpa* Miq., Fl. Ind. Bot. 1 (1) : 110. 1855 ; Baker in Fl. Brit. India 2 : 256. 1878.



Climbing shrubs, prickly. Flowers in terminal or axillary racemes, yellow.

*Fl. & Fr.* : September - February.

20 km Miao to Deban, 83185.

*Distrib.* : INDIA : West Bengal, North - east region; MYANMAR, CHINA, MALAYSIA.

**Cassia alata** L., Sp. Pl. 378. 1753 ; Deb., Fl. Tripura 1 : 117. 1981.  
*Senna alata* (L.) Roxb., Fl. Ind. 2 : 349. 1832.

Small shrubs, downy. Flowers in dense spike, yellow.

*Fl. & Fr.* : September - March.

Jairampur, 88247 ; Nampong, 88732.

*Distrib.* : INDIA : Cultivated naturalised in South & Eastern parts ; Pantropical.

**Cassia floribunda** Cav. Descr. 132. 1802. *C. laevigata* Willd., Enum. Hort. Berol. 441. 1809 ; Kanjilal *et al.*, Fl. Assam 2 : 132. 1938.

Herbs or undershrubs up to 1 m tall. Leaflets 3 - 5 pairs, 4 - 9 x 2 - 3 cm, ovate to elliptic, rounded to cuneate at base, acute to acuminate. Flowers *ca* 8.5 cm across, yellow, up to 10 cm long racemes. Pods *ca* 10 cm long, linear, cylindrical.

*Fl. & Fr.* : January - November.

Gandhigram, 99666.

*Distrib.* : INDIA : Naturalised in tropical Himalaya ; Native of tropical AMERICA.

**Cassia hirsuta** L., Sp. Pl. 379. 1753 ; Kanjilal *et al.*, Fl. Assam 2 : 131. 1938.

Tall herbs or small shrubs, hirsute. Leaflets ovate oblong, acuminate. Flowers in racemes, yellow. Pods slender, hirsute.

*Fl. & Fr.* : November - February.

Nampong forest, 88720.

*Distrib.* : INDIA : Throughout India ; Native of Tropical AMERICA.

**Cassia occidentalis** L., Sp. Pl. 377. 1753 ; Deb., Fl. Tripura 1 : 119. 1981.

Asm. : *Hant - thenga*.

Tall herbs or small shrubs, ca 1 - 1.5 m tall. Flowers in short axillary or terminal corymbose racemes, yellow.

Fl. & Fr. : April - October.

Deban forest, 88643.

*Distrib.* : INDIA : Naturalised throughout pantropical weed - a native of SOUTH AMERICA.

### MIMOSACEAE

**Acacia caesia** (L.) Willd., Sp. Pl. 4 : 1090. 1876 ; Nielson in Adansonia 2, 19 : 348. 1980. *Mimosa caesia* L., Sp. Pl. 522. 1753. *Acacia intsia* auct. non (L.) Willd. 1805, p.p. ; Wight & Arn., Prodr. 278. 1834 ; Baker in Fl. Brit. India 2 : 297. 1878. *Mimosa intsia* L., Sp. Pl. 522. 1753. *Acacia intsia* (L.) Willd. var. *caesia* (L.) Wight & Arn. ex Baker in Fl. Brit. India 2 : 297. 1878.

Large woody prickly climbers. Flowers in yellow heads. Pod straight, brownish, ca 15 cm long with flattened seeds.

Fl. & Fr. : October - March.

South Bank of Noa - Dihing river, 85023.

*Distrib.* : INDIA : Karnataka, Maharashtra, Orissa ; SRI LANKA.

**Acacia caesia** var. **subnuda** (Craib) Nielson in Adansonia 2, 19 : 348. 1980 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 329. 1985. *Acacia oxyphylla* Grah. ex Benth. var. *subnuda* Craib, Fl. Siam Enum. 1 : 550. 1828. *Acacia intsia* (L.) Willd. var. *oxyphylla* (Grah. ex Benth.) Baker in Fl. Brit. India 2 : 297. 1876.

Asm. : *Pochui - kaint*.

Prickly climbers, branchlets fluted with recurved prickles. Flowers in heads, 1 - 2 together in terminal panicles. Pods dark brown.

Fl. & Fr. : September - February.

*Distrib.* : INDIA : North - east India ; MYANMAR, THAILAND, INDO - CHINA.

**Albizia julibrissin** Durazz var. **mollis** (Wallich) Benth. in Hook. Lond. J. Bot. 3 : 91. 1834 ; Nielson in Adansonia 2, 19 : 212. 1979. *Acacia mollis* Wallich, Pl. Asiat. Rar. 2 : 76. t. 172. 1831 ; Baker in Fl. Brit. India

2 : 300. 1878. *Albizia mollis* (Wallich) Boivin in Encycl. 19 : Siecl. 2 : 33. 1838 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 335. 1985.

Medium sized trees. Flowers in racemose heads, greenish - yellow or whitish.

*Fl. & Fr.* : April - October.

Burma nala, 87933.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, JAPAN.

*Albizia lebbeck* (L.) Benth. in Hook. Lond. J. Bot. 3 : 87. 1844 ; Baker in Fl. Brit. India 2 : 298. 1879 ; Kanjilal *et al.*, Fl. Assam 2 : 165. 1938. *Mimosa lebbeck* L., Sp. Pl. 516. 1753. *Acacia lebbeck* (L.) Willd., Sp. Pl. 4 : 1066. 1806.

Large deciduous trees up to 10 m high. Rachis 7 - 12 cm long, glandular at base and apex ; pinnae 5 - 20 cm long, obovate, oblong, unequal at base, obtuse or retuse. Flowers *ca* 5 cm across, greenish - white. Pods 10 - 25 cm long, yellowish - brown.

*Fl. & Fr.* : April - January.

P. Kund, 99471.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, SRI LANKA, SOUTH - EAST ASIA.

*Albizia odoratissima* (L. f.) Benth., Lond. J. Bot. 3 : 88. 1844 ; Baker in Fl. Brit. India 2 : 299. 1878 ; Kanjilal *et al.*, Fl. Assam. 2 : 164. 1938. *Mimosa odoratissima* L. f., Suppl. Pl. 437. 1781.

*Asm.* : *Goroi*.

Small, deciduous trees. Leaflets falcate, glaucous beneath. Flowers sessile, in paniculate heads. Pods flat, reddish - brown.

*Fl. & Fr.* : March - February.

Shirong - Hunung, 88201.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALACCA.

*Albizia procera* (Roxb.) Benth. in Hook. Lond. J. Bot. 3 : 89. 1844 ; Baker in Fl. Brit. India 2 : 299. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 336. 1985. *Mimosa procera* Roxb., Pl. Corom. 2 : 12, t. 121. 1799.

*Asm.* : *Korai*.

Tall trees, ca 25 m high, crown lax, spreading. Flowers in heads ; heads 1 - 5 together in large panicles, yellowish - white.

*Fl. & Fr.* : May - December.

Noa - Dihing river, 84904.

*Distrib.* : INDIA : Throughout India ; Tropical ASIA, except MALAYA Peninsula, AUSTRALIA.

*Entada pursaetha* subsp. *sino-himalensis* Grierson & Long in Notes Bot. Gard. Edinburgh 37 : 348. 1979. *Entada scandens* non (L.) Benth. ; Baker in Fl. Brit. India 2 : 287. 1878, *p.p.*; Balakr., Fl. Jowai 1 : 180. 1981. *E. entida* Brenan in Kew Bull. 1955 : 165. 1955.

*Asm.* : *Bor ghilla*.

Thick liana, stem much twisted, angled ; bark blackish. Flowers in long spikes, minute, greenish turning whitish - yellow.

*Fl. & Fr.* : March - May.

25th mile, 87909 ; Nampong forest, 81213 ;

Miao to Deban, 96363.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland, Manipur, Meghalaya ; NEPAL, BANGLA DESH, CHINA.

*Pithecellobium heterophyllum* (Roxb.) Macbr. in Contr. Gray Herb. n.s. 39 : 3. 1919. *Mimosa heterophylla* Roxb., Hort. Beng. 40. 1814 & Fl. Ind. 2 : 545. 1832.

Medium sized trees, ca 15 m high. Flowers in heads ; heads lax ca 1.5 cm across, in terminal panicles. Flowers greenish - yellow.

*Fl. & Fr.* : March - January.

22 km to Deban, 83533.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR MALAYSIA.

## ROSACEAE

*Docynia indica* (Wallich) Decne. in Nour. Brit. Mus. Paris. 10 : 131. t. 14. 1874 ; Hook. f., Fl. Brit. India 2 : 369. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 345. 1985. *Pyrus indica* Wallich, Pl. Asiat. Rar. 2 : 56. t. 173. 1831.

Medium sized trees ; bark dark or blackish brown with thorns. Flowers in umbels or fascicles, rarely solitary, white, densely woody.

*Fl. & Fr.* : February - December.

*Distrib.* : INDIA : Sikkim, North east India ; BHUTAN, MYANMAR.

*Duchesnea indica* (T. Anderson) Focke in Engler & Prantl, *Pflanzenfam* 3 (3) : 33. 1888 ; Balakr., *Fl. Jowai* 1 : 187. 1981. *Fragaria indica* T. Anderson, *Bot. Repos.* 7 : t. 479. 1807.

Perennial herbs with hairy stem. Flowers solitary or in terminal cymes, yellow.

*Fl. & Fr.* : March - August.

Happy valley area, 83777.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India, Nilgiris ; MALAYA, FORMOSA, JAPAN, AFGHANISTAN.

*Eriobotrya bengalensis* (Roxb.) Hook. f., *Fl. Brit. India* 2 : 371. 1878 ; Kanjilal *et al.*, *Fl. Assam* 2 : 215. 1938. *Mespilus bengalensis* Roxb., *Fl. Ind.* 2 : 510. 1824.

*Asm* : *Laru - bandha*

Tall trees ; branchlets at top. Leaves elliptic - oblong or obovate, coriaceous, glossy above. Flowers in terminal panicles, white, fragrant. Berry 1 celled.

*Fl. & Fr.* : February - October.

40th mile, M.V. road, 79207.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; BANGLA DESH, MYANMAR, MALAYA.

*Neillia thrysiflora* D. Don, *Prodr. Fl. Nep.* 228. 1825 ; Hook. f., *Fl. Brit. India* 2 : add 1. 1878 ; Kanjilal *et al.*, *Fl. Assam* 2 : 206. 1938.

Climbing shrubs, up to 3 m tall. Leaves 4 - 10 x 2 - 5 cm, ovate, ovate - lanceolate, truncate or rounded at base, long acuminate. Flowers ca 5 mm across, white, in panicles.

*Fl. & Fr.* : May - January.

Gandhigram, 99627.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, CHINA, SUMATRA.

*Photinia integrifolia* Lindley in *Trans. Linn. Soc.* 13 : 103. 1821 ; Hook. f., *Fl. Brit. India* 2 : 381. 1878 ; Kanjilal *et al.*, *Fl. Assam* 2 : 222.

1938. *Pyrus integerrima* D. Don, Prodr. Fl. Nep. 237. 1825., *Photinia integerrima* (D. Don) Balakr., Fl. Jowai 1 : 191. 1981.

Trees up to 15 m high. Leaves 6 - 15 x 3 - 6 cm, elliptic - obovate or oblanceolate, cuneate at base, obliquely acuminate. Flowers ca 9 mm across, yellowish white, in terminal corymbose panicles. Fruits ca 8 mm, obovoid, yellow turning purple - brown later.

*Fl. & Fr.* : February - November.

Miao forest, 98051.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

***Rubus alceifolius*** Poiret in Lam, Encycl. 6 : 247. 1804 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 364. 1985.

Subscandent shrubs with recurved prickles. Flowers in long racemes, glomerate, white.

*Fl. & Fr.* : May - November.

Zero camp, 84906.

*Distrib.* : INDIA : North - east region, South India ; MYANMAR, SRI LANKA, MALAYA.

***Rubus burkillii*** Rolfe in Kew Bull. 1920 : 109. 1920 ; Kanjilal *et al.*, Fl. Assam 2 : 202. 1938.

Straggling shrubs. Leaves ovate to sub - orbicular, hairy along nerves on both surfaces. Flowers in axillary or terminal sub - corymbose racemes, white. Drupes red.

*Fl. & Fr.* : October - April.

22 - 32 km from Miao, 83631.

*Distrib.* : INDIA : Arunachal Pradesh. Endemic.

***Rubus hamiltonii*** Hook. f., Fl. Brit. India 2 : 328. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 191. 1938.

Shrubs ; branchlets with prickles. Leaves lanceolate, or oblong lanceolate, acuminate. Flowers in panicles, white. Fruit red.

*Fl. & Fr.* : September - February.

27th mile camp, 84977.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam; NEPAL, BHUTAN.

**Rubus insignis** Hook. f., Fl. Brit. India 2 : 329. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 193. 1938.

*Asm.* : Bor - sereli kaint.

Large scandent or climbing shrubs, with small prickles. Leaves ovate, cordate, shortly or abruptly acuminate, petiole densely prickly. Flowers in lax terminal panicles, white. Fruits black drupes.

*Fl. & Fr.* : March - December.

Deban forest, 88286 ; on the way to Vijoyagar, 99545.

*Distrib.* : Arunachal Pradesh, Meghalaya ; BHUTAN.

**Rubus lineatus** Reinw. ex Blume, Bijdr. 1108. 1826 ; Hook. f., Fl. Brit. India 2 : 333. 1878.

Shrubs or erect herbs. Leaves 5 - foliolate ; leaflets elliptic - oblong, caudate, acuminate. Flowers in axillary short heads, white. Drupes red.

*Fl. & Fr.* : November - March.

22 - 23 km from Miao, M.V. road, 83607.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, MYANMAR, CHINA, JAVA, MALAYSIA.

**Rubus lucens** Focke in Breman, Abh. Nat. ver. 4 : 199. 1874 ; Hook. f., Fl. Brit. India 2 : 338. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 367. 1985.

*Asm.* : Jejeru - poke, Thejhelu.

Large scandent shrubs with scattered recurved prickles. Flowers in panicles, ca 1 cm across, reddish.

*Fl. & Fr.* : September - January.

Miao forest, 83114 ; Salt lick forest, 83549 ;

29th miles, 86608 ; Pangs Pass, 88271 ; Haldibari, 99426.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Rubus niveus** Thunb. var. *rosaefolius* (Hook. f.) Hara, Fl. E. Himal 130. 1966 . *R. lasiocarpus* Smith var. *rosaefolius* Hook. f., Fl. Brit. India 2 : 341. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 200. 1938.

Scandent prickly shrubs, with gland tipped stiff hairs. Leaves imparipinnate ; leaflets 5 - 9 x 2 - 4 cm, ovate, lanceolate, acuminate. Flowers large, solitary or paniced, white. Fruits oblong, scarlet.

*Fl. & Fr.* : December - March.

Miao forest, 98068.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN.

**Rubus paniculatus** Smith in Rees Cyclop. 30 : n. 41. 1819 ; Hook. f., Fl. Brit. India 2 : 329. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 192. 1938.

Climbing shrubs ; branchlets prickly. Leaves broad ovate, cordate, many serrate, acuminate. Flowers in lax terminal panicles, white. Drupes black.

*Fl. & Fr.* : October - March.

22km from Deban I.B., 83519.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, West Bengal, Sikkim, Arunachal Pradesh, Meghalaya.

**Rubus rugosus** Smith in Rees Cyclop. 30 : n. 34. 1819 ; Balakr., Fl. Jowali 1 : 186. 1981. *R. moluccanus* non L., 1753 ; Hook. f., Fl. Brit. India 2 : 330. 1878, *p.p.* ; Kanjilal *et al.*, Fl. Assam 2 : 194. 1938.

Straggling shrubs, retroscely prickled. Leaves 3 - 7 x 2 - 6 cm, ovate, orbicular, cordate at base, rounded or obtuse. Flowers *ca* 1 cm across, yellowish - white, in simple or paniced racemes. Fruits *ca* 1 cm diam., sub - globose, bright - red.

*Fl. & Fr.* : May - September.

Deban forest, 98065.

*Distrib.* : INDIA : Sikkim, North - east India, NEPAL, BHUTAN.

#### HYDRANGEACEAE

**Hydrangea robusta** Hook. f. & Thomson in J. Linn. Soc. 2 : 76. 1858 ; C.B. Clarke in Fl. Brit. India 2 : 404. 1878 ; Kanjilal *et al.*, Fl. Assam 2 : 227. 1938.

Large shrubs ; young parts pubescent. Leaves elliptic or ovate, rounded at base, acuminate. Flowers in paniculate corymbs, blue. Capsules ribbed.

*Fl. & Fr.* : April - February.



Karmlat to Krosam, 88021 ; East of Gandhigram, 99638.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BHUTAN.

### ITEACEAE

*Itea macrophylla* Wallich in Roxb., Fl. Ind. 2 : 419. 1824 ; C.B. Clarke in Fl. Brit. India 2 : 408. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 371. 1985.

Small trees or shrubs. Flowers in simple racemes, ca 0.5 cm across, white with pale pink tinge.

*Fl. & Fr.* : April - January.

Nampong forest, 81219 ; P. Kund, 99447 ; 17th km point M.V. road, 96374.

*Distrib.* : INDIA : North - east India ; MALAYA.

### CRASSULACEAE

*Sinocrassula indica* (Decne.) Berger in Engler & Prantl, Nat. Pflanzl. ed. 2. 189 : 462. 1930 ; Lauener in Notes R. Bot. Gard. Edinb. 30 : 292. 1970. *Crassula indica*. Decne ; C.B. Clarke in Fl. Brit. India 2 : 413. 1878.

Herbs, glabrous ; stem ca 20 cm, leafy. Lower leaves ca 3 cm long, blunt ; stem leaves sessile, oblong. Flowers in panicles, dull rose or pink.

*Fl. & Fr.* : January - April.

Lai valley, Tulung - Kunung, 87972.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh ; BHUTAN.

### HAMAMELIDACEAE

*Altingia excelsa* Noronha in Verh. Bot. Gen. 5. ed. 11 : 41. 1827 ; Kurz. For. Fl. Brit. Burma 1 : 446. 1877.

*Asm.* : Duong, Jutuli ; *Abori.* : Shi - rih.

Deciduous trees, glabrous. Leaves oblong to ovate ; oblong, rounded at base, acuminate. Flowers in heads ; male flowers head almost sessile ; female flowers head long peduncled. Fruits globose, velvety tomentose, woody.

*Fl. & Fr.* : October - March.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR.

**Exbucklandia populnea** (R. Br. ex Griffith) R.W. Br. in J. Wash. Acad. Sc. 36 : 348. 1946 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 374. 1985. *Bucklandia populnea* R. Br. & Griffith in Asiat. Res. 19 (1) : 84. t. 13 - 14. 1836.

Trees, ca 35 m high. Flowers in heads ; heads 10 - 20 flowered. Fruits woody, capsule.

*Fl. & Fr.* : October - February.

40th mile forest, 87924 ; South of Gandhigram, 99664.

*Distrib.* : INDIA ; Temperate Himalaya, North - eastern India ; MALAYA

### COMBRETACEAE

**Combretum dasystachyum** Kurz in J. Asiat. Soc. Beng. 43 (2) : 187. 1874 ; C.B. Clarke in Fl. Brit. India 2 : 457. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 379. 1985.

*Asm.* : *Holok - lota*.

Woody climbers ; young parts rusty or brown villous or tomentose. Flowers in terminal panicles, yellow or greenish - yellow.

*Fl. & Fr.* : April - December.

25th mile, 87906 ; Deban area, 79017.

*Distrib.* : INDIA : North - east India ; BANGLA DESH, MYANMAR.

**Combretum flagrocarpum** C.B. Clarke in Hook. f., Fl. Brit. India 2 : 455. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 381. 1985.

Straggling or scandent shrubs, young parts brown or reddish, tomentose. Flowers in terminal or axillary panicles, yellow.

*Fl. & Fr.* : May - December.

Deban forest, 85359 ; M'Pen check gate, 81006 ; 10th. mile forest area, 87786 ; M'Pen, 81027 ; Jairampur - Nampong forest, 88252 ; 22 km. to Deban I.B., 83509.

*Distrib.* : INDIA : North-eastern India ; MYANMAR.

**Combretum punctatum** Blume, Bijdr. 640. 1825. subsp. **squamosum** (Roxb. ex D. Don) Exell, Fl. Malesiana 4 : 539. 1954 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 382. 1985. *C. squamosum* Roxb. ex D. Don in Trans. Linn. Soc. 15 : 419. 1827.

*Asm.* : *Setta abung taru*.

Large woody climbers, bark greenish - brown, young parts covered with peltate scales. Flowers in axillary or terminal panicles, yellowish - white.

*Fl. & Fr.* : April - January.

Miao forest, 81070.

*Distrib.* : INDIA : North - east India ; MALAYA.

**Terminalia chebula** Retz., Obs. Bot. 5 : 3<sup>n</sup> 1788 ; C.B. Clarke in Fl. Brit. India 2 : 446. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 384. 1985. *Myrobalanus chebula* Gaertner, Fruct. 2 : 91, t. 97. 1791.

Asm. : *Hilika*.

Trees, ca 35 m high ; bark grey to blackish grey. Flowers ca 0.6 cm across, yellow. Fruits obovoid - ellipsoid capsule.

*Fl. & Fr.* : May - February.

Salt lick forest, 81061 ; Noa - Dihing river near 10th mile, 87771.

*Distrib.* : INDIA : Throughout India ; MALAYA.

**Terminalia citrina** (Gaertner) Flem. in Asiat. Res. 11 : 183. 1810 ; C.B. Clarke in Fl. Brit. India 2 : 446. 1878 ; Balakr., Fl. Jowai 1 : 197. 1981. *Myrobalanus citrina* Gaertn., Fruct. 2 : 91, t. 97. 1791.

Asm. : *Hilikha*.

Large trees, ca 30 m high ; stem buttressed at base. Flowers in panicle racemes, yellow. Fruits 5 angled.

*Fl. & Fr.* : April - December.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR

**Terminalia myriocarpa** Heurck. & Muell.- Arg. in Heurck Obs. Bot. 215. 1870 ; C.B. Clarke in Fl. Brit. India 2 : 448. 1878 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 385. 1985.

Asm. : *Holok, Jhakula*.

Trees, ca 35 m high, bark grey, greyish - brown. Flowers in terminal or axillary panicles, yellow.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MYANMAR.

## MYRTACEAE

**Syzygium cumini** (L.) Skeels in U.S. Dept. Ag. Bur. Pl. Indus. Bull. 248. 25. 1912 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 394. 1985. *Myrtus cumini* L., Sp. Pl. 471. 1753. *Eugenia jambolana* Lam., Encycl. Meth. Bot. 3 : 198. 1789.

Asm. : *Kothiajam*.

Trees, 10 - 20 m. Flowers clustered in panicles, white or greenish white. Fruits oblong - ellipsoid, red purple to black, edible.

*Fl. & Fr.* : March - July.

Miao forest, 81146.

*Distrib.* : INDIA : Throughout India ; MALAYA, CHINA.

*Syzygium cuneatum* (Duthie) Balakr., Fl. Jowai 1 : 199. 1981.

*Eugenia cuneata* Duthie in Fl. Brit. India 2 : 495. 1878.

Shrubs or small trees. Flowers greenish white. Fruits globose berry, reddish - black at maturity.

*Fl. & Fr.* : August - December.

Deban forest, 85144.

*Distrib.* : INDIA : West Bengal, North east India ; BANGLA DESH.

*Syzygium kurzii* (Duthie) Balakr. in Bull. Bot. Surv. India 22 : 174. 1980. *Eugenia kurzii* Duthie in J. Asiat. Soc. Beng. 46 (2) : 68. 1877 & in Fl. Brit. India 2 : 478. 1879.

Asm. : *Bogi - jamuk*.

Tall trees. Flowers white. Fruits a globose berry, crowned by the calyx limb.

*Fl. & Fr.* : May - September.

36th mile, 87628 ; Hornbill, 87708.

*Distrib.* : INDIA : North east India ; MYANMAR.

#### MELASTOMACEAE

*Blastus cochinchinensis* Lour., Pl. Cochinch. 527. 1790 ; C.B. Clarke in Fl. Brit. India 2 : 528. 1879.

Asm. : *Phutkola*.

Tall shrubs or small trees. Flowers small, white, in clusters. Fruits a furrowed capsule.

*Fl. & Fr.* : August - February.

Deban forest, 85096 ; South bank of Noa Dihing river, 85145.

*Distrib.* : INDIA : North - east India ; MALAYSIA.

*Medinilla erythrophylla* Lindley in Edgew. Bot. Reg. 24 (Misc.) : 85. 1838 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 405. 1985.

Asm. : *Bogi tenga*.

Shrubs. Flowers pinkish white. Fruits berry, black when ripe.

*Fl. & Fr.* : July - December.

27th mile, 84980 ; 22 - 32 km from Miao to M.V. road, 83612 ;  
Deban to 40th mile, 99561 & 99581.

*Distrib.* : INDIA : North - east India ; BHUTAN, MALAYA.

*Melastoma malabathricum* L., Sp. Pl. 390. 1753 ; Haridasan &  
Rao, For. Fl. Meghalaya 1 : 407. 1985.

Asm. : *Phutuki*.

Bushy shrubs. Flowers purple in fascicles. Fruits ovoid berry,  
purple.

*Fl. & Fr.* : Throughout the year ; more during October - December.

Imbeong forest, 87608 ; West of Gandhigram, 99614 ; On way to  
Vijayanagar, 99560.

*Distrib.* : INDIA : Throughout India ; MALAYA.

*Osbeckia chinensis* L., Sp. Pl. 345. 1753 ; Balakr., Fl. Jowai 1 :  
206. 1981. *Osbeckia angustifolia* D. Don, Prodr. Fl. Nep. 221. 1825.

Tall herbs. Flowers pale purple to pink purple. Fruits ovoid,  
capsules.

*Fl. & Fr.* : June - December.

M' Pen check gate, 83149, 88612.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ;  
BHUTAN, MYANMAR, AUSTRALIA.

*Osbeckia nepalensis* Hook. Exot. Fl. t. 31. 1822 ; Balakr., Fl. Jowai  
1 : 205. 1981.

Shrubs. Flowers white or purple in terminal or axillary cymes.  
Fruits campanulate capsule.

*Fl. & Fr.* : September - March.

Lohit valley, 88016.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, MYANMAR  
THAILAND, CHINA.

*Osbeckia nutans* Triana in Trans. Linn. Soc. 28 : 54. 1871 ;  
Balakr., Fl. Jowai 1 : 205. 1981.

Small shrubs. Flowers purplish. Fruits campanulate capsule.

*Fl. & Fr.* : October - February.

Left bank of Deban nala, 85108 ; M.V. road, 99555.

*Distrib.* : INDIA : North - east India ; BHUTAN.

*Oxyspora cernua* (Roxb.) Triana in Trans. Linn. Soc. 28 : 73. 1872 ; C.B. Clarke in *Fl. Brit. India* 2 : 526. 1879 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 412. 1985. *Melastoma cernua* Roxb., Fl. Ind., 2 : 404. 1832.

Straggling shrubs. Flowers pink in terminal panicles. Fruits ovoid capsule, reddish.

*Fl. & Fr.* : September - March.

22 - 32 km from Miao, 83658.

*Distrib.* : INDIA ; North - east India ; BANGL. DESH, MYANMAR.

*Oxyspora paniculata* DC., Prodr. 3 : 123. 1828 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 412. 1985.

Tall herbs or small shrubs. Flowers pinkish purple. Fruits ellipsoid, capsule, red.

*Fl. & Fr.* : July - December.

M' Pen check gate, 83132 ; Hornbill Firmbase, 83687 ; Noa Dihing river near Deban, 85138 ; Deban forest, 88611 ; On way to Vijoyagar, 99592, 99537, 99534 & 99541 ; 77th mile, 99592.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BHUTAN.

*Sarcopyramis nepalensis* Wallich, Tent. Fl. Nep. 32. t. 23. 1824 ; Balakr., Fl. Jowai 1 : 207. 1981.

Erect herbs with pinkish stem. Flowers pinkish purple. Fruits ovoid capsules.

*Fl. & Fr.* : July - October.

Imbeong, 87605 ; Firmbase to Bulbulia, 83725 & 99574.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, MYANMAR, MALAYA, SUMATRA, CHINA.

#### LYTHRACEAE

*Cuphea balsamiana* Ch. & Schl. in Linnaea 11 : 363. 1827 ; Deb in J. Bombay Nat. Hist. Soc. 70 (1) : 18. 1973.

Small prostrate herbs near water sources, stem hairy. Leaves opposite. Flowers axillary, pinkish or bright violet, 1 or 2, with large bracts. Fruits yellowish.

*Fl. & Fr.* : June - February.

Salt lick forest, 81037 ; M' Pen check gate, 83144 ; Shirong to Hunung, 88203.

*Distrib.* : INDIA : Arunachal Pradesh ; BRAZIL.

**Rotala macrandra** Koehne in Engler, Bot. Jahrb. 19 : 176. 1880 ; Cook in Boissiera 29 : 54. 1979. *Ameletia rotundifolia* Wight, Icon. t. 258. 1840, non Buch. - Ham. 1825 ; C.B. Clarke in Fl. Brit. India 2 : 566. 1879 p.p.

Erect herbs up to 30 cm tall, stems 4 angled. Leaves variable, linear to orbicular or ovate to orbicular. Flowers minute, bright red in terminal branched spikes. Capsule globose, red.

*Fl. & Fr.* : November - March.

Gandhigram, Paddy fields, 99644.

*Distrib.* : INDIA : Throughout the plains in India ; SRI LANKA, CHINA, FORMOSA.

### SONNERATIACEAE

**Duabanga grandiflora** (Roxb. ex DC.) Walp., Rcp. 2 : 114. 1843 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 416. 1985. *Lagerstroemia grandiflora* Roxb. ex DC., Mem. Soc. Hist. Nat. Geneve, 32 : 84. 1824. *Duabanga sonneratioides* Buch. Ham. in Trans. Linn. Soc. 17 : 177. 1837 ; C.B. Clarke in Fl. Brit. India 2 : 579. 1879 ; Kanjilal *et al.*, Fl. Assam 2 : 312. 1938.

*Asm.* : *Khukan, Hokul.*

Tall evergreen trees ; branches drooping. Flowers large, white., Fruit a capsule, dirty brown.

*Fl. & Fr.* : March - October.

Miao, 79039 ; 22 - 32 km from Miao, 87836 & 99544.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, MYANMAR.

Under cultivation. Wood used for plywood.

## ONAGRACEAE

**Ludwigia octovalvis** (Jacq.) Raven in Kew Bull. 15 : 476. 1962 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 176. 1979. *Oenothera octovalvis* Jacq., Enum. Syst. Pl. 19. 1760. *Jussiaea suffruticosa* L., Sp. Pl. 388. 1753 ; C.B. Clarke in Fl. Brit. India 2 : 587. 1879.

Much branched herbs, stem reddish. Flowers axillary, yellow. Fruit a capsule, 8 - ribbed, reddish ; seeds small white.

*Fl. & Fr.* : November - March.

Firmbase, 83721.

*Distrib.* : INDIA : Throughout India, except Western desert ; SOUTH - EAST ASIA, AFRICA, POLYNESIA & AMERICA.

## PASSIFLORACEAE

**Adenia trilobata** (Roxb.) Engler in Bot. Jahrb. 14 : 376. 1981 ; Balakr., Fl. Jowai 1 : 209. 1981 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 418. 1985. *Modecca trilobata* Roxb., Fl. Ind. 3 : 133. 1832.

Large climbers. Flowers in axillary cymes, white. Fruit a capsule, ellipsoid, scarlet when ripe.

*Fl. & Fr.* : June - September.

27th mile forest area on M.V. road, 84951.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

## CUCURBITACEAE

**Diplocyclos palmatus** (L.) Jeffrey in Kew Bull. 15 : 352. 1962 ; Balakr., Fl. Jowai 1 : 211. 1981. *Bryonia palmata* L., Sp. Pl. 1012. 1753. *B. laciniosa sensu* L., Sp. Pl. 1013. 1753, *p.p. quoad* Syn Cit. excl. type ; C.B. Clarke in Fl. Brit. India 2 : 622. 1879.

Climbing herbs. Leaves ovate, palmately 3 - 9 fid, widely cordate at base, denticulate. Flowers ca 1.5 cm across, yellow. Berries yellowish - green.

*Fl. & Fr.* : April - October.

Deban, 98173.

*Distrib.* : INDIA : Throughout India ; AFRICA, BHUTAN, SRI LANKA, CHINA, JAPAN, MALAYSIA, AUSTRALIA.



**Gynostemma pedata** Blume, Bijdr. 23. 1825 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 424. 1985.

Slender scandent shrubs. Flowers in lax axillary panicles, white. Fruits globose, olive green.

*Fl. & Fr.* : June - December.

27th mile, 84952.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BANGLA DESH, MYANMAR, NEPAL, CHINA, JAPAN, MALAYA.

**Hodgsonia macrocarpa** (Blume) Cong. in DC., Monogr. Phan. 3 : 349. 1881 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 420. 1985. *Trichosanthes macrocarpa* Blume, Bijdr. 935. 1826. *Hodgsonia heteroclita* (Roxb.) Hook. f. & Thomson in Proc. Linn. Soc. 2 : 257. 1853; C.B. Clarke in Fl. Brit. India 2 : 606. 1879.

*Asm.* : Tapouguti, Thebou lata.

Woody climbers. Flowers yellow outside, white inside. Fruits large, 12 grooved, reddish brown.

*Fl. & Fr.* : February - August.

Miao forest, 83122.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BANGLA DESH, MYANMAR, CHINA & MALAYA.

*Note* : The bark is extremely bitter.

**Melothria leucocarpa** (Blume) Cong. in DC., Monogr. Phan. 3 : 601. 1881. *Bryonia leucocarpa* Blume, Bijdr. 924. 1826 ; Chakrav. in Fasc. Fl. India 11 : 82. 1982.

Climbers with filiform tendrils. Flowers small, fasciculate. Fruits globose, mucronate, glabrous.

*Fl. & Fr.* : October - January.

22 - 32 km from Miao, 83632.

*Distrib.* : INDIA : Himachal Pradesh, Punjab, Uttar Pradesh, West Bengal, Sikkim, Arunachal Pradesh, Assam, Nagaland, Meghalaya ; MYANMAR, CHINA, MALAYSIA.

**Momordica dioica** Willd., Sp. Pl. 4 : 605. 1805 ; Balakr., Fl. Jowai 1 : 214. 1981.

Perennial climbers with tuberous roots. Flowers in fascicles or solitary, yellow. Fruits ovoid berries, beaked at base ; seeds yellow.

*Fl. & Fr.* : June - October.

Burdumsa to Rajnagar, 88225.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, CHINA.

*Neosomitra clavigera* (Wallich) Hutch. in Ann. Bot. (n.s.) 6 : 100. 1942 ; Chakrav. in Fasc. Fl. India 11 : 96. 1982. *Zanomiu clavigera* Wallich, Pl. Asiat. Rar. 2 : 28. 1831.

Semi woody climbers. Leaves 3 foliate. Inflorescence branched, many flowered. Flowers light green. Fruits sub cylindrical, yellow.

*Fl. & Fr.* : October - March.

Pangsu Pass forest, 88278.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BANGLA DESH, MYANMAR, MALAYSIA.

*Thladiantha cordifolia* (Blume) Cong. in DC., Monogr. Phan. 3 : 424. 1881 ; Chakrav. in Fasc. 11 : 102. 1982 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 180. 1979. *Luffa cordifolia* Blume, Bijdr. 929. 1826.

Large climbers. Flowers dioecious ; male flowers with prominent bracts, yellow, lips oblong, sub - cylindrical.

*Fl. & Fr.* : May - October.

27th mile, 84956, 87879 ; 33rd mile, 87645.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, THAILAND & MALAYA.

*Thladiantha hookeri* C.B. Clarke in Fl. Brit. India 2 : 631. 1879 ; Balakr., Fl. Jowai 1 : 210. 1981.

Large climbers, Flowers golden yellow : male flowers without bracts. Fruits oblong, both sides round.

*Fl. & Fr.* : May - July.

34th mile forest area, 87637 ; Deban forest, 85032 ; 16th mile point, 85174.

*Distrib.* : INDIA : Sikkim, North east India ; BHUTAN, MYANMAR, CHINA, MALAYSIA.

**Trichosanthes himalensis** C.B. Clarke in Fl. Brit. India 2 : 608. 1879 ; Balakr., Fl. Jowai 1 : 212. 1981.

Extensive climbers. Leaves 3 - 5 lobed. Flowers 4 - 10 together, yellowish white. Fruits berry, oblong - ovoid ; seeds drum shaped.

*Fl. & Fr.* : August - October.

20th mile onwards to M' Pen, 83192.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Arunachal Pradesh, Assam ; BANGLA DESH, CHINA, MALAYSIA.

**Trichosanthes tricuspidata** Lour., Fl. Cochinch. 589. 1790 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 422. 1985. *T. bracteata* (Lam.) Voigt Cal. Hort. Calc. Sp. 1845 ; Balakr., Fl. Jowai 1 : 213. 1981.

Large climbers with 2 - 5 fid tendrils. Leaves 3 - 7 lobed. Flowers with fimbriate corolla. Fruits with 10 longitudinal orange streaks.

*Fl. & Fr.* : June - November.

22 - 32 km forest area, 83628.

*Distrib.* : INDIA : Throughout India ; MYANMAR, MALAYSIA, CHINA, AUSTRALIA.

### BEGONIACEAE

**Begonia aborensis** Dunn in Kew Bull. 1920 : 109. 1920 ; Burkill in Rec. Bot. Surv. India 10 (2) : 289. 1925.

Herbs with polished leaves. Flowers pale pink or white, face obliquely downwards.

*Fl. & Fr.* : January - April.

40th mile to Burma nata, 79124.

*Distrib.* : INDIA : Arunachal Pradesh. Endemic.

**Begonia barbata** Wallich ex DC. in DC. Prodr. 15 (1) : 348. 1864. *non* Kurz, 1877 ; Deb in Fl. Tripura 1 : 268. 1891.

Succulent herbs with short stem. Flowers pinkish white. Fruits capsule, recurved with a descending wings, hairy.

*Fl. & Fr.* : July - March.

M' Pen check gate, 83147.

*Distrib.* : INDIA : Arunachal Pradesh, Assam ; BANGLA DESH MYANMAR.

**Begonia cathcartii** Hook. f. & Thomson, Illu. Pl. Himal. t. 13. 1855 ; C.B. Clarke in Fl. Brit. India 2 : 646. 1879. *B. nemophila* Kurz in J. Asiat. Soc. Beng. 10 (2) : 108. 1877.

Small caulescent herbs, pink. Leaves long petioled, cordate ovate, pink, upper surface light green, lower purple pink. Flowers pink.

*Fl. & Fr.* : June - October.

21st km to Deban, 81112 ; Gandhigram, 85066.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR.

**Begonia hatacoa** Buch. Ham. ex D. Don, Prodr. Fl. Nep. 223. 1825. *Begonia rubro-venia* Hook. in Curtis Bot. Mag. Ser. 3:9, t. 4689. 1853 ; C.B. Clarke in Fl. Brit. India 2 : 645. 1879 ; Fisher in Rec. Bot. Surv. India 12 (2) 98. 1938.

Succulent herbs. Leaves 6 - 17 x 1 - 5 cm, elliptic or lanceolate, rounded to sub-cordate at base, acule to acuminate. Flowers ca 1.8 cm across, white or pinkish - white, axillary, few flowered. Capsules ca 2 cm long, recurved, reddish.

*Fl. & Fr.* : July - February.

On the way to Vijoynagar, 99551 ; Bulbulia, 99568 ; Wakro to Glao lake, 99510.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN.

**Begonia iridescens** Dunn in Kew Bull. 1920 : 168. 1920 ; Burkill in Rec. Bot. Surv. India 10 (2) : 289. 1925.

Herbs with two large blue green iridescent leaves, which lie against the rocks, rarely a third small leaf is also present at the base of inflorescence ; the large leaf ca 40 cm in length. Flowers pink, slightly hooded.

*Fl. & Fr.* : January - April.

N.E. Gandhigram, 87917.

*Distrib.* : INDIA : Arunachal Pradesh, Endemic.

**Begonia obversa** C.B. Clarke in J. Linn. Soc. 25 : 26. 1889 ; Deb in Bull. Bot. Surv. India 3 : 285. 1961. *B. picta* Smith, Exot. Bot. 2 : 81. t. 101. 1805 ; Kanjilal *et al.*, Fl. Assam 2 : 334. 1938.

Small herbs ; root stock tuberous. Leaves ovate, cordate acuminate, finely serrate. Flowers unisexual ; ovary densely hairy. Capsule with one wing.

*Fl. & Fr.* : July - October.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya, Endemic.

**Begonia palmata** D. Don, Prodr. Fl. Nep. 223. 1825 ; Balakr., Fl. Jowai 1 : 215. 1981. *B. laciniata* Roxb., Fl. Ind. 3 : 649. 1832.

Lisu. : *Gacnu*.

Small delicate herbs. Inflorescence single, axillary or terminal, 2 - 6 flowered. Flowers red with whitish tinge. Fruits oblong, 3 - winged, capsules.

*Fl. & Fr.* : June - January.

Salt lick forest, Miao, 83568 ; Gandhigram, 82400, 78726 ; 77th mile to Gandhigram, 99595 ; Thumba to Panikheti, 99512.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL., MYANMAR, CHINA.

**Begonia roxburghii** (Miq.) A.D.C., Prodr. 15 (1) : 398. 1864 ; Balakr., Fl. Jowai 1 : 217. 1981. *Diploclinium roxburghii* Miq., Fl. Ind. Bot. 1 : 692. 1856. *Begonia malabarica* Roxb., Fl. Ind. ed. 3 : 648. 1832, *non* Lam., 1785.

Erect herbs. Inflorescence compound, umbellate cyme. Flowers yellowish white. Fruits 4 - lobed pendant capsule.

*Fl. & Fr.* : May - October.

40th mile forest, 79125, 79184 ; Salt lick forest, 83554 ; 27th mile forest, 87885 ; Deban, 99412.

*Distrib.* : INDIA : West Bengal, Sikkim, North east India ; NEPAL, MYANMAR.

**Begonia silhetensis** C.B. Clarke in Fl. Brit. India 2 : 636. 1879.

Herbs with short rootstock, thick, hairy all over. Leaves broadly ovate, finely denticulate. Flowers 1 - 7 on long scape, white ; sepals with red soft hairs.

*Fl. & Fr.* : October - January.

21st mile, M.V. road, 86663.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya. Endemic.

## APIACEAE

**Centella asiatica** (L.) Urban in Mart., Bras. 11 : 207. t. 78. 1879 ; Balakr., Fl. Jowai 1 : 218. 1981. *Hydrocotyle asiatica* L., Sp. Pl. 234. 1753.

Hindi : *Brahmi*.

Perennial herbs. Inflorescence in umbellate heads or solitary. Flowers red. Fruits laterally compressed.

*Fl. & Fr.* : April - November.

40th mile to Burma nala, 79114 ; 22 kms from Burma nala, 87661.

*Distrib.* : INDIA : Throughout tropical & Sub - tropical regions of India ; Pantropics.

**Oenanthe thomsonii** C.B. Clarke in Fl. Brit. India 2 : 697. 1879 ; Balakr., Fl. Jowai 1 : 220. 1981.

Much branched, glabrous herbs. Leaves pinnatifid. Flowers in axillary, terminal umbels or leaf opposed. Flowers white. Fruits compressed.

*Fl. & Fr.* : June - September.

Miao forest, 81135 ; 27th mile camp, 84944.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam ; NEPAL, MYANMAR.

**Hydrocotyle javanica** Thunb. Diss. Hydrocot. 3, t. 6. f. 2. 1798 ; Balakr., Fl. Jowai 1 : 218. 1981. *H. himalaica* P.K. Mukherjee in Indian For. 95 : 470. 1969.

Herbs with prostrate stems. Flowers in simple or irregular compound umbels, sub - orbicular.

*Fl. & Fr.* : May - October.

22 km from Deban, 83523.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam ; NEPAL, BHUTAN.

**Sanicula elata** Buch. Ham. ex D. Don. Prodr. Fl. Nep. 183. 1825 ; Balakr., Fl. Jowai 1 : 118. 1981. *S. europaea* non L., 1753 ; C.B. Clarke in Fl. Brit. India 2 : 670. 1879 ; Kanjilal *et al.*, Fl. Assam 2 : 340. 1938.

Erect herbs. Leaves 3 - 8 x 0.5 - 1.5 cm, orbicular, palmately 3 - 5 partite. Flowers small, white, in compound umbels. Fruits echinate, densely covered with bristles.

*Fl. & Fr.* : July-October.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; AFRICA, NEPAL, MYANMAR, THAILAND, INDO-CHINA, SUMATRA.

### ARALIACEAE

*Aralia armata* (G. Don) Seem. in J. Bot. 6 : 134. 1868 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 428. 1985. *Panax armatus* G. Don, Gen. Syst. 3 : 386. 1834.

Small trees or shrubs. Flowers in terminal panicles, 2 - 5 mm across, whitish or greenish - yellow. Fruits deeply 5 - angled, purplish - black.

*Fl. & Fr.* : September - February.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Aralia thomsonii* Seem. in J. Bot. 6 : 134. 1868 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 429. 1985.

Large shrubs, young parts tomentose. Flowers in umbels, 10 - 15 flowered, 2 - 3 mm across, white or greenish yellow. Fruits deeply 5 angled.

*Fl. & Fr.* : April - September.

Burma nala, 87660.

*Distrib.* : INDIA : Eastern Himalaya. Endemic.

*Brassalopsis glomerulata* (Blume) Regl., Gaertn Fl. 12 : 275. t. 411. 1863 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 430. 1985. *Aralia glomerulata* Blume, Bijdr. 872. 1826.

Asm. : Kurila.

Shrubs or small trees. Leaflets 7 - digitate. Panicles terminal. Flowers ca 6 mm across, white in racemose umbels. Fruits globose.

*Fl. & Fr.* : May - February.

Pangsu Pass, 81232 ; 26th mile, M.V. road, 86683.

*Distrib.* : INDIA : North - east India ; CHINA, SOUTH - EAST ASIA.

**Brassaiopsis hainla** (Buch.-Ham. ex D. Don) Seem. in J. Bot. 2 : 191. 1864 ; C.B. Clarke in Fl. Brit. India 2 : 735. 1879 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 191. 1979. *Hedera hainla* Buch. - Ham. ex. D. Don, Prodr. Fl. Nep. 187. 1925.

Small trees or large shrubs with tomentose young parts. Inflorescence on long panicles. Fruits globose, 1 - seeded.

*Fl. & Fr.* : February - October.

Salt lick forest Miao, 83575 ; Near Tulung Kunung, 87974.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, CHINA.

**Macropanax undulatus** (Wallich ex G. Don) Seem. in J. Bot. 2 : 294. 1864 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 436. 1985. *Hedera undulata* Wallich ex G. Don, Gen. Syst. 3 : 394. 1834.

*Asm.* : *Bon Keseru*.

Trees ca 20 m high ; crown dense. Flowers in terminal panicles, greenish - yellow, 4 mm across. Fruits ellipsoid, ca 6 mm.

*Fl. & Fr.* : June - February.

15th mile, M.V. road, 85192 ; 10th mile camp 87743.

*Distrib.* : INDIA : North - east India ; BHUTAN, BANGLA DESH, MYANMAR.

**Pseudobrassaiopsis hispida** (Seem.) R.N. Banerjee in J. Bombay Nat. Hist. Soc. 72 : 72. 1975 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 438. 1985. *Brassaiopsis hispida* Seem. in J. Bot. 2 : 292. 1864.

Prickly shrubs to small trees. Flowers in prickly panicles, ca 0.3 cm across, greenish white. Fruits sub - globose, obtusely 10 angled.

*Fl. & Fr.* : February - August.

Pakhan to Dollua, 99522.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Schefflera venulosa** (Wight & Arn.) Harms in Engler & Prantl, Pflanzenfam. 3(8) 39. 1894 ; Haridasan & Rao, For. Fl. Meghalaya 1 : 440. 1985. *Paratropia venulosa* Wight & Arn., Prodr. 1 : 377. 1834. *Heptapleurum venulosum* (Wight & Arn.) Seem. in J. Bot. 3 : 80. 1865 ; C.B. Clarke in Fl. Brit. India 2 : 729. 1879, p.p.

*Asm.* : *Dhoralota*.

Sub - scandent or climbing shrubs. Petiolules swollen at both ends.



Flowers in terminal umbellate spikes, yellowish green to white. Fruits fleshy, yellow.

*Fl. & Fr.* : March - November.

Miao forest, 79222 ; Krosam to Shirang, 88056 ; Deban forest, 98171.

*Distrib.* : INDIA : North - east India ; CHINA, VIETNAM.

*Schefflera wallichiana* (Wight & Arn.) Harms in Engler & Prantl, *Pflanzenfam* 3(8) : 39, 1894 ; Balakr., *Fl. Jowai* 1 : 224, 1981. *Paratropia wallichiana* Wight & Arn., *Prodr.* 337, 1834. *Heptapleurum wallichianum* (Wight & Arn.) Seem, *Rev. Heder.* 44 : 1868 ; C.B. Clarke in *Fl. Brit. India* 2 : 730, 1879. *H. khasianum* C.B. Clarke in *Fl. Brit. India* 2 : 730, 1879 ; Kanjilal *et al.*, *Fl. Assam* 2 : 352, 1938. *Schefflera khasiana* (C.B. Clarke) Vig. in *Ann. Sci. Nat. Bot.* 9 : 351, 1909.

Sub-scandent shrubs up to 3 m high. Leaflets 7 - 9, lanceolate or oblong - lanceolate, 14 - 20 x 5 - 8 cm, rounded or narrowed at base, acute to acuminate. Flowers ca 6 mm across, reddish - white, in subterminal spreading panicles.

*Fl. & Fr.* : October - March.

40th Mile forest, 99579.

*Distrib.* : INDIA : Sikkim, North east & South India ; SRI LANKA.

*Trevesia palmata* (Roxb.) Vis. in *Mem. Acad. Torin.* 2, 4 : 262, 1842 ; C.B. Clarke in *Fl. Brit. India* 2 : 732, 1789 ; Kanjilal *et al.*, *Fl. Assam* 2 : 363, 1938. *Gastonia palmata* Roxb., *Fl. Ind.* 2 : 407, 1824.

Small trees or large shrubs up to 5 m high. Leaves 25 - 40 cm across, orbicular, deeply palmatisect into 3 - 9 lobed, cordate or truncate at base, acuminate. Flowers greenish or yellowish - white, in sub - dichotomous branched panicles. Fruits ca 1 cm, subglobose.

*Fl. & Fr.* : January - July.

Gandhigram, 99656.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA, MALAYA.

#### ALANGIACEAE

*Alangium chinense* (Lour.) Harms in *Ber. Deuts. Bot. Ges.* 15 : 24, 1897 ; Haridasan & Rao, *For. Fl. Meghalaya* 1 : 446, 1985. *Stylidium*

*chinense* Lour., Fl. Cochinch. 220, 1790. *Marlea begoniaefolia* Roxb., Pl. Cor. 3 : 80. t. 203. 1819 ; C.B. Clarke in Fl. Brit. India 2 : 743. 1879.

Asm. : *Chika arnrulia*.

Small trees, with grey warty bark. Flowers in cymes, up to 6 cm long, *Flowers ca* 2.1 cm long, white, narrow. Fruits drupe, dark purple when ripe.

*Fl. & Fr.* : April - October.

Miao forest, 81132 ; Deban forest, 85070.

*Distrib.* : INDIA : North - east India ; INDO - MALAYA, AFRICA.

### CAPRIFOLIACEAE

*Lonicera macrantha* (D. Don) Sprengel, Syst. Veg. 4(2) : 82. 1827 ; Deb, Fl. Tripura 1 : 199. 1981. *Caprifolium macranthum* D. Don, Prodr. Fl. Nep. 140. 1825.

Climbing shrubs. Leaves cordate, hairy all over. Flowers in terminal panicles, white.

*Fl. & Fr.* : April - July.

40th mile forest, 87927.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Notes.* : This plant is of great horticultural value for its fragrant flowers.

*Viburnum colebrookianum* Wallich ex DC., Prodr. 4 : 325. 1830 ; C.B. Clarke in Fl. Brit. India 3 : 5. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 4. 1939.

Shrubs up to 3 m tall. Leaves 10 - 20 x 3 - 6 cm, broadly elliptic, oblong - lanceolate, obtuse or cuneate at base, acuminate at apex. Flowers *ca* 3 mm across, white, in umbels. Fruits ellipsoid, orbicular, red.

*Fl. & Fr.* : December - July.

Gandhigram, 99650.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, INDO-CHINA, TAIWAN.

*Viburnum corylifolium* Hook. f. & Thomson in J. Linn. Soc. 2 : 174. 1858 ; C.B. Clarke in Fl. Brit. India 3 : 3. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 3. 1939.

Shrubs ; branchlets and inflorescence hirsute. Leaves elliptic ovate, sub - cordate or rounded at base, acute. Flowers in corymbs, white. Fruits globose, bright red.

*Fl. & Fr.* : March - December.

26th mile, M. V. road, 86679.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Viburnum cylindricum** Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 142. 1825 ; Hara & Williams, Enum. Fl. Pl. Nepal 2 : 198. 1979. *V. coriaceum* Blume, Bijdr. 686. 1826 ; Balakr., Fl. Jowai 1 : 228, 1981. *V. capitellatum* Wight & Arn., Prodr. Fl. Ind. Or. 388. 1834.

Shrubs or small trees. Flowers in corymbose up to 8 cm across, thinly pubescent, creamy white. Fruits ellipsoid drupe, bluish black.

*Fl. & Fr.* : July - December.

Lati river, 87968 ; P. Kund, 96351.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, MYANMAR, SRI LANKA, THAILAND, CHINA, MALAYSIA.

**Viburnum foetidum** Wallich, Pl. Asiat. Rar. 1 : 49. t. 61. 1830 ; C.B. Clarke in Fl. Brit. India 3 : 4 1880; Haridasan & Rao, For. Fl. Meghalaya 2 : 458. 1987.

Tall shrubs. Leaves rhomboid or elliptic - lanceolate, cuneate at base, acute. Flowers in corymbs, white. Fruits scarlet red.

*Fl. & Fr.* : June - October.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; MYANMAR.

### SAMBUCACEAE

**Sambucus javanica** Blume, Bijdr. 657. 1826 ; Balakr., Fl. Jowai 1 : 228. 1981.

*Asm.* : Hoklati.

Erect shrub, 1 - 4 m, sparsely branched. Flowers in corymbose. finally pubescent, yellowish white. Fruits ovoid, berries, black.

*Fl. & Fr.* : March - October.

M' Pen check gate, 83143, 83141.

*Distrib.* : INDIA : North - east India ; MYANMAR, JAVA.

## RUBIACEAE

**Anthocephalus chinensis** (Lam.) A. Rich. ex Walp., Repert. 2 : 491. 1843 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 466. 1987. *Cephalanthus chinensis* Lam., Encycl. Meth. Bot. 1 : 678. 1785. *Anthocephalus cadamba* Roxb. in Miq., Pl. Ind. Bot. 2 : 135. 1856 ; Hook. f., Fl. Brit. India 3 : 23. 1880.

Asm. : Roghu ; Hindi : Kadam.

Lofty trees, young parts lenticellate. Inflorescence in pendulous heads, yellow.

Fl. & Fr. : November - October.

Deban forest, 79066 ; Haldibari camp, 87717.

Distrib. : INDIA : Throughout India ; NEPAL, MYANMAR, SRI LANKA, CHINA, MALAYSIA.

**Borreria articularis** (L. f.) F.N. Williams in Bull. Herbs. Boiss. Ser. 2. 5 : 956. 1905 ; Balakr., Fl. Jowai 1 : 252. 1981. *Spermacoce articularis* L. f., suppl. 119. 1781. *Borreria hispida* (L.) K. Schum. in Engler & Prantl, Pflanzenfam. 4(4) : 144. 1891. (non Spruce ex K. Schum. 1888) ; Kanjilal *et al.*, Fl. Assam 3 : 93. 1939. *Spermacoce hispida* L., Sp. Pl. 102. 1753 ; Hook. f., Fl. Brit. India 3 : 200. 1881.

Procumbent hispid herbs ; branches 4 - angled. Flowers in axillary whorls, pale - purplish or whitish.

Fl. & Fr. : January - December.

Near Zero camp area, 84903.

Distrib. : INDIA : Throughout hilly regions of India ; NEPAL, SRI LANKA, CHINA, MALAYSIA.

**Canthium dicoccum** (Gaertner) Teys. & Binn. in Cat. Hort. Bogor. 113. 1866 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 468. 1987. *Canthium didymum* Roxb., Fl. Ind. 1 : 535. 1832 ; Hook. f., Fl. Brit. India 3 : 132. 1880.

Large shrubs with spreading branches ; bark warty and vertically fissured. Flowers in bud condition green.

Fl. & Fr. : April - December.

Near 10th mile point, 87777.

Distrib. : INDIA : Himalaya and South India ; NEPAL SRI LANKA, CHINA, MALAYSIA.

**Coffea benghalensis** Heyne ex Roem. & Schult. Syst. Veg. 5 : 200. 1819. *C. benghalensis* Roxb., Fl. Ind. 1 : 540. 1820 ; Hook. f., Fl. Brit. India 3 : 153. 1880 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 471. 1987.

Asm. : *Koithnaphul*.

Sub scandent shrubs. bark dark brown. Flowers terminal or axillary, white, fragrant.

*Fl. & Fr.* : February - November.

South bank of Noa- Dihing river near 20th mile, 85020.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BHUTAN, MYANMAR, MALAYA.

**Coffea khasiana** Hook. f., Fl. Brit. India 3 : 154. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 74. 1939.

Small trees ; young parts appressed hairy. Flowers greenish white. Young fruits green.

*Fl. & Fr.* : April - June.

Hornbill, 87701, 87709 ; 27th mile, M.V. road, 87847 ; P. Kund, 96358.

*Distrib.* : INDIA : North - east India at higher elevations.

**Damnacanthus indicus** Gaertner, Fl. Fruct. : 18. t. 182. 1805 ; Hook. f., Fl. Brit. India 3 : 158. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 30. 1939.

Small, rigid, spinous shrubs. Leaves sub sessile, ovate, acute, entire, glabrous. Flowers solitary axillary or in pairs, white. Drupe globose, orange.

*Fl. & Fr.* : July - March.

Kumon Bum, 78729.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; JAPAN.

**Galium asperifolium** Wallich ex Roxb., Fl. Ind. 1 : 381. 1820 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 473. 1987. *G. mollugo non. L.*, 1753 ; Hook. f., Fl. Brit. India 3 : 207. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 95. 1939.

Rambling herbs ; stems quadrangular, scabrous or recurved bristles. Flowers small, in cymes, whitish.

*Fl. & Fr.* : April - October.

27th mile forest area, 87881.

*Distrib.* : INDIA : (Throughout India) ; THAILAND, Sub - Tropics of ASIA And EUROPE.

**Hedyotis scandens** Roxb., Fl. Ind. 1 : 369. 1820 ; Hook. f., Fl. Brit. India 3 : 57. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 37. 1939.

*Asm.* : *Bhedelilst.*

Slender climbing undershrubs ; stems often purplish tinged. Flowers small, in cymes. Young fruits green.

*Fl. & Fr.* : August - April.

Kamat to Walap, 87968 ; Pangsung Pass forests, 88272 ; East of Gandhigram, 99645.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL., BHUTAN, BANGLA DESH, MYANMAR, CHINA.

**Hedyotis verticillata** (L.) Lam., Encycl. Meth. Bot. 1 : 271. 1791. *Oldenlandia verticillata* L., Mant. 1 : 40. 1767. *Hedyotis hispida* Retz., Obs 4 : 23. 1786 ; Hook. f., Fl. Brit. India 3 : 60. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 39. 1939.

Profusely branched under shrubs. Leaves margin recurved, acute. Flowers in clusters, axillary, white. Fruits hispid, ovoid capsule.

*Fl. & Fr.* : October - February.

Miao forest, 83107 ; Jairampur, 19925.

*Distrib.* : INDIA : Kashmir to North east India ; BHUTAN, BANGLA DESH, CHINA, MALAYA.

**Hyptienthera stricta** (Willd.) Wight & Arn., Prodr. 339. 1834 ; Hook. f., Fl. Brit. India 3 : 121. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 61. 1939. *Macrocnemum strictum* Willd. in Roem. & Schult. Syst. 5 : 6. 1820.

Tall shrubs or small trees ; bark reticulately fissured. Flowers sessile, in axillary cymes, white.

*Fl. & Fr.* : April - January.

Jairampur forest, 88754.

*Distrib.* : INDIA : Uttar Pradesh, Assam, Meghalaya, Sikkim, Arunachal Pradesh ; NEPAL., MYANMAR, CHINA.

**Ixora nigricans** R. Br. ex. Wight & Arn., Prodr. 428. 1834 ; Hook. f., Fl. Brit. India 3 : 148. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 70. 1939.

Tall shrubs ; bark greyish or dark brown. Flowers in lax paniculate cymes, greenish - white.

*Fl. & Fr.* : April - November.

Deban forest, 85056.

*Distrib.* : INDIA : North - east and South India ; MALAYA.

*Ixora subsessilis* G. Don, Sys. 3 : 572. 1834 ; Hook. f., Fl. Brit. India 3 : 139. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 68. 1939.

Small trees up to 10 m high ; bark grey or greyish brown. Flowers small, in corymbs, white with pink tinge. Fruits pinkish when ripe.

*Fl. & Fr.* : April - December.

Miao forest, 79170 & 79176 ; 40th mile forest, 87685 ; 27th mile, 86636 ; 32 km after Thumba, 96365.

*Distrib.* : INDIA : North - east India.

*Knoxia mollis* R. Br. in Wallich Cat. 820. 1828, (*nom. valid*) ; Mabblerley in Bot. & Hist. Hort. Malbaricus 85. 1980. *Knoxia sumatrensis* (Retz.) DC., Prodr. 4. 569. 1839 ; Balakr., Fl. Jowai 1 : 251. 1981. *Spermacece sumatrensis* Retz. Obe. 4 : 23. 1786. *Knoxia corymbosa* Willd., Sp. Pl. 1 : 582. 1789 ; Hook. f., Fl. Brit. India 3 : 128. 1880.

Erect herbs ; stems densely hairy all over. Flowers in corymbiform terminal panicles, white ; corolla 4 in number.

*Fl. & Fr.* : October - January.

10th mile forest, 85155.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; JAVA, SUMATRA.

*Lasianthus biermannii* King in Hook. f., Fl. Brit. India 3 : 190. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 93. 1939.

Tall shrubs. Leaves elliptic lanceolate to oblanceolate, ovate, cuneate at base, acuminate. Flowers in axillary peduncled cymes, pale blue. Fruits sub - globose, bluish.

*Fl. & Fr.* : March - December.

Gandhigram to Kumon Bum, 78764.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Lasianthus hookeri** C.B. Clarke & Hook. f., Fl. Brit. India 3 : 184. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 92. 1939.

Shrubs with horizontal branches ; lower surface of leaves strigose. Flowers sessile, white. Fruits sub - globose, green.

*Fl. & Fr.* : March - January.

31st mile forest, 87638.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Lasianthus lucidus** Blume, Bijdr. 997. 1826 ; Hook f., Fl. Brit. India 3 : 1980 ; Kanjilal *et al.*, Fl. Assam 3 : 91. 1939.

Shrubs up to 5 m high, branchlets green. Flowers sessile, white. Fruits globose, fleshy.

*Fl. & Fr.* : February - December.

Jairampur forest, 81197.

*Distrib.* : INDIA : North - east India ; MALAYA.

**Lasianthus Sikkimensis** Hook. f., Fl. Brit. India 3 : 180. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 90. 1939.

Under shrubs up to 4 m high ; stem and lower surface of leaves hairy. Flowers sessile, white.

*Fl. & Fr.* : April - October.

27th mile forest, 87890.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Lasianthus tubiflorus** Hook. f., Fl. Brit. India 3 : 183. 180 ; Kanjilal *et al.*, Fl. Assam 3 : 91. 1939.

Small spreading shrubs ; bark brown or dark brown. Flowers sessile, greenish white or pale purplish.

*Fl. & Fr.* : February - December.

Salt lick forest, Miao, 79169.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Luculia pinceana** Hook. in Curtis, Bot. Mag. Ser. 3. 1 : t. 4132. 1854 ; Hook. f., Fl. Brit. India 3 : 37. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 30. 1939.

Small trees ; bark brown or reddish brown. Flowers in axillary or



*Fl. & Fr.* : October - March.

Near Burma nala, 87654 ; Lati - valley, Kamlat - Walap, 88007.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

*Meyna spinosa* Roxb. ex Link, Jahrb. Bot. 1(3) : 32. 1820 ; Balakr., Fl. Jowai 1 : 239. 1981. *Vanguria spinosa* Roxb., Fl. Ind. 2 : 172. 1824 ; Hook. f., Fl. Brit. India 3 : 136. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 66. 1939. *Meyna laxiflora* Robyns, Bull. Jard. Bot. Brux. 11 : 228. 1829 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 486. 1987.

Middle sized trees with compact crown ; bark brown or deep grey. Flowers in axillary cymes, white. Fruits globose green.

*Fl. & Fr.* : April - December.

Left bank of Deban river, 85125.

*Distrib.* : INDIA : North east India ; MYANMAR, CHINA, MALAYA.

*Morinda angustifolia* Roxb., Fl. Corm. 3 (2) : 237. 1815 ; Hook. f., Fl. Brit. India 3 : 156. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 79. 1939.

Asm. : *Asu*.

Large shrubs ; bark reddish brown. Flowers in axillary cymes, white, fragrant. Fruits in clusters, bluish white.

*Fl. & Fr.* : February - October.

Miao forest, 81071.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR.

*Mussaenda glabra* Vahl, Symb. Bot. 3 : 38. 1790 ; Hook. f., Fl. Brit. India 3 : 90. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 44. 1939.

Asm : *Sorancopa*.

Scandent shrubs ; bark brown. Flowers in terminal cymes, yellow or orange. Fruits globose, red when mature.

*Fl. & Fr.* : May - December.

West of 40th mile, I.B. 87679.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; NEPAL, MYANMAR, CHINA, MALAYSIA.

**Mussaenda incana** Wallich in Roxb., Fl. Ind. 2 : 229. 1824 ; Hook. f., Fl. Brit. India 3 : 87. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 46. 1939. *M. pubescens* Buch. - Ham. in Wallich. Cat. 212, n. 6257. 1832, *nom. nud.*

Under shrubs, densely hairy. Flowers in corymbose cymes, pale yellow ; calyx foliaceous, cream or pale yellow or whitish.

*Fl. & Fr.* : May - October.

Salt lick forest, Miao, 81032.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; NEPAL.

**Mussaenda macrophylla** Wallich in Roxb., Fl. Ind. 2 : 228. 1824 ; Hook. f., Fl. Brit. India 3 : 89. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 45. 1939.

Erect or sub scandent, hirsute shrubs. Flowers in terminal compact cymes, orange - red. Young fruits yellowish green, mature red - blood coloured.

*Fl. & Fr.* : July - December.

Miao forest, 79199, 83558 ; Deban forest, 85042.

*Distrib.* : INDIA : North east India, Andamans ; NEPAL, MYANMAR, CHINA, PHILIPPINE.

**Mussaenda roxburghii** Hook. f., Fl. Brit India 3 : 87. 1880 ; Kanjilal *et al.*, Fl. Assam, 3 : 46. 1939.

*Asm.* : *Soklat.*

Small shrubs ca 1 m high. Flowers in terminal subcapitate cymes, yellow or orange - yellow, petaloid ; sepals oblong - lanceolate, white.

*Fl. & Fr.* : April - November.

Pangsu Pass forest, 81226 ; 26th mile 83540 ; Haldibari, 99424.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, BANGLA DESH.

**Mycetia longifolia** (Wallich) O. Ktze., Rev. Gen. 289. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 49. 1939. *Rendetelia longifolia* Wallich in Roxb., Fl. Ind. 2 : 137. 1824. *Vendlandia longifolia* (Wallich) DC., Prodr. 4 : 412. 1830. *Adnosacme longifolia* (Wallich) Hook. f., Fl. Brit. India 3 : 95. 1880.

Small shrubs up to 3 - 4 m high ; young parts pubescent. Flowers yellow in cymes. Fruits berry, white at maturity.

*Fl. & Fr.* : June - February.

M' Pen, 81022 ; Deban, 79013 ; 22 kms to Deban I.B., 83512 ; Glao lake, 99481.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim, Arunachal Pradesh, Assam ; MALAYSIA.

*Myrloneuron nutans* Kurz, For. Fl. Brit. Burma 2 : 55. 1877 ; Hook. f., Fl. Brit. India 3 : 96. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 50. 1939.

Erect shrubs ca 1 m high ; stems white. Flowers in terminal condensed corymbose cymes, orange yellow. Fruits saccate, globose, white.

*Fl. & Fr.* : July - March.

Miao forest, 79018 ; 40th mile forest, 79198 ; Haldibari, 99432.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

*Nauclea griffithii* Hav. in J. Linn. Soc. 33 : 51. 1979 ; Kanjilal *et al.*, Fl. Assam 3 : 19. 1939. *Adina griffithii* Hook. f., Fl. Brit. India 3 : 24. 1880.

Lofty trees ; bark grey or dark grey. Flower buds pinkish - white or purplish ; calyx white hairy.

*Fl. & Fr.* : September - February.

Burma nala forest, 87665.

*Distrib.* : INDIA : North - east India, Andaman.

*Ophiorrhiza argentea* (Hook. f.) Balakr., Fl. Jowai 1 : 247. 1981. *O. harrissiana* Heyne var. *argentea* Hook. f., Fl. Brit. India 3 : 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 42. 1939.

Small erect herbs, pubescent. Flowers in terminal cymes, white or pale pink. Capsule glabrous.

*Fl. & Fr.* : March - August.

Near 10th mile camp, 87758.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya, Nilgiris  
BANGLA DESH, SRI LANKA.

*Ophiorrhiza calcarata* Hook. f., Fl. Brit. India 3 : 84. 1880  
Kanjilal *et al.*, Fl. Assam 3 : 43. 1939.

Small shrubs ; creeping below. Bracteoles much shorter than the flowers. Flowers in cymes, white with pink tinge.

*Fl. & Fr.* : October - February.

Kamlat to Walap, 87983 ; Lati valley - Krosam, 88075.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

***Ophiorrhiza hispida*** Hook. f., Fl. Brit. India 3 : 83. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 42. 1939.

Erect or procumbent herbs, densely hairy. Leaves dull green, hirsute. Flowers in terminal capitate cymes, greenish - white. Fruits hispid capsule.

*Fl. & Fr.* : April - October.

Jairampur forest, 81194.

*Distrib.* : INDIA : North east India.

***Ophiorrhiza succirubra*** King ex Hook. f., Fl. Brit. India 3 : 82. 1880 ; Deb, Fl. Tripura 2 : 75. 1983.

Herbs, erect, glabrous. Leaves elliptic lanceolate or elliptic - oblong, acute at base, acuminate. Flowers in terminal corymbose cymes, red purple. Fruits compressed.

*Fl. & Fr.* : June - October.

*Distrib.* : INDIA : West Bengal, Sikkim, North east India ; NEPAL, MYANMAR.

***Ophiorrhiza treutleri*** Hook. f., Fl. Brit. India 3 : 83. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 42. 1939.

Erect stout herbs, hairy. Stipules large, pubescent. Flowers in terminal cymes, greenish - brown. Fruits violet.

*Fl. & Fr.* : April - October.

Jairampur forest, 81185 ; 27th mile 86645.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL.

***Paederia foetida*** L., Mant. Pl. I : 52. 1767 ; Hook. f., Fl. Brit. India 3 : 195. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 77. 1939.

Asm. : *Paduri lata*.

Slender twiners. Leaves elliptic ovate or ovate lanceolate, rounded at base, acute or acuminate. Flowers in axillary and terminal paniculate cymes, white with light tinge and deep purplish throat. Fruits compressed, brownish.

*Fl. & Fr.* : June - December.

Miao to Deban road, 83106.

*Distrib.* : INDIA : Uttar Pradesh to North - east India ; MALAYA, PHILIPPINES, JAPAN.

***Paederia scandens*** (Lour.) Merr. in Contr. Arn. Arb. 8 : 163. 1934 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 464. 1987. *Gentiana scandens* Lour., Fl. Cochinch. 171. 1790. *Paederia tomentosa* Blume, Bijdr. 968. 1826 ; Hook. f., Fl. Brit. India 3 : 197. 1881.

Asm. : *Paduri lewa*.

Climbers or twiners. Stipules deciduous. Flowers in paniced cymes, pinkish white. Fruits orange.

*Fl. & Fr.* : October February.

West bank of Deban river, 85121.

Gandhigram, 99611.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA, JAPAN, MALAYSIA.

***Pavetta indica*** L., Sp. Pl. 110. 1753 ; Hook. f., Fl. Brit. India 3 : 150. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 72. 1939. *Ixora pavetta* Roxb., Fl. Ind. 1 : 395. 1820.

Asm. : *Sam - suku*.

Tall shrubs or small trees, bark greyish. Flowers in corymbose cymes, white or bluish - white. Fruits globose drupes, blackish - green.

*Fl. & Fr.* : May - November

Deban forest, 85046, 85083.

*Distrib.* : INDIA : North - east India ; NEPAL, MALAYA.

***Pavetta indica*** subsp. ***tomentosa*** (Roxb. ex J.E. Smith) Bennet, Fl. Howrah 356. 1979. *Pavetta tomentosa* Roxb. ex J.E. Smith in Rees., Cyclop. 26 : 2. 1819 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 496. 1987. *Ixora tomentosa* Roxb., Fl. Ind. 1 : 396. 1820. *Pavetta tomentosa* Roth, Nov. Fl. Ind. Or. 89. 1821. *P. indica* var. *tomentosa* (Roxb.) Hook. f., Fl. Brit. India 3 : 150. 1880.

Large shrubs ; bark brown with rough scales. Flowers in clusters, white globose, ink blue when ripe.

*Fl. & Fr.* : May - October.

M' Pen check gate, 81012 ; Miao forest, 81038 ; 81087.

*Distrib.* : INDIA : Throughout India, NEPAL, CHINA.

**Polyura geminata** Hook. f., *Icon. Pl. Ser.* 3 : 11 t. 1049. 1868 & *Fl. Brit. India* 3 : 77. 1880 ; Kanjilal *et al.*, *Fl. Assam* 3 : 41. 1939.

Herbs, with woody stems ; branching from the base. Flowers in axillary panicles of scorpioid cymes, white.

*Fl. & Fr.* : June - December.

Miao forest, 81085 ; Deban forest 85031, 85036 ; 22 - 32 km to Deban 83522.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Psychotria adenophylla** Wallich in Roxb., *Fl. Ind.* 2 : 166. 1824 ; Hook. f., *Fl. Brit. India* 3 : 164. 1880 ; Kanjilal *et al.*, *Fl. Assam* 3 : 82. 1939.

Shrubs, up to 3 m high. Leaves 7-13 x 2-7 cm, obovate or ovate-elliptic, cuneate at base, acuminate. Flowers ca 3 mm across, greenish-white, in long panicles. Fruits ca 7 mm in diam. globose-ellipsoid.

*Fl. & Fr.* : April - November.

*Distrib.* : INDIA : North-east India, Andaman ; MYANMAR.

**Psychotria calocarpa** Kurz in *J. Asiat. Soc. Beng.* 41 (2) : 315. 1872 ; Hook. f., *Fl. Brit. India* 3 : 173. 1880 ; Kanjilal *et al.*, *Fl. Assam* 3 : 83. 1939. *P. asiatica* non L. 1753 ; Roxb., *Fl. Ind.* 2 : 160. 1824.

Small shrubs ; young parts puberulous. Leaves variable with wavy margin. Flowers in cymes, yellowish-white. Fruits green when young turning yellow when ripe.

*Fl. & Fr.* : June - December.

32 km from Miao on the way to Deban, 83630 ; Deban forest, 85043 ; 27th mile forest, 86639 ; 40th mile forest, 87939 ; Dahu, 99526.

*Distrib.* : INDIA : North-east India ; NEPAL, BHUTAN.

**Psychotria denticulata** Wallich in Roxb., *Fl. Ind.* 2 : 166. 1824 ; Hook. f., *Fl. Brit. India* 3 : 173. 1880 ; Kanjilal *et al.*, *Fl. Assam* 3 : 83. 1939.

Large herbs or small shrubs, branchlets green. Flowers in terminal or axillary corymbosiform cymes, greenish or creamy-white.

*Fl. & Fr.* : May - December.

Salt lick forest, Miao, 81042 ; 22 - 32 km from Miao, 83623 ; On the way to Bulbulia. 99563.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; NEPAL, MYANMAR.

*Psychotria erratica* Hook. f., Fl. Brit. India 3 : 168. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 84. 1939.

Erect shrubs up to 3 m tall. Leaves 5 - 15 x 2 - 5 cm, elliptic - lanceolate, cuneate at base, acuminate at apex. Flowers *ca* 3 mm across, greenish - white. Fruit globose, red.

*Fl. & Fr.* : May - December.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN.

*Psychotria montana* Blume, Bijdr. 960. 1826 ; Hook. f., Fl. Brit. India 3 : 174. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 84. 1939.

Erect shrubs up to 0.5 m high. Leaves 8 - 20 x 2 - 4 cm, elliptic lanceolate, or oblanceolate, acute at base, caudate - acuminate at apex. Flowers in terminal or axillary subcorymbose cymes. White or greenish - yellow. Fruits *ca* 1 cm, sub - globose or ellipsoid.

*Fl. & Fr.* : May - December.

P. Kund, 99444.

*Distrib.* : INDIA : North-East India ; MYANMAR, BANGLA DESH, JAVA.

*Psychotria monticola* Kurz in J. Asiat. Soc. Beng. 2 : 315. 1872 ; Balakr., Fl. Jowai 1 : 241. 1981. *P. fulva* Hook. f., Fl. Brit. India 3 : 169. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 85. 1939.

Shrubs, *ca* 2 m tall. Leaves elliptic - lanceolate or ovate, cuneate at base, acuminate. Flowers in axillary or subterminal cymes, white. Fruits ellipsoid, reddish.

*Fl. & Fr.* : March - February.

North - east of Gandhigram 82392.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya ; MYANMAR.

*Psychotria silhetensis* Hook. f., Fl. Brit. India 3 : 174. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 841. 1939.

Shrubs. Leaves elliptic, oblong - elliptic, shortly acuminate, entire. Flowers in axillary or terminal, pedunculate cymes. Fruits globose or ellipsoid with prominent groove.

*Fl. & Fr.* : March - October.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ;  
BANGLA DESH.

*Psychotria symplucifolia* Kurz, For. Fl. Brit. Burma 2 : 11, 1877 ;  
Hook. f., Fl. Brit. India 3 : 172, 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 85,  
1939.

Shrubs or small trees ; bark greyish brown. Flowers in terminal or  
axillary trichomerous cymes, greenish white. Fruits globose berry.

*Fl. & Fr.* : April - October.

Nampong forest, 81208 ; South bank of Noa Dihing river near 20th  
mile, 85019 ; Krosam, 88078.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Randia cochinchinensis* (Lour.) Merr. in Trans. Amer. Phil. Soc.  
Ser. 2, 24(2) : 365, 1935 ; Balakr., Fl. Jowai 1 : 234, 1981. *Aidia*  
*cochinchinensis* Lour., Fl. Cochinch. 143, 1790. *R. densiflora* (Wallich)  
Benth; Hook. f., Fl. Brit. India 3 : 112, 1880 ; Kanjilal *et al.*, Fl. Assam  
3 : 60, 1939.

Small trees. Leaves lanceolate or elliptic - oblong, acute at base,  
acuminate. Flowers in leaf - opposed cymes, white. Fruits globose, black.

*Fl. & Fr.* : February - September.

Kumon Bum, 78708.

*Distrib.* : INDIA : North - east India, Andaman Islands ; BANGLA  
DESH, MYANMAR, SINGAPORE, AUSTRALIA, MALAYSIA.

*Randia fasciculata* (Roxb.) DC., Prodr. 4 : 386, 1830 ; Hook. f.,  
Fl. Brit. India 3 : 109, 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 59, 1939.  
*Gardenia fasciculata* Roxb.

*Asm.* : Pulikaint.

Shrubs with short axillary spines ; bark greyish warty. Flowers in  
long terminal cymes, yellowish - white.

*Fl. & Fr.* : May - December.

Miao forest, 81078 ; 22 km to Deban I.B., 83521.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ; NE-  
PAL, BHUTAN, MYANMAR.

*Rubia cordifolia* L., Sp. Pl. 397, 1753 ; Hook. f., Fl. Brit. India 3 :  
202, 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 94, 1939.



Asm. *Lining - ru.*

Scabrid climbers. Stipules foliaceous. Flowers in much branched panicles, greenish - yellow or yellowish. Fruits black berry.

*Fl. & Fr.* : July - January.

Tulung - Kunung, 87961.

*Distrib.* : INDIA : Throughout India ; AFRICA, ASIA.

**Rubia sikkimensis** Kurz in J. Asiat. Soc. Beng. 43(2) : 188. 1874 ; Hook. f., Fl. Brit. India 3 : 203. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 94. 1939.

Scandent herbs or climbers ; stem quadrangular. Flowers in panicled cymes. Fruits globose, small, green.

*Fl. & Fr.* : September - February.

Krosam to Shirong, 88044 ; 77 to 85 mile, M.V. road, 99603.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur ; NEPAL.

**Saprosma ternatum** Hook. f., Gen. Pl. 2 : 131. 1873 & Fl. Brit. India 3 : 193. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 88. 1939.

Asm. : *Bedeligach.*

Small trees ; bark greyish - brown. Flowers in cymes, greenish white ; young fruits globose, green, pulpy.

*Fl. & Fr.* : May - November.

Miao forest, 81093 ; Nampong forest, 81212 ; East of Deban I.B. 85069 ; 29th mile forest, 86611 ; 10th mile camp, 87742.

*Distrib.* : INDIA : North - east India, Andaman ; MYANMAR.

**Silvianthus bracteatus** Hook. f., Fl. Brit. India 3 : 86. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 43. 1939.

Glabrous shrubs, young parts often rusty hairy. Flowers in axillary or terminal cymes, purplish ; calyx purplish, prominent. Fruits with calyx ; seeds black.

*Fl. & Fr.* : March - October.

Miao forest, 81057, 83123 ; Salt lick forest, 85199.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

**Spiradiclis bifida** Wallich ex Kurz in J. Asiat. Soc. Beng. 2 : 311.

1872 ; Hook. f., Fl. Brit. India 3 : 76. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 41. 1939.

Herbs delicate. Flowers small in dichotomous paniced cyme, palish - creamy or white, opening one by one.

*Fl. & Fr.* : June - February.

Miao forest 79094, 81094 ; Salt lick forest, 81040 ; 27th mile forest, 86640 ; on way to Bulbulia, 99569 ; 40th mile M.V. road, 99580.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Tripura, Meghalaya.

*Spiradiclis cylindrica* Hook. f., Fl. Brit. India 3 : 76. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 41. 1939.

Herbs creeping. Flowers in simple or forked cymes. white or pale purplish ; seeds reddish brown.

*Fl. & Fr.* :- May - November.

Deban forest, 85033, 85040.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

*Tarenna disperma* (Hook. f.) Pitard in Lecomte Fl. Gen. Indo - China 3 : 208. 1923. *Webera disperma* Hook. f., Fl. Brit. India 3 : 102. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 52. 1939.

Shrubs or small trees. Flowers in shortly peduncled pubescent cymes. Fruits globose berry, hard, 2 - seeded.

*Fl. & Fr.* : May - December.

16th mile forest, 85170 ; 29th mile forest, 86609.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ; BANGLA DESH.

*Uncaria macrophylla* Wallich in Roxb., Fl. Ind. 2 : 132. 1824 ; Hook. f., Fl. Brit. India 3 : 32. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 23. 1939.

Asm. : *Barusilata*.

Large woody climbers ; young parts rusty tomentose. Flowers in heads, green. Fruits linear ellipsoid capsule.

*Fl. & Fr.* : September - March.

Salt lick forest, Miao, 85004 ; Pangsung Pass forest, 88267 ; Nampong forest, 88731.

*Distrib.* : INDIA : North - east India ; BHUTAN, BANGLA DESH.

*Uncaria sessilifructus* Roxb., Fl. Ind. 1 : 520. 1820 ; Hook. f., Fl. Brit. India 3 : 30. 1880 ; Kanjilal *et al.*, Fl. Assam 3 : 24. 1939.

*Asm.* : *Borkhilata*.

Extensive climbers with curved axillary hooks ; bark brownish. Flowers in axillary or terminal paniced heads, yellowish with sweet smell.

*Fl. & Fr.* : September - March.

22 km to Deban I.B., 83543 ; North of Zero camp, 85185 ; 26th mile forest, 86680, 90336 ; Gandhigram, 99613.

*Distrib.* : INDIA : North - east India ; MALAYA.

*Wendlandia grandis* (Hook. f.) Cowan in Not. R. Bot. Gard. Edinb. 16 : 261. t. 233. f. 6. 1932 ; Kanjilal *et al.*, Fl. Assam 3 : 36. 1939. *W. tinctoria* DC. var. *grandis* Hook. f., Fl. Brit. India 3 : 38. 1880.

Middle sized trees, bark greyish brown. Flowers in panicles, rusty tomentose, young buds greenish, corolla pilose inside. Fruit capsule.

*Fl. & Fr.* : January - October.

Moti Jheel, 87727 ; Burma nala, 87664 ; Krosam to Shirong, 88047, 88986 ; Gandhigram, 97471.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR.

*Wendlandia tinctoria* (Roxb.) DC., Prodr. 4 : 411. 1830 ; Deb, Fl. Tripura 2 : 88. 1983. *Rondeletia tinctoria* Roxb., Fl. Ind. 2 : 134. 1824. *Wendlandia tinctoria* DC. var. *normalis* Hook. f., Fl. Brit. India 3 : 38. 1880.

*Asm.* : *Gauni - kewta*.

Small trees ; bark ash coloured. Flowers in pyramidal panicles, white, pubescent ; corolla lobes shorter than fruits. Fruit capsule, reddish brown.

*Fl. & Fr.* : November - April.

39th mile, M.V. road, 87627.

*Distrib.* : INDIA : Throughout India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

## CARLEMANNIACEAE

**Carlemannia griffithii** Benth. in Hook. J. Bot. Kew. Gard. Misc. 5 : 308. 1853 ; Hook. f., Fl. Brit. India 3 : 85. 1880.

Tall weak herbs. Leaves membranous, serrate, acute. Flowers white in clustered cymes.

*Fl. & Fr.* : December - February.

M' Pen check gate, 83145, Deban forest, 88659.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR.

## VALERIANACEAE

**Valeriana jatamansii** Jones in As. Res. 2 : 405 & 416. 1790. *Valeriana wallichii* D.C., Prodr. 640. 1830 ; C. B. Clarke in Fl. Brit. India 3 : 213. 1880. *Nardostachya jatamansi* (Jones) DC., Prodr. 4 : 625. 1830. *quoad basionym.*

Small herbs, pubescent. Leaves radical forming rosette. Flowers in panicles, dense - flowered, white.

*Fl. & Fr.* : February - August.

Shirong to Hunung, 88093.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BHUTAN, MYANMAR, CHINA, AFGHANISTAN.

## ASTERACEAE

**Ageratum conyzoides** L., Sp. Pl. 839. 1753 ; Hook. f., Fl. Brit. India 3 : 243. 1881 ; Balakr., Fl. Jowai 1 : 258. 1981.

Tall herbs ca 1 m high, hairy. Flowers in terminal dense corymbs, white. Fruits achene, blackish - brown.

*Fl. & Fr.* : Throughout the year.

Nampong forest open place, 88689.

*Distrib.* : INDIA : Throughout India ; Native of Tropical AMERICA.

*Ainsliaea latifolia* (D. Don) Sch. - Bip. in Pollichia 18 - 19 : 169. 1861 ; Balakr., Fl. Jowai 1 : 264. 1981. *Liatris latifolia* D. Don, Prodr. Fl. Nep. 169. 1825. *Ainsliaea pteropoda* DC., Prodr. 7 : 14. 1838 ; Hook. f., Fl. Brit. India 3 : 388. 1881.

Shrubs or tall herbs. Leaves radical, ovate or lanceolate, cordate, winged petiole. Flowers in fascicled heads, yellowish - white, involucrel bracts, reddish - green.

*Fl. & Fr.* : January - December.

Kamlat to Walap, 87987.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North eastern India ; BHUTAN, MYANMAR.

*Artemisia nilagirica* (C.B. Clarke) Pamp. in Nuov. Giorn. Ital. *n.s.* 33 : 452. 1926 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 518. 1987. *A. vulgaris* var. *nilagirica* C.B. Clarke, Comp. Ind. 162. 1876. *A. vulgaris* non L. 1753 ; Hook. f., Fl. Brit. India 3 : 325. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 119. 1939.

*Asm.* : Nilum.

Erect aromatic under shrubs ; young parts tomentose. Flowers on ovoid heads, solitary or fascicled, yellowish - white.

*Fl. & Fr.* : October - March.

Deban forest, 83587 ; Shrirong to Hunung 88202 ; Gandhigram, 99623.

*Distrib.* : INDIA : Throughout India ; MALAYA.

*Bidens biternata* (Lour.) Merr. & Scherff ex Scherff in Bot. Gez. 88 : 203. 1929 ; Deb, Fl. Tripura 2 : 204. 1983. *Coreopsis biternata* Lour., Fl. Cochinch. 508. 1790. *Bidens pilosa* L. var. B L. Syst. Nat. ed. 12. 2 : 534. 1767.

Small herbs, with biternate leaves. Flowers on long corymbosely paniced heads, white.

*Fl. & Fr.* : December - June.

Deban forest, 88662.

*Distrib.* : INDIA : Throughout India ; VIETNAM, MALAYSIA.

**Bidens pilosa** L., Sp. Pl. 832. 1753 ; Hook. f., Fl. Brit. India 3 : 309. 1881 ; Joseph, Fl. Nongpoh 163. 1981.

Small perennial herbs, scandent. Leaves opposite, variable in shape and size, trifoliate or trilobate. Flowers in heads ; ray floret white ; disc floret yellow.

*Fl. & Fr.* : July - December.

22 km to Deban, 83511.

*Distrib.* : INDIA : Throughout India ; Pantropics.

**Blumea lanceolaria** (Roxb.) Druce in Report. Bot. Exch. Club. Brit. Isles. 4 : 609. 1917 ; Joseph, Fl. Nongpoh, 160. 1981. *Conyza lanceolaria* Roxb., Fl. Ind. 3 : 432. 1832. *Blumea myriocephala* DC., Prodr. 5 : 445. 1836 ; Hook. f., Fl. Brit. India 3 : 269. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 112. 1939.

Tall, erect herbs or small shrubs, puberulous. Leaves 8 - 23 × 2 - 6 cm, oblanceolate to obovate, cuneate at base, acuminate, serrulate. Flowers in heads, clustered on elongated tomentose, erect panicles. Cypsela ribbed, hairy, reddish.

*Fl. & Fr.* : October - February.

Deban forest, 83625.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR.

**Blumea procera** DC., Prodr. 5 : 445. 1836 ; Hook. f., Fl. Brit. India 3 : 268. 1881.

Herbs up to 1.5 m high. Leaves sub-sessile, 5 - 15 × 2 - 6 cm, elliptic, oblong or oblanceolate, cuneate at base, acute. Heads 5 - 8 mm diam., in terminal large panicles. Involucral bracts linear oblong, acute.

*Fl. & Fr.* : December - October.

On the way to Vijoy Nagar, 99558 ;

Gandhigram, 99616.

*Distrib.* : INDIA : Sikkim, North-east India ; NEPAL, MYANMAR, BANGLA DESH, CHINA.

**Chromolaena odorata** (L.) King & Robinson in *Phyto*, 20 : 204, 1970 ; Hook. f., *Fl. Brit. India* 3 : 244, 1881 ; Kanjilal *et al.*, *Fl. Assam* 3 : 108, 1939. *Eupatorium odoratum* L., *Sp. Pl.* 862, 1753.

Under shrubs or shrubs. Flowers many in tri-chotomous convex corymbs, pale blue or white.

*Fl. & Fr.* : November - April.

Deban forest, 88300.

*Distrib.* : INDIA : Throughout India ; Native of Central and South AMERICA.

**Erigeron bonariensis** L., *Sp. Pl.* 863, 1753 ; Burt in *Kew Bull.* 1948 : 371, 1948 ; Balakr., *Fl. Jowai* 1 : 264, 1981. *E. linifolius* Willd. ; Hook. f., *Fl. Brit. India* 3 : 254, 1881.

Tall herbs, densely hirsute. Leaves linear lanceolate, cuneate at base, acuminate, obscurely serrate. Flowers in paniced heads, pinkish white ; pappus yellowish.

*Fl. & Fr.* : February - October.

Kamlat to Krosam, 88015.

*Distrib.* : INDIA : North-east India ; Pantropic weed of AMERICAN origin.

**Gnaphalium pensylvanicum** Willd., *Enum. Berol.* 867, 1809 ; Balakr., *Fl. Jowai* 1 : 227, 1981. *G. purpureum non* L., 1753 ; Hook. f., *Fl. Brit. India* 3 : 289, 1881.

Erect, stout herbs up to 75 cm high, branching from base, densely white, appressed woolly. Flowers in heads, reddish ; heads cylindrical, ca 4 mm in diam., sessile in clusters. Fruits dark brown achenes, ca 8 mm with pappus, hairs yellowish.

*Fl. & Fr.* : April - October.

39th mile, M.V. road, 86629.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Arunachal Pradesh, Meghalaya ; AMERICA.

**Gynura cusimbua** (D. Don) S. Moore in J. Bot. 50 : 212. 1912 ; Balakr., Fl. Jowai 1 : 270. 1981. *Cacalia cusimbua* D. Don, Prodr. Fl. Nep. 179. 1825. *Gynura angulosa* DC., Prodr. 6 : 298. 1838 ; Hook. f., Fl. Brit. India 3 : 334. 1881.

Large succulent herbs. Flowers in large terminal paniced heads, orange yellow, turning maroon at maturity.

*Fl. & Fr.* : October - March.

Krosam, 88080 ; Gandhigram, 99632.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; MYANMAR, MALAYSIA.

**Inula cappa** (D. Don) DC., Prodr. 5 : 469. 1836 ; Hook. f., Fl. Brit. India 3 : 295. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 116. 1939. *Conyza cappa* D. Don, Prodr. Fl. Nep. 176. 1825.

Tall herbs or small shrubs, 1 - 2 m high. Leaves 8 - 12 x 2 - 3 cm, oblong - lanceolate, acute or rounded at base at apex. Flowers in terminal or upper axillary paniced heads, yellowish.

*Fl. & Fr.* : October - April.

P. Kund, 99440.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India ; NEPAL, BHUTAN, CHINA, THAILAND, JAVA.

**Mikania micrantha** Kunth in H. B. K., Nor. Gen. Pl. 4 : 134. 1820 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 524. 1987.

Extensive twiners ; branches slender hairy. Flowers in terminal or axillary corymbose heads, white or creamy - white.

*Fl. & Fr.* : December - March.

Deban forest, 88652.

*Distrib.* : INDIA : Throughout India, Native of Tropical AMERICA.

**Myriactis nepalensis** Less. in Linnaea 6 : 128. t. 2. f. 1831 ; Hook. f., Fl. Brit. India 3 : 247. 1881. *M. wallichii* Less. ; Hook. f., Fl. Brit. India 3 : 247. 1881.

Erect herbs, glabrous or hispid. Leaves lanceolate, serrate. Flowers in sub - paniculate heads. Achenes mucronate, not beaked.

*Fl. & Fr.* : September - November.



Miao to Deban road, 83671.

*Distrib.* : INDIA : Kashmir to Arunachal Pradesh ; CHINA, THAILAND, IRAN, AFGHANISTAN.

*Prenanthes scandens* Hook. f. & Thomson ex C.B. Clarke, *Ceroop*, in DC., 274, 1876 ; Hook. f., *Fl. Brit. India* 3 : 413, 1881.

Tall flaccid climbing herbs, with zig-zag stem and branches. Flowers in axillary or terminal heads, pinkish white or white.

*Fl. & Fr.* : October - March.

Kamlat to Walap, 87981 ; on the way to Glao lake, 99490.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh.

*Senecio cappa* Buch. - Ham. ex D. Don, *Prodr. Fl. Nep.* 179, 1825 ; Balakr., *Fl. Jowai* 1 : 267, 1981. *S. densiflorus* Wallich in DC., *Prodr.* 6 : 369, 1838 ; Hook. f., *Fl. Brit. India* 3 : 335, 1881 ; Kanjilal *et al.*, *Fl. Assam* 3 : 123, 1939.

Erect under shrubs, white tomentose. Flowers in axillary and terminal paniced corymbose heads, white or yellowish white.

*Fl. & Fr.* : October - March.

Kamlat to Walap, 87992.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR.

*Senecio scandens* Buch. - Ham. ex D. Don, *Prodr. Fl. Nep.* 178, 1825 ; Hook. f., *Fl. Brit. India* 3 : 352, 1881 ; Kanjilal *et al.*, *Fl. Assam* 3 : 122, 1939.

Large woody climbers. Leaves 2 - 10 x 1 - 3 cm, ovate - hastate, triangular, acute or obtuse at base, acute or acuminate, petioles auricled. Flowers yellowish, in dense axillary corymbs. Achenes 4 - angled, white.

*Fl. & Fr.* : October - February.

Glao lake, 99475 ; Gandhigram, 99607.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North-east and South India ; MAYANMAR, SRI LANKA, THAILAND, CHINA, PHILIPPINES, JAPAN.

*Senecio wightii* (DC.) C.B. Clarke, *Comp. Ind.* 204, 1876 ; Balakr., *Fl. Jowai* 1 : 268, 1981. *Doronicum wightii* DC. in Wight, *Contrib. Bot. India* 23, 1834. *Senecto saxatilis* Wallich ex DC. ; Hook. f., *Fl. Brit. India* 3 : 344, 1881.

Herbs. Leaves elliptic - oblong, oblong, auricled at base, acute or acuminate. Flowers in paniculate, corymbose heads, yellowish ; pappus reddish.

*Fl. & Fr.* : June - October.

Deban road, 83736.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya, Western Ghats.

**Spilanthes paniculata** Wallich ex DC., Prodr. 5 : 625. 1836 ; Joseph, Fl. Nongpoh 162. 1981. *S. acmella sensu* Hook. f., non L. 1753 ; Hook. f., Fl. Brit India 3 : 307. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 118. 1939.

Annual, procumbent herbs *ca* 16 cm tall. Leaves opposite, lanceolate, crenate. Heads globose on long peduncle, yellowish, axillary or terminal.

*Fl. & Fr.* : June - December.

Miao forest, 83102 ; Deban forest, 88296 ;

Wakro - Deban road side, 99524.

*Distrib.* : INDIA : Throughout India ; Tropics of the World.

**Synotis triligulata** (Buch. - Ham. ex D. Don) C. Jaffery & Y. L. Chen in Kew Bull. 39 (2) : 329. 1984. *Senecio triligulatus* Buch. - Ham. ex D. Don, Prodr. Fl. Nep. 178. 1825 ; Hook. f., Fl. Brit. India 3 : 356. 1880.

Shrubs, glabrous, sometimes pubescent. Inflorescence tomentose. Flowers in axillary or terminal rounded heads, white or purplish white.

*Fl. & Fr.* : October - March.

Kamlat to Walap, 87987.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, MYANMAR.

**Tithonia diversifolia** A. Gray in Proc. Amer. Acad. 19 : 5. 1983 ; Balakr., Fl. Jowai 1 : 262. 1981.

Robust shrubs up to 5 m high. Leaves 3 - 7 lobed, 6 - 25 x 3 - 18 cm, ovate, ovoid - rhomboid, narrowed at base, acute or acuminate. Heads terminal, solitary ; involueral bracts greenish - yellow ; florets bright yellow.

*Fl. & Fr.* : September - March.

Miao, 98061.

*Distrib.* : INDIA : An exotic species introduced in India, common in North-east India in waste lands ; AMERICA.

**Vernonia saligna** DC., Prodr. 5 : 33. 1836 ; Hook. f., Fl. Brit. India 3 : 235. 1881 ; Balakr, Fl. Jowai 1 : 271. 1981.

Herbs up to 1 m tall. Leaves sessile or sub sessile, 5 - 12 x 2 - 4 cm, elliptic - oblong, cuneate or acute at base, acute or acuminate. Flowers in terminal corymbs, pinkish or cream coloured. Achenes strongly 10 ribbed.

*Fl. & Fr.* : June - March.

Wakro to Ghao lake, 99507.

*Distrib.* : INDIA : Sikkim, North-east India ; NEPAL, BHUTAN, SOUTH-WEST CHINA.

**Vernonia volkamerifolia** DC., Prodr. 5 : 32. 1836 ; Hook. f., Fl. Brit. India 3 : 240. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 105. 1939.

Small trees or large shrubs ; bark grey brown. Flowers in terminal paniced heads, purplish - white.

*Fl. & Fr.* : October - March.

Krosam to Sirong, 88083 ; Deban forests, 88626 ; 22 - 32 km from Miao I.B. 83619.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Xanthium strumarium** L., Sp. Pl. 917. 1753 ; Hook. f., Fl. Brit. India 3 : 303. 1881 ; Kanjilal *et al.*, Fl. Assam. 3 : 116. 1939 ; *X. indicum* Koen ex Roxb., Fl. Ind. 3 : 601. 1832.

Under shrubs. Leaves alternate, broadly lanceolate to orbicular, cordate, lobed, with irregularly toothed. Fruits ovoid to oblong ; pappus absent.

*Fl. & Fr.* : October - April.

Miao to Deban forest, 83120

*Distrib.* : INDIA : Throughout India ; Widely distributed.

#### CAMPANULACEAE

**Campanopsis parviflora** Wallich ex DC., Prodr. 7 : 423. 1839 ; Balakr., Fl. Jowai 1 : 279. 1981. *Campanumoea parviflora* (DC.)

Benth. & Hook. f., Gen. Pl. 2 : 558, 1876 ; Hook. f., Fl. Brit. India 3 : 436, 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 129, 1939.

Tall herbs, *ca* 1.5 m ; branches drooping. Leaves 2 - 10 × 1 - 2 cm, oblong lanceolate or elliptic lanceolate, rounded at base, acuminate, serrate. Flowers solitary, axillary or terminal, white or pale-pink. Berries greenish.

*Fl. & Fr.* : June - December.

27th mile forest, 84950 ; 10th km away from Deban, 83669 ; Miao forest, 83105.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; BHUTAN.

### LOBELIACEAE

*Lobelia montana* Reinwardt. ex Blume, Bijdr. 728, 1826 ; Mooliono & Tuyn in Fl. Malesiana 6 (1) : 132, 1960. *Pratia montana* Hassk. Fl. 25 Deibl. 1 : 23, 1842 ; C.B. Clarke in Fl. Brit. India 3 : 423, 1881.

Creeping herbs, profusely branched. Leaves 2 - 20 × 1.5 - 2.5 mm, ovate or reniform, rounded or acute. Flowers solitary axillary, bluish. Fruits ellipsoid, dark pinkish.

*Fl. & Fr.* : August - December.

Miao - Deban road, 79087 ; 27th mile camp, 84948 ; Gandhigram, 78730 ; 99553.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, JAVA.

### ERICACEAE

*Agapetes saligna* (Hook. f.) Hook. f. in Benth. & Hook. f., Gen. Pl. 2 : 571, 1876 ; C.B. Clarke in Fl. Brit. India 3 : 444, 1881 ; Balakr., Fl. Jowai 1 : 284, 1981.

Epiphytic shrubs. Leaves sub verticillate or scattered, elliptic lanceolate, cuneate or acute at base, acuminate at apex. Flowers *ca* 2 cm long, red. Fruits red.

*Fl. & Fr.* : October - March.

Gandhigram, 99647.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Agapetes variegata* (Roxb.) G. Don, Gen. Syst. 3 : 862, 1834 ;

C.B. Clarke in Fl. Brit. India 3 : 446. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 136. 1939. *Ceratostema variegatum* Roxb., Fl. Ind. 2 : 413. 1832.

Shrubs. Leaves elliptic lanceolate, cuncate at base, acute to acuminate. Flowers in fasciculate corymbs, pinkish red. Fruits purple - black.

*Fl. & Fr.* : November - April.

34th mile, M.V. road, 79221 ; South bank of Noa - Dihing river at Imbeong, 87620.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR

*Lyonia ovalifolia* (Wallich) Drude in Engler & Prantl, Pflanzenfm. 4 (1) : 44. 1891 ; Balakr., Fl. Jowai 1 : 281. 1981. *Andromeda ovalifolia* Wallich in Asiat. Res. 13 : 391. 1820. *Pieris ovalifolia* (Wallich) D. Don in Edinb. Phil. J. 17 : 159. 1834 ; C.B. Clarke in Fl. Brit. India 3 : 460. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 150. 1939.

**var. ovalifolia**

Small trees or large shrubs up to 3 m high. Leaves 7 - 15 x 4 - 10 cm, ovate to oblong elliptic, rounded at base, abruptly acuminate. Flowers *ca* 1.2 cm long, creamy - white or pale - pink, in more than 8 cm long racemes. Capsules *ca* 4 mm diam., subglobose, depressed above.

*Fl. & Fr.* : April - October.

Debau forest, 98054.

*Distrib.* : INDIA : Punjab, Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA.

*Vaccinium vacciniaceum* (Roxb.) Sleumer in Engl. Bot. Jahrb. 71 : 479. 1941 ; Balakr., Fl. Jowai, 1 : 285. 1981. *Ceratostema vacciniacea* Roxb., Fl. Ind. 2 : 412. 1832. *Agapetes serrata* G. Don, Gen. Syst. 3 : 862. 1834. *Vaccinium serratum* (G. Don) Wight, Icon. Pl. Ind. Orient. 4(1) : 4. t. 1184. 1848 ; C. B. Clarke in Fl. Brit. India 3 : 452. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 141. 1939.

**f. vacciniaceum**

Epiphytic shrubs up to 2 m high. Leaves crowded at apex of branchlets, 2 - 8 x 0.5 - 2 cm, lanceolate, oblanceolate, narrowed at base, acute. Flowers *ca* 1 cm long, greenish - white, in terminal or subterminal racemes. Berries *ca* 8 mm across, globose.

*Fl. & Fr.* : April - October.

Deban to Burma nala, 98068.

*Distrib.* : INDIA : Sikkim, North - east India, NEPAL, MYANMAR.

### MYRSINACEAE

*Amblyanthus glandulosus* (Roxb.) DC. in Ann. Sci. Nat. Ser. 2.16 : 83, t. 6. 1841 ; C.B. Clarke in Fl. Brit. India 3 : 533. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 187. 1939. *Ardisia glandulosa* Roxb., Fl. Ind. 2 : 276. 1824.

Shrubs, ca 4 m tall, bark greyish or reddish brown. Flowers in terminal or sub-terminal, corymbs, pinkish. Fruits with dark brown spots.

*Fl. & Fr.* : May - November.

Pangsu Pass forest, 88268.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

*Ardisia crispa* (Thunb.) DC. in Trans. Linn. Soc. 17 : 124. 1834 ; Kanjilal *et al.*, Fl. Assam 3 : 182. 1939. *Bladhia crispa* Thunb., Fl. Jap. 97. 1784. *Ardisia undulata* C.B. Clarke in Fl. Brit. India 3 : 524. 1882. *A. crinata* Roxb., Fl. Ind. 2 : 276. 1824.

Small shrubs, bark brownish. Flowers in umbels or corymbose cymes, white or yellowish. Fruits secund, blood red.

*Fl. & Fr.* : March - January.

Deban forest, 83527 ; Tulong Kunning, 87969.

*Distrib.* : INDIA : North - east India ; MALAYA.

*Ardisia depressa* C.B. Clarke in Fl. Brit. India 3 : 522. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 179. 1939.

Shrubs ; bark greyish - white, warty. Flowers in axillary umbellate cymes, pinkish. Fruits globose, depressed, brown.

*Fl. & Fr.* : June - December.

Salt lick forest, Miao, 83566.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; MYANMAR.

*Ardisia solanacea* Roxb., Fl. Corom. Pl. 1 : 27. t. 27. 1795 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 554. 1987. *A. humilis* non Vahl ; C.B. Clarke in Fl. Brit. India 3 : 529. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 175. 1939.

Asm. : *Chauldhoa*.

Tall shrubs. Flowers in axillary corymbose racemes, pinkish. Fruits yellowish - green, many in clusters.

*Fl. & Fr.* : March - October.

Miao forest, 81092.

*Distrib.* : INDIA : Throughout India ; MALAYA.

***Ardisia thyrsoflora*** D. Don, Prodr. Fl. Nep. 148. 1825. *A. floribunda* Wallich in Roxb. Fl. Ind. 2 : 272. 1824 ; Kanjital *et al.*, Fl. Assam 3 : 179. 1939. *Ardisia nerifolia* DC. in Trans. Linn. Soc. 17 : 118. t. 8. 1934 ; C.B. Clarke in Fl. Brit. India 3 : 522. 1882.

Small trees, bark greyish - white. Flowers in axillary or terminal paniculate cymes, pink or pale - purplish. Fruits with brownish - green, red dots.

*Fl. & Fr.* : April - October.

Moti jheel & Ganga jheel, 87726 ; 27th mile forest, 87848.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; MYANMAR.

***Ardisia virens*** Kurz, For. Fl. Brit. Burma 2 : 575. 1877 & in J. Asiat. Soc. Beng. 46 (2) : 226. 1877 ; C.B. Clarke in Fl. Brit. India 3 : 524. 1882 ; Kanjital *et al.*, Fl. Assam 3 : 183. 1939.

Asm. : Sedum - sing.

Shrubs or small trees ; bark brown or reddish - brown. Flowers in terminal or sub - terminal corymbs, pale yellow. Fruits red in clusters.

*Fl. & Fr.* : April - December.

Salt lick forest, Miao, 81169 ; Zero camp, 84910 ; Deban forest, 84923 ; 99402.

*Distrib.* : INDIA : North - east India ; MALAYA.

***Embelia floribunda*** Wallich in Roxb., Fl. Ind. 2 : 291. 1824 ; C.B. Clarke in Fl. Brit. India 3 : 514. 1882 ; Kanjital *et al.*, Fl. Assam 3 : 171. 1939.

Large scandent shrubs ; stems reddish - brown. Flowers in panicles, greenish - white. Fruits globose, pinkish - black.

*Fl. & Fr.* : June - February.

Pangsuz Pass forest, 81231 ; Shirong to Humung, 88094.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, MALAYA.

**Embelia ribes** Burm. f., Fl. Ind. 62, t. 23. 1768 ; C.B. Clarke in Fl. Brit. India 3 : 513. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 169. 1939.

Scandent shrubs, up to 5 m high. Leaves 4 - 10 x 1 - 3 cm, ovate to elliptic lanceolate, cuneate at base, acute to acuminate. Flowers ca 3 mm across, globose, black.

*Fl. & Fr.* : April - October.

*Distrib.* : INDIA : Throughout India ; INDO - MALAYA.

**Embelia subcoriacea** (C.B. Clarke) Mez. in Engler, Pflanzenfam. 9 : 329. 1902 ; Kanjilal *et al.*, Fl. Assam 3 : 173. 1939. *E. nagushia* D. Don var. *subcoriacea* C.B. Clarke in Fl. Brit. India 3 : 516. 1882.

*Asm.* : *Ban - merica*.

Scandent or sub-scandent shrubs ; bark dark grey. Flowers in racemes, usually from old wood, pale green. Fruits globose, pinkish at maturity.

*Fl. & Fr.* : May - December.

Deban forests, 84929.

*Distrib.* : INDIA : North east India.

**Hymenandra walllichii** A. DC. in Ann. Nat. Ser. 11. 16 : 84. 1841.

Stout shrubs. Flowers in sub - sessile compound umbels or lateral short branchlets, pinkish. Fruits globose, dark violet.

*Fl. & Fr.* : April - October.

M' Pen check gate, 81004, 86605 ; Salt lick forests, 83577.

*Distrib.* : INDIA : North-east India ; BANGLA DESH.

**Maesa indica** (Roxb.) A. DC., in Trans. Linn. Soc. Lond. 17 : 134. 1834 ; C.B. Clarke in Fl. Brit. India 3 : 509. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 163. 1939. *Baeobotrya indica* Roxb., Fl. Ind. 2 : 230. 1824.

*Asm.* : *Sesu*.

Shrubs or small trees ; bark dark grey or blackish - brown. Flowers in simple or branched axillary racemes, greenish - white. Fruits globose, brownish.



*Fl. & Fr.* : January - December.

Deban forest, 79023, 79191, 83622, 83730 ; Miao forest, 81089 ; 37th mile forest, 83517 ; Salt lick forest, 83570 ; Shirong to Hunnung, 88096 ; Pangsung Pass forest, 88276 ; Deban forest, 88609 ; On the way to Bulbulia, 99564 ; Gandhigram, 99625.

*Distrib.* : INDIA : Throughout India ; AFRICA, MALAYA.

**Maesa indica** (Roxb.) A. DC. var. **angustifolia** Hook. f. & Thomson in Fl. Brit. India 3 : 509, 1881.

Small trees ; bark grey. Leaves very narrow, lanceolate. Flowers in axillary racemes, greenish.

*Fl. & Fr.* : April - January.

33rd mile forest, 79066 & 87640 ; 10th mile, 87783 ; Near Burma nala, 87929.

*Distrib.* : INDIA : North - east India ; MALAYA.

**Maesa montana** DC., Prodr. 8 : 79, 1844 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 561, 1983. *M. chisia non* D. Don 1825 ; C.B. Clarke in Fl. Brit. India 3 : 509, 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 163, 1939.

Shrubs up to 3 m tall. Leaves obovate - elliptic, oblanceolate, 4 1/4 x 2 - 6 cm, rounded or obtuse at base, caudate - acuminate or acute at apex. Racemes usually branched, up to 5 cm long. Flowers ca 3 mm across, white. Fruits ca 5 mm across, white or creamy.

*Fl. & Fr.* : February - November.

Gandhigram, 9962.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, CHINA.

**Myrsine semiserrata** Wallich in Roxb., Fl. Ind. 2 : 293, 1824 ; C.B. Clarke in Fl. Brit. India 3 : 511, 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 166, 1939.

Tall shrubs or small trees ; bark ashy - grey. Flowers in axillary fascicles, often in fallen leaf axils, pinkish green. Fruits globose, pinkish violet.

- *Fl. & Fr.* : October - May.

Krosam, 88025.

*Distrib.* : INDIA : North - east India ; NEPAL, MYANMAR.

**SAPOTACEAE**

**Sarcosperma arboreum** Benth. & Hook. L, Gen. Pl. 2 : 655. 1876 ; C.B. Clarke in Fl. Brit. India 3 : 535. 1882 ; Deb, Fl. Tripura 1 : 432. 1981.

Large evergreen trees, with spreading crowns. Leaves 20 - 23 × 4 - 6 cm, oblong, rhomboid at base, acuminate, bifarious, rarely alternate. Flowers in paniced spikes, pubescent, small, fragrant, clustered. Berries with milky juice when young. 1 or 2 seeded.

*Fl. & Fr.* : November - July.

29th mile, M.V. road, 86613.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Tripura, Meghalaya.

**STYRACEAE**

**Bruinsmia polysperma** (C.B. Clarke) van Steenis in Bot. Jahrb. 86 : 390 - 393. f. 3. 1967 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 581. 1987. *Styrax polysperma* C.B. Clarke in Fl. Brit. India 3 : 590. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 221. 1939.

Medium sized trees ; bark greyish - brown. Flowers in axillary dichotomously branched cymes, white. Fruits ellipsoid, sour in taste.

*Fl. & Fr.* : March - November.

39th mile forest, 87668.

*Distrib.* : (INDIA : North -east India ; MYANMAR.

**Styrax serrulatum** Roxb., Fl. Ind. 2 : 415. 1832 ; C.B. Clarke in Fl. Brit. India 3 : 588. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 219. 1939.

*Asm.* : *Phulkut*.

Small trees ; bark grey or dark grey. Flowers in small paniculate racemes, white or yellowish - white. Fruits ellipsoid, brownish with persistent cupular calyx.

*Fl. & Fr.* : March - November.

40th mile forest, 87932 ; Nangoi, 88255.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MALAYA.

## SYMPLOCACEAE

**Symplocos pealii** King ex Das in Fl. Assam 3 : 214. 1939.

Small trees ; bark greyish - brown. Flowers in cymes on old wood, axillary or extra axillary, reddish. Fruits sub cylindrical, brownish.

*Fl. & Fr.* : July - December.

Haldibari to Hornbill, 87711.

*Distrib.* : INDIA : Arunachal Pradesh.

## OLEACEAE

**Jasminum amplexicaule** Buch. Ham. ex. G. Don, Gen. Syst. 4 : 60. 1837 ; Balakr., Fl. Jowai 2 : 302. 1983. *J. undulatum* Ker. - Gawl in Edgew. Bot. Reg. 6. t. 436. 1820, *non* Willd. 1797 ; C.B. Clarke in Fl. Brit. India 3 : 592. 1881 ; Kanjilal *et al.*, Fl. Assam 3 : 225. 1939.

Scandent shrubs. Leaves 2.5 - 5 × 1.5 - 3 cm, ovate-lanceolate, sub - cordate at base, acute or acuminate. Flowers subcapitate, axillary, few flowered, white. Fruits ellipsoid, red.

*Fl. & Fr.* : August - March.

Jairampur, 19965.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; BHUTAN, CHINA, MALAYA.

**Jasminum azoricum** L., Sp. Pl. 7. 1753 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 586. 1987. *J. flexile* Vahl, Sumb. Bot. 3 : 1. 1794 ; C.B. Clarke in Fl. Brit. India 3 : 601. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 231. 1939.

Large climbing shrubs ; bark greyish - white. Flowers in lax panicles, white. Fruits ellipsoid drupes.

*Fl. & Fr.* : October - April.

West of Happy valley, 85131.

*Distrib.* : INDIA : North -east & South India ; SRI LANKA.

**Jasminum coarctatum** Roxb., Fl. Ind. 1 : 92. 1820 ; C.B. Clarke in Fl. Brit. India 3 : 593. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 226. 1939.

*Asm.* : *Kharikalata*.

Large woody climbers ; bracts foliaceous. Flowers in axillary capitate cymes, white. Fruits purplish when ripe.

*Fl. & Fr.* : March - October.

12th mile forest, 83791 ; South - west of 10th mile camp, 87754 ; Pangsau Pass forest, 26595.

*Distrib.* : INDIA : North -east India ; MYANMAR.

*Jasminum lanceolaria* Roxb., *Fl. Ind.* 1 : 97, 1820 ; C.B. Clarke in *Fl. Brit. India* 3 : 601, 1882 ; Kanjilal *et al.*, *Fl. Assam* 3 : 232, 1939.

Scandent shrubs. Flowers in axillary or terminal trichotomous cymes, white. Fruits ellipsoid, purplish.

*Fl. & Fr.* : June - February.

Krosam to Shirong, 88052 ; P. Kund, 96356.

*Distrib.* : INDIA : North -east India.

*Jasminum multiflorum* (Burm. f.) Andr., *Bot. Rep.* 8, t. 496, 1807 ; Deb, *Fl. Tripura* 2 : 6, 1983. *Nyctanthes multiflora* Burm. f., *Fl. Ind.* 5, t. 3, f. 1, 1768. *J. pubescens* Willd., *Sp. Pl.* 1 : 37, 1797 ; C.B. Clarke in *Fl. Brit. India* 3 : 592, 1882 ; Kanjilal *et al.*, *Fl. Assam* 3 : 226, 1939.

Scandent shrubs, young parts villous. Leaves ovate, acuminate, entire, more or less pubescent. Flowers in short pedunculate cymes, white. Fruits ellipsoid, black.

*Fl. & Fr.* : August - April.

20 km from Miao to Deban, 83187.

*Distrib.* : INDIA : Throughout India ; MYANMAR, CHINA.

*Jasminum nepalense* Sprengel in L., *Syst. Veg.* 4 (2) : 12, 1828 ; Balakr., *Fl. Jowai* 1 : 303, 1981. *J. glandulosum* G. Don, *Gen. Syst.* 4 : 61, 1837 ; C.B. Clarke in *Fl. Brit. India* 3 : 599, 1882 ; Kanjilal *et al.*, *Fl. Assam* 3 : 229, 1939.

Scandent shrubs. Leaves elliptic to ovate - lanceolate, rounded at base, acuminate. Flowers solitary axillary or few flowered trichotomous terminal cymes, white or creamy white. Fruits ellipsoid, greenish - purple.

*Fl. & Fr.* : June - February.

Pangsau Pass, 26618.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN.

**Jasminum nervosum** Lour., *Fl. Cochinch.* 20. 1790; Haridasan & Rao, *For. Fl. Meghalaya* 2 : 587. 1987. *J. anastomosans* DC., *Prodr.* 8 : 305. 1844; C.B. Clarke in *Fl. Brit. India* 3 : 596. 1882; Kanjilal *et al.*, *Fl. Assam* 3 : 228. 1939.

Scandent shrubs; stems usually puberulous. Flowers in cymes, 1 - 5 flowered, white. Fruit ellipsoid, greenish - violet with 1 seed.

*Fl. & Fr.* : April - December.

Miao forest, 81079.

*Distrib.* : INDIA : North - east India ; MALAYA.

**Jasminum sambac** (L.) Ait., *Hort. Kew* 1 : 8. 1789; C.B. Clarke in *Fl. Brit. India* 3 : 391. 1882; Deb, *Fl. Tripura* 2 : 7. 1983. *Nyctanthes sambac* L., *Sp. Pl.* 6. 1753.

*Asm.* : *Dua mali*.

Erect shrubs, often with scandent branches. Leaves opposite, ovate to orbicular, acute to obtuse at apex, entire, glabrous. Flowers axillary solitary or in cymes, white. Fruits globose, black.

*Fl. & Fr.* : June - November.

20 km onwards M' Pen, 83187.

*Distrib.* : INDIA : Throughout tropics; Pantropics, under cultivation.

**Jasminum subtriplinerve** Blume, *Mus. Bot. Lugd. Bot.* 1 : 272. 1850; C.B. Clarke in *Fl. Brit. India* 3 : 596. 1882; Kanjilal *et al.*, *Fl. Assam* 3 : 228. 1939.

Scandent, bushy shrubs; stems puberulous. Flowers in axillary or terminal cymes, 1 - 5 flowered, white. Fruits globose.

*Fl. & Fr.* : March - December.

East of 10th mile towards Noa-Dihing river, 87774; Pangsung Pass forest, 26631; P. Kund 99468.

*Distrib.* : INDIA : North - east India ; BANGLA DESH.

**Myxopyrum smilacifolium** (Wallich) Blume, *Mus. Bot. Lugd. Bot.* 1 : 320. 1850; C.B. Clarke in *Fl. Brit. India* 3 : 618. 1882; Kanjilal *et al.*, *Fl. Assam* 3 : 243. 1939. *Chionanthus smilacifolia* Wallich in *Roxb., Fl. Ind.* 1 : 108. 1820.

Asm. : *gohora lata*.

Large climbers ; branched 4-angled. Flowers in trichotomous panicles, yellowish. Fruits sub - globose, orange yellow.

*Fl. & Fr.* : May - February.

On the way to Deban, 79081, 83510 ; Deban forest, 83585.

*Distrib.* : INDIA : North -east & South India ; MALAYA.

***Olea dioica*** Roxb., *Fl. Ind.* 1 : 105. 1820 ; C.B. Clarke in *Fl. Brit. India* 3 : 612. 1882 ; Kanjilal *et al.*, *Fl. Assam* 3 : 237. 1939.

Asm. : *Poreng*.

Tall trees ; bark brown or dark grey. Flowers in lax panicles, yellowish white or white. Fruits ovoid, light green when ripe.

*Fl. & Fr.* : April - December.

Hornbill, 87707 ; East of 10th mile forest, 87770.

*Distrib.* : INDIA : Throughout India ; BANGLA DESH.

### APOCYNACEAE

***Allamanda cathartica*** L., *Mant. Pl.* 2 : 241. 1771 ; Kurz, *For. Fl. Brit. Burma* 2 : 164. 1877 ; Kanjilal *et al.*, *Fl. Assam* 3 : 247. 1939.

Scandent shrubs with milky latex. Flowers in axillary paniced cymes, bright yellow, showy. Fruit a spiny capsule.

*Fl. & Fr.* : August - December.

Namsai forest area, 47829.

*Distrib.* : INDIA : Cultivated species ; Native of tropical AMERICA.

***Chonemorpha fragrans*** (Moon) Alston in *Ann. R. Bot. Gard. Perd.* 11 : 203. 1929 ; Balakr., *Fl. Jowai* 2 : 308. 1983. *Echites fragrans* Moon, *Cat. Pl. Ceylon* 20. 1824. *E. macrophylla* Roxb., *Fl. Ind* 2 : 13. 1832. *Chonemorpha macrophylla* (Roxb.) G. Don., *Gen. Syst.* 4 : 76 1837 ; Hook. f., *Fl. Brit. India* 3 : 661. 1882 ; Kanjilal *et al.*, *Fl. Assam* 3 : 265. 1939.

Lianas. Leaves 10 - 30 x 10 - 20 cm, obovate - orbiculate, rounded or truncate at base. Flowers ca 8 cm across, white, fragrant, in terminal cymes. Fruits diverging follicles.

*Fl. & Fr.* : May - January.

Gandhigram, 99689.

*Distrib.* : INDIA : Throughout India ; INDO - MALAYA.

**Holarrhena pubescens** (Buch. - Ham.) Wallich ex G. Don, Gen. Syst. 4 : 78. 1838 ; Panigr. in Taxon 36 (2) : 466. 1987. *Echites pubescens* Buch. Ham. in Trans. Linn. Soc. Lond. 13 : 524. 1822. *Holarrhena antidysenterica sensu* Hook. f., Fl. Brit. India 3 : 644. 1882.

Shrubs up to 2 m tall. Leaves 18 x 9 cm, ovate to elliptic, acuminate, rounded at base, acuminate. Flowers ca 4 cm long, white, in terminal and axillary corymbose cymes.

*Fl. & Fr.* : April - December.

Wakro road, 97469.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, West Bengal, North east India ; NEPAL, MYANMAR, INDO - CHINA, MALAYA.

**Melodinus khasianus** Hook. f., Fl. Brit. India 3 : 629. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 248. 1939 ; Deb, Fl. Tripura 2 : 19. 1983.

Large climbers, with milky juice. Leaves elliptic lanceolate or narrow lanceolate, cuneate at base, acuminate. Flowers in terminal paniced cymes ; white, turning yellowish. Fruits globose, yellowish white.

*Fl. & Fr.* : May - December.

Pangsu Pass forest. 26629.

*Distrib.* : INDIA : Arunachal Pradesh, Tripura, Meghalaya ; BANGLA DESH, MYANMAR.

**Parabarium micranthum** (DC.) Pierr ex Spire, Caoutch. Indo - China 9 : 38. 1906 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 604. 1987. *Ecdysanthera micrantha* DC., Prodr. 8 : 441. 1844 ; Hook. f., Fl. Brit. India 3 : 662. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 266. 1939.

Woody climbers ; bark rough white. Flowers in stout peduncled paniculate trichotomous cymes, yellow ; follicles divaricate, ca 8 cm long, pointed.

*Fl. & Fr.* : April - December.

Jairampur, 88232.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BANGLA DESH, MYANMAR.

**Pottsia laxiflora** (Blume) O. Ktze., Rev. Gen. 416. 1891 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 605. 1897. *Vallaris laxiflora* Blume, Bijdr. 1045. 1827. *Pottsia cantonensis* Hook. & Arn., Bot. Buch. Voy. 199. t. 43. 1837 ; Hook. f., Fl. Brit. India 3 : 652. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 257. 1939.

Large climbers ; young parts tomentose. Flowers lax paniculate trichotomous cymes, pinkish white, dark pink at the base of corolla.

*Fl. & Fr.* : May - October.

Miao forest, 81130.

*Distrib.* : INDIA : North -east India ; MALAYA.

**Tabernaemontana divaricata** (L.) Roem. & Schult. Syst. Veg. 4 : 427. 1819 ; Balakr., Fl. Jowai 2 : 311. 1983. *Nerium divaricatum* L., Sp. Pl. 209. 1753. *Tabernaemontana coronaria* (Jacq.) Willd. : Hook. f., Fl. Brit. India 3 : 646. 1882 ; Kanjilal *et al.*, Fl. Assam 3 : 258. 1939.

*Asm.* : *Kathandaphul*.

Small shrubs. Leaves elliptic or oblong lanceolate, cuneate at base, acute or acuminate at apex. Flowers in axillary, lax corymbose cymes, white, fragrant. Fruits ellipsoid, orange red.

*Fl. & Fr.* : January - December.

Jairampur, 19919 ; P. Kund, 99463.

*Distrib.* : INDIA : Throughout India ; Cultivated in the garden.

### ASCLEPIDIACEAE

**Cryptolepis buchananii** Roem. & Schult., Syst. Veg. 4 : 409. 1819 ; Hook. f., Fl. Brit. India 4 : 5. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 277. 1939.

*Asm.* : *Garang - dukha*.

Climbing shrubs with milky latex. Flowers in trichotomous, sub - globose cymes, pale yellow or pinkish. Follicles divaricate, pointed.

*Fl. & Fr.* : April - December.

22nd mile forest area, 87849.



*Distrib.* : INDIA : Throughout India ; NEPAL, BHUTAN, MALAYA.

**Gongronema nepalense** (Wallich) Decne. in DC., Prodr. 8 : 624. 1844 ; Hook. f., Fl. Brit. India 4 : 33. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 292. 1939.

Extensive twiners ; shoots and cymes puberulous. Flowers in umbellate branched cymes, many - flowered, yellow.

*Fl. & Fr.* : August - February.

Shirong to Hunnung, 88216.

*Distrib.* : INDIA : North -east India ; NEPAL, BHUTAN, MYANMAR.

**Hoya glabulosa** Hook. f. in Gard. Chron. 2 : 732, t. 115. 1882 & Fl. Brit. India 4 : 60. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 307. 1939.

Extensive climbers, shoots and cymes villous. Flowers in long peduncled cymes, yellowish white. Fruits long follicles.

*Fl. & Fr.* : August - February.

Moti jheel & Ganga jheel, 87723.

*Distrib.* : INDIA : North -east India ; BANGLA DESH.

**Hoya lobbii** Hook. f., Fl. Brit. India 4 : 54. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 303. 1939.

Stout climbers or under shrubs. Flowers in long pedunculate umbels, purplish - red. Fruits long follicles.

*Fl. & Fr.* : June - December.

22 km to Deban, in the forest, 83508.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya.

**Marsdenia roylei** Wight, Contrib. Bot. India 40, 1834 ; Hook. f., Fl. Brit. India 4 : 35. 1883.

Climbing shrubs. Leaves ovate - cordate, acuminate. Flowers in corymbose cymes, yellowish. Follicles beaked.

*Fl. & Fr.* : March - October.

27th mile, M.V. road 87889.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh ; MYANMAR.

**Pentasachme caudatum** Wallich ex Wight, Contrib. Bot. India 60. 1834 ; Hook. f., Fl. Brit. India 4 : 28. 1883.

Erect herbs, densely tufted. Leaves linear - lanceolate, caudate acuminate. Flowers in axillary cymes, yellowish white ; seeds red brown.

*Fl. & Fr.* : August - October.

Right bank of Noa - Dihing river, Deban, 85063 & 85137.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; MYANMAR.

**Pentasacme wallichii** Wight, Contrib. Bot. India 60 . 1834 ; Hook. f., Fl. Brit. India 4 : 28. 1883.

Stout epiphytic or lithophytic herbs with slender pendulous branches. Flowers very long on umbellate cymes, white.

*Fl. & Fr.* : August - December.

Near Deban, 85000.

*Distrib.* : INDIA : Uttar Pradesh, Arunachal Pradesh ; BANGLADESH.

### LOGANIACEAE

**Gardnaria ovata** Wallich in Roxb., Fl. Ind. 1 : 400. 1820 ; C.B. Clarke in Fl. Brit. India 4 : 93. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 320. 1939.

Climbing shrubs. Leaves 6 - 12 × 2 - 5 cm, oblong to ovate lanceolate, rounded at base, acute. Flowers in dichasial cymes, yellow or orange. Berries globose, red.

*Fl. & Fr.* : March - December.

Pangsu Pass, 26619.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya, Western Ghats.

### BUDDLEJACEAE

**Buddleja asiatica** Lour., Fl. Cochinch. 72. 1790 ; C.B. Clarke in Fl. Brit. India 4 : 82. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 321. 1939.

Asm. : *Posutia bonchini*.

Shrubs ; branches slender, grey tomentose. Flowers on long spikes, thyrsoid, white. Fruits ovoid capsule.

*Fl. & Fr.* : January - November.

On the way to Deban, 79037 ; 10th km away from Deban, 83620 ; Happy valley area, 83772 ; 26th mile forest, 86675 ; On the way to Vijoyanagar, 99550 ; P. Kund, 99474.

*Distrib.* : INDIA : Throughout India ; MALAYA.

### GENTIANACEAE

**Canscora andographioides** C.B. Clarke in J. Linn. Soc. 14 : 431. 1875 ; Hook. f., Fl. Brit. India 4 : 105. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 322. 1939.

Slender erect branched herbs, stem quadrangular. Flowers in axillary, dichotomous cymes or solitary, purplish white.

*Fl. & Fr.* : October - March.

Nampong forest, 88726 ; 27th mile, M.V. road, 9958 ; Gandhigram, 99619 & 99636.

*Distrib.* : INDIA : North -east India ; MYANMAR.

**Exacum tetragonum** Roxb., Fl. Ind. 1 : 413. 1820 ; C.B. Clarke in Fl. Brit. India 4 : 95. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 322. 1939.

Erect herbs ; stems quadrangular. Leaves sessile, broadly lanceolate, acute to acuminate. Flowers in terminal paniculate cymes, bluish. Fruits ellipsoid capsule.

*Fl. & Fr.* : October - February.

20 kms onward to M'Pen, 83181.

*Distrib.* : INDIA : Arunachal Pradesh ; MALAYA, BORNEO, PHILIPPINE.

**Gentiana campanulacea** (Wallich & Griffith) Marq. in Kew Bull. 1931 : 70. 1931 ; Kanjilal *et al.*, Fl. Assam 3 : 323. 1939. *Crawfordia campanulacea* Wallich & Griffith } C.B. Clarke in Fl. Brit. India 4 : 106. 1883.

Slender - twiner. Leaves elliptic - acuminate, coriaceous, entire. Flowers axillary, solitary on long peduncles, purple or mauve ; seeds winged.

*Fl. & Fr.* : February - May.

Miao - Deban road side forest, 79147.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

***Gentiana speciosa*** (Wallich) Marq. in Kew Bull. 1931 : 70. 1931 ; Hara, Fl. E. Himal. 255. 1966. *Crawfordia speciosa* Wallich, Tent. Fl. Nep. 64, t. 48. 1826 ; C.B. Clarke in Fl. Brit. India 4 : 106. 1883.

Weak climbers. Leaves elliptic cuneate or rounded at base, acuminate, minutely denticulate. Flowers axillary, showy, violet, blue or purplish ; seeds winged.

*Fl. & Fr.* : November - March.

Near Burma nala, 87653 ; 99589.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, MYANMAR.

#### STRYCHNACEAE

***Strychnos quintuplinervis*** A.W. Hill in Kew Bull. 1917 : 166. 1917 ; Kanjilal *et al.*, Fl. Assam 3 : 317. 1939.

Scandent shrubs, straggling, pubescent. Leaves elliptic to ovate, acuminate, tendrils coiled. Flowers in corymbs, greenish. Fruits 1 seeded ovoid.

*Fl. & Fr.* : June - December.

17th mile forest, 83745.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; MALAYA.

***Strychnos wallichiana*** Benth. in J. Linn. Soc. 1(3) : 102. 1856 ; C.B. Clarke in Fl. Brit. India 4 : 90. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 317. 1939.

Asm. : *Gonsila soukhal*.

Large climbing shrubs. Leaves ovate to oblong, acuminate, glossy green. Flowers in dense cymes greenish white. Fruits beaked at tip.

*Fl. & Fr.* : April - August.

Kanubari, 26757.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; BANGLADESH.

## HYDROPHYLLACEAE

**Hydrolea zeylanica** (L.) Vahl, Syn. Bot. 2 : 46. 1791 ; Dalz. & C.B. Clarke in Fl. Brit. India 4 : 133. 1883 ; Deb. Fl. Tripura 2 : 310. 1983. *Nama zeylanica* L., Sp. Pl. 226. 1753.

Perennial, much branched herbs ; stems procumbent, ca 40 cm long. Leaves variable in shape, 2.5 × 0.4 - 0.6 cm. lanceolate or oblanceolate, glabrous except margins. Flowers solitary, axillary or in racemes or panicles, lilac blue segments and white tubes. Fruits ovoid capsule.

*Fl. & Fr.* : September - December.

Deban nala, 85103.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYSIA.

## BORAGINACEAE

**Cordia dichotoma** Forst. f., Prodr. 18. 1786 ; Kanjilal *et al.*, Fl. Assam 3 : 330. 1939. *C. myxa non* L. 1753 ; C.B. Clarke in Fl. Brit. India 4 : 136. 1883.

*Asm.* : *Goborsuta*.

Trees, medium size, ca 20 m tall. Leaves ovate elliptic - oblong, acuminate, entire. Flowers in corymbose cymes, white, fragrant. Fruits ovoid, 1 - seeded.

*Fl. & Fr.* : April - December.

South bank of Noa Dihing, 85018.

*Distrib.* : INDIA : Throughout India ; CHINA, MALAYA, AUSTRALIA.

**Cynoglossum glochidiatum** Wallich ex Benth. in Royle, Illus. Bot. Himal. 306. 1836 ; C.B. Clarke in Fl. Brit. India 4 : 156. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 337. 1939. *C. vesiculosum* Wallich ex G. Don, Gen. Syst. 4 : 354. 1838. *C. edgeworthii* A. DC. in DC., Prodr, 10 : 150. 1846 ; C.B. Clarke in Fl. Brit. India 4 : 158. 1883. *C. denticulatum* A. DC. in DC., Prodr. 10 : 150. 1846 ; C.B. Clarke in Fl. Brit. India 4 : 157. 1883.

Tall herbs or undershrubs, hispid, diffuse. Leaves lanceolate. Flowers in capitate cymes, white. Fruits with 4 - nutlets.

*Fl. & Fr.* : July - October

Deban forest, 85035.

*Distrib* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MALAYA.

*Cynoglossum furcatum* Wallich in Roxb., Fl. Ind. 2 : 6. 1824 ; C.B. Clarke in Fl. Brit. India 4 : 155. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 337. 1939.

Erect herbs or under shrubs. Flowers in long racemes, bluish. Fruits with glochidiate nutlets.

*Fl. & Fr.* : December - June.

Shirong to Hunung, 88092.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYA, AFGANISTAN.

*Cynoglossum glochidiatum* Wallich ex Benth. in Royle, Illus. Bot. Himal. 306. 1836 ; C.B. Clarke in Fl. Brit. India 4 : 156. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 337. 1939.

Tall herbs or undershrubs, hispid, diffuse. Leaves lanceolate. Flowers in capitate cymes, white. Fruits with 4 - nutlets.

*Fl. & Fr.* : July - October

Deban forest, 85035.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MALAYA.

*Cynoglossum zeylanicum* (Vahl ex Hornem.) Thunb. ex Lehm. in Neue Schriften Naturf. Gen. Halle 3 (2) : 20. 1817 ; Kazmi in J. Arn. Arb. 52 : 344. 1971. *Anchusa zeylanica* Vahl ex Hornem., Enum. Hafn. 3 : 1807. *Cynoglossum denticulatum* A. DC. var. *zeylanicum* (Vahl ex Hornem.) C.B. Clarke in Fl. Brit. India 4 : 157. 1883 ; C.B. Clarke *l.c.* 4 : 155.

Tall herbs up to 1 m high. Leaves 10 x 30 cm, elliptic - lanceolate, narrowed at base, acute. Flowers ca 4 mm long, bluish violet, in terminal or axillary cymes. Fruits ca 1 cm across.

*Fl. & Fr.* : June - December.

Deban forest, 96373.

*Distrib.* : INDIA : Throughout India ; AFGANISTAN, NEPAL, BHUTAN, SRI LANKA, CHINA, JAPAN, MALAYSIA.

*Tournefortia viridiflora* Wallich in Roxb., Fl. Ind. 1 : 5. 1820 ; C.B. Clarke in Fl. Brit. India 4 : 146. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 336. 1939.

*Asm.* : Siamtsang.

Scandent shrubs, ca 1.5 m tall ; young parts hairy. Flowers in cymes, tubular, greenish white. Fruits drupe.

*Fl. & Fr.* : April February.

Nampong river side, 88696.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

**Trichodesma khasianum** C.B. Clarke in Fl. Brit. India 4 : 154. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 338. 1939.

Stout somewhat setose shrubs. Flowers in many flowered terminal corymbose racemes. Fruits ellipsoid, ridged ; nutlets with wide margined.

*Fl. & Fr.* : October January.

Near Tulung Kunung, 87956.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

### CONVOLVULACEAE

**Argyreia argentea** (Roxb.) Choisy in Mem. S. Phys. Hist. Nat. Geneve 6 : 418. 1834 ; C.B. Clarke in Fl. Brit India 4 : 185. 1883 ; Balakr., Fl. Jowai 2 : 328. 1983. *Lettsomia argentea* Roxb., Fl. Ind. 2 : 79. 1824.

Large climbers. Leaves 6 12 × 3 10 cm, ovate - cordate, acute, membranous, sparsely hairy above silky tomentose beneath. Flowers in dense corymbose cymes, pinkish purple. Berries globose, yellow orange.

*Fl. & Fr.* : July March.

12th mile forest, 83790 ; Zero point, 8492 ; Deban forest, 99408.

*Distrib.* : INDIA : West Bengal, North east India ; BANGLA DESH.

**Argyreia nervosa** (Burm. f.) Bojer, Hort. Murit. 224. 1837 ; Kanjilal *et al.*, Fl. Assam 3 : 342. 1939. *A. speciosa* (L. f.) Sw. Hont. Brit. 289. 1827 ; C.B. Clarke in Fl. Brit. India 4 : 185. 1883. *A. wallichii* Choisy ; C.B. Clarke *l. c.* 187.

Large climbers. Leaves 18 25 × 12 18 cm, broadly ovate to orbicular, rounded at base, acute to acuminate. Flowers in dense, axillary, capitate cymes, white or mauve ; bracts large, foliaceous.

*Fl. & Fr.* : August December.

Miao to Deban, 83111.

*Distrib.* : INDIA : Widely distributed ; CHINA, JAVA MAURITIUS.

*Argyrea roxburghii* Choisy in Mem. S. Phys. Hist. Nat. Geneve 6 : 419. 1834 ; C.B. Clarke in Fl. Brit. India 4 : 185. 1883. *Convolvulus roxburghii* Wallich, Cat. 38. n. 1418. 1829. *A. roxburghii* var. *ampla* (Choisy) C.B. Clarke in Fl. Brit. India 4 : 185. 1883.

Shrubs. Leaves ovate cordate, acute, villous on both surfaces. Flowers in dense corymbose cymes, purplish white.

*Fl. & Fr.* : August October.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL.

*Argyrea sikkimensis* (C.B. Clarke) Ooststr. in Blumea 7 : 178. 1952. *Lettsonia sikkimensis* C.B. Clarke in Fl. Brit. India 4 : 194. 1883 ; Kanjilal *et al.* Fl. Assam 3 : 344. 1939.

Large climbers. Leaves elliptic, cuneate at base, acuminate, hairy beneath. Flowers few in cymes, purple or violet; ovary 2 celled.

*Fl. & Fr.* : November April.

On the way to Imbeong from 34th mile, M.V. road, 86700.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; BANGLADESH.

*Ipomea kingii* Prain in J. Asiat. Soc. Beng 63 (2) : 110. 1894 ; Kanjilal *et al.*, Fl. Assam 3 : 357. 1939. *I. cymosa* var. *macra* C.B. Clarke in Fl. Brit. India 4 : 212. 1883.

Large climbers. Leaves ovate, cordate, acute, glabrous above, hirsute beneath. Flowers in cymes, white ; seeds covered with long brownish grey hairs.

*Fl. & Fr.* : August November.

Berdumsa to Rajnagar, 88222

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Tripura ; MYANMAR.

*Merremia mammosa* (Lour.) Hallier f. in Tevsmania 7 : 164. 1879. *Convolvulus mammosus* Lour., Fl. Cochinch. 1 : 108. 1790. *Ipomea gomejit* C.B. Clarke in Fl. Brit. India 4 : 211. 1883. Kanjilal *et al.*, Fl. Assam 3 : 349. 1939.



Large climbers. Flowers in corymbs, very large. Fruits globose, brownish with a crescent calyx.

*Fl. & Fr.* : January - June.

On the way to Deban from Miao, 88645.

*Distrib.* : INDIA : Arunachal Pradesh, Andamans ; MYANMAR, MALAYA.

*Merremia umbellata* (L.) Hallier f. subsp. *orientalis* (Hallier f.) Ooster' in van Steenis, Fl. Malesiana 1 : 4 (4) : 449. 1953. *Convolvulus umbellatus* Hallier f. in Bull. Bot. Soc. Beng. 35 : 270. 1896.

*Asm.* : *Kolia lota*.

Twiners. Leaves variable in shape and size, ovate-oblong or oblong, truncate or cordate at base, acuminate, densely hairy on lower surface. Flowers in axillary, umbellate cymes, white or yellow. Berries 4-valved.

*Fl. & Fr.* : August - December.

19th mile forest, 85150.

*Distrib.* : INDIA : Widely distributed species ; SRI LANKA, CHINA, THAILAND, MALAYSIA, AFRICA.

### SOLANACEAE

*Lycianthes laevis* subsp. *crassipetala* (Wallich) Deb in Bot. J. Linn. Soc. 76. 293. 1978. *L. pachypetala* Bitter in Abh. Nat. Ver Bremen 24 : 475. 1920 ; Kanjilal *et al.*, Fl. Assam 3 : 372. 1939. *Solanum crasipetalum* Wallich in Roxb., Fl. Ind. 2 : 256. 1824 ; C.B. Clarke in Fl. Brit. India 4 : 232. 1883.

Shrubs. Leaves 9-14 × 3-6 cm, elliptic-lanceolate, narrowed at base, acuminate, entire, glabrous. Flowers in axillary clusters, white. Berries ovoid, red or orange.

*Fl. & Fr.* : September - December.

Salt lick forest, 83552.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN.

*Physalis peruviana* L., Sp. Pl. ed. 2. 1670. 1763.

Bushy herbaceous annuals. Flowers solitary, axillary, yellow with 5 large purple spots at the base of corolla.

*Fl. & Fr.* : October February.

Shirong to Hunang, 88098.

*Distrib.* : INDIA : Throughout India ; Tropics of the World.

*Solanum anguivi* Lam., *Encycl. Meth Bot.* 2 : 3. 1793 ; Hawkes in *Bot. J. Linn. Soc.* 76 : 290. 1978. *S. indicum non L.* ; C.B. Clarke in *Fl. Brit. India* 4 : 234. 1883 ; Kanjilal et al., *Fl. Assam* 3 : 369. 1939.

*Asm.* : *Bekuri.*

Shrubs, stellately tomentose ; stem and branches with yellowish curved prickles. Flowers in sub-terminal scorpioid cymes, purple or violet.

*Fl. & Fr.* : June December.

Miao forest, 83110 ; Deban forest, 88714.

*Distrib.* : INDIA : Throughout India ; CHINA, PHILIPPINES, MALAYA.

*Solanum ciliatum* Lam., *Illus.* 2 : 21. 1793 ; D. Arcey in *Ann. Miss. Bot. Gard.* 61 : 842. 1974. *Solanum aculeatissimum non Jacq.* 1786 ; *sensu* C.B. Clarke in *Fl. Brit. India* 4 : 237. 1883.

Robust, prickly shrubs ; branches spreading ; prickles straight or recurved. Leaves 3-12 × 1-10 cm, ovate, cordate at base, acute, shallowly lobed, prickly and hirsute at both the surfaces. Flowers in short lateral racemes, white. Berries globose, yellow.

*Fl. & Fr.* : May October.

Jairampur forest, 81188 ; 22-32 km from Miao forest, 83615.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; SINGAPORE, MALAYA.

*Solanum erianthum* D. Don, *Prodr. Fl. Nep.* 96. 1825 ; Haridasan & Rao, *For. Fl. Meghalaya* 2 : 647. 1987. *S. verbascifolium non L.* 1753 ; C.B. Clarke in *Fl. Brit. India* 4 : 253. 1883 ; Kanjilal et al., *Fl. Assam* 3 : 367. 1939.

Large shrubs or small trees. Flowers in terminal paniced cymes, white. Fruits berries, yellowish when ripe.

*Fl. & Fr.* : Throughout the year.

Krosam to Shirong 88085.

*Distrib.* : INDIA : North-eastern India ; Tropics & Sub-tropics of the World.

*Solanum kurzii* Brace ex Prain in J. Asiat. Soc. Beng. 65 (2) : 541. 1896 ; Kanjilal *et al.*, Fl. Assam 3 : 368. 1939. *S. pubescens* Willd. var. *lobata* C.B. Clarke in Fl. Brit. India 4 : 231. 1883, *pro. syn.*

Under shrubs; branches densely stellately woolly. Flowers in rusty tomentose sub terminal racemose cymes. Fruits globose, hard, green when young.

*Fl. & Fr.* : October December.

Firmbase, 83710.

*Distrib.* : INDIA : North east India ; MYANMAR.

*Solanum laevis* (Dunal) Bitter subsp. *subtruncate* (Wallich ex Dunal) Deb in Bot. J. Linn. Soc. 71 : 293. 1978 & Fl. Tripura 2 : 240. 1983. *S. subtruncatum* Wallich ex Dunal in DC., Prodr. 13 (1) : 180. 1852 ; C.B. Clarke in Fl. Brit. India 4 : 231. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 372. 1939.

Shrubs glabrous, branches spreading. Leaves 8-13 × 2.5-5 cm, lanceolate, cuneate at base, acuminate, entire, membranous. Flowers in axillary clusters, bluish white. Berries ca 5 mm across globose, smooth, blood red when ripe.

*Fl. & Fr.* : July December.

West of Happy Valley, 85128 ; Deban forest, 79007 ; Kamlat to Krosam, 88014 ; Firmbase, 83722 ; Near Deban, 84932.

*Distrib.* : INDIA : Bihar, Sikkim, North east India ; MYANMAR.

*Solanum lysimachioides* Roxb., Fl. Ind. 2 : 257. 1832 ; Balakr., Fl. Jowai 2 : 332. 1983. *S. macrodon* Nees var. *lysimachioides* (Roxb.) C.B. Clarke in Fl. Brit. India 4 : 232. 1883.

Herbs, slender, prostrate, decumbent. Leaves 1-3 × 0.5-1.8 cm, ovate, acute to short acuminate, pubescent. Flowers solitary, axillary, pale purple. Berries blood red.

*Fl. & Fr.* : July November.

19th mile forest, 85151.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim, North east India ; BHUTAN.

*Solanum myriacanthum* Dunal, Hist. Solan. 218. t. 19. 1813 & DC., Prodr. 13 : 243. 1852 ; Haridasan & Rao, For. Fl. Meghalaya

2 : 648. 1987. *S. khasianum* C.B. Clarke in Fl. Brit. India 4 : 234. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 371. 1939.

Spiny, under shrubs ; barks grey    hirsute, recurved prickly.  
Flowers few in lateral racemes, greenish    white or yellowish.

*Fl. & Fr.* : July    March.

22    32 km on M.V. road, 83615 ; Jairampur forest, 88653 ; Gandhigram, 99688.

*Distrib.* : INDIA : North    east India; Western Ghats.

*Solanum spirale* Roxb., Hort. Beng. 16. 1814, & Fl. Ind. 556. 1820 ; C.B. Clarke in Fl. Brit. India 4 : 230. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 367. 1939.

*Asm.* : *Tita kucli*.

Under shrubs; stem erect with 1 or 2 sharp ridges. Flowers in dense spirally arranged extra - axillary racemes, small. Fruits orange - red, berry.

*Fl. & Fr.* : June    October.

19th mile, M.V. road, 85154 ; Deban forest, 88715 ; 40th mile, M.V. road, 79115 ; Kamlat    Krosam, 88013.

*Distrib.* : INDIA ; North    east India ; MALAYA.

*Solanum torvum* Sw., Prodr. 47. 1768 ; C.B. Clarke in Fl. Brit. India 4 : 234. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 369. 1939.

*Asm.* : *Bhi-tita*.

Shrubs with sparse prickles. Flowers in extra    axillary racemes, white. Fruits berry, yellow.

*Fl. & Fr.* : March    December.

Deban to Miao. 79046, 81229 ; 17th mile forest, 83746 ; Deban forest, 88638 & 99409.

*Distrib.* : INDIA : Throughout India ; CHINA, PHILIPPINES, MALAYA, AMERICA.

### SCROPHULARIACEAE

*Limnophila chinensis* (Obs.) Merr. in Philip. J. Bot. 3 : 581. 1916 ; Kanjilal *et al.*, Fl. Assam 3 : 379. 1939. *Columnnea chinensis* Obs., Dagbok. Ostind. Resa 230. 1757. *Limnophila hirsuta* Benth. in DC., Prodr. 10 : 388. 1846 ; Hook. f., Fl. Brit. India 4 : 268. 1884.

Erect small herbs, hirsute. Leaves 1-3 × 0.5-1.3 cm, linear-oblong or elliptic, sub-spathulate, serrulate, short petioled. Flowers solitary, axillary, or in panicles, greenish-brown or brownish-white. Capsule oblong.

*Fl. & Fr.* : September-January.

M.V. road, in between Miao to Deban, 83726.

*Distrib.* : INDIA : North-east India, Western Ghats, Andaman Islands ; BANGLA DESH, SRI LANKA, CHINA, BORNEO.

*Limnophila indica* (L.) Druce in Rep. Bot. Exch. Club. Brit. Is. 3 : 420. 1914 ; Kanjilal *et al.* Fl. Assam 3 : 379. 1939. *Hottonia indica* L., Syst. Nat. (ed. 10) 919. 1759. *Limnophila gratioloides* R. Br. ; Hook. f., Fl. Brit. India 4 : 271. 1884.

Herbs slender, glabrous. Leaves at apices, pinnatifid in whorls, decussate. Flowers solitary, axillary, whitish or yellowish-white.

*Fl. & Fr.* : July-October.

On the way to Bordumsa, 88229.

*Distrib.* : INDIA : Throughout India ; CHINA, MALAYA, AFRICA.

*Lindernia cordifolia* (Colson.) Merr., Enum. Philip. Pl. 3 : 437. 1923 ; Joseph, Fl. Nongpoh 191. 1981. *Gratiola cordifolia* Colson. Prodr. Desc. Grat. 15. 1793. *Vandellia pedunculata* Benth. ; Hook. f., Fl. Brit. India 4 : 282. 1884. *Lindernia anagallis* (Burm. f.) Pennell in J. Arnold Arb. 24 : 252. 1934 ; Philcox in Kew Bull. 22 : 45. 1968. *Ruellia anagallis* Burm. f., Fl. Ind. 135. 1768.

Herbs prostrate, slender, glabrous; rooting at base. Leaves 10-15 × 3-5 mm, ovate to lanceolate, rounded at base, crenate. Flowers solitary, axillary, purplish blue or pinkish ; pedicels twice or more long than the leaves.

*Fl. & Fr.* : July-December.

Miao forest, 83104.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, CHINA, BORNEO.

*Lindernia montana* (Blume) Koord. Exk. Fl. Java 3 : 178. 1912 ; Philcox in Kew Bull. 22 : 44. 1966. *Diceros montanus* Blume, Bijdr. 752. 1826. *Vandellia mollis* Benth., Scroph. Ind. 36. 1835 ; Hook. f., Fl. Brit. India 4 : 281. 1884.

Herbs, prostrate ; branches slender, rooting at lower nodes. Leaves 2-3 × 1-1.5 cm, lanceolate to oblong, densely villous on both surfaces. Flowers solitary axillary or in short racemes, yellowish white, calyx densely villous hirsute.

*Fl. & Fr.* : July - November.

19th mile, M.V. road, 85153, 83696 ; 2 km towards M' Pen, 83182.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; BANGLADESH, CHINA.

*Lindernia ruelloides* (Colsm.) Pennell in Brittonia 2 : 1182. 1936 ; Mukherjee in J. Ind. bot. Soc. 24 (3) : 133. 1954 ; Deb, Fl. Tripura 2 : 276. 1983. *Gratiola ruelloides* Colsm., Prodr. Desc. Gratiola 12. 1793. *Bonaya reptans* Sprengel, Syst. 1 : 410. 1825 ; Hook. f., Fl. Brit. India 4 : 284. 1884.

Small prostrate herbs, creeping. Leaves opposite, petiolate, obovate-oblong, serrate, red. Flowers in racemes, white. Fruits slender capsule, ca 2.5 cm long.

*Fl. & Fr.* : October - February.

10 km away from Deban, 83640.

*Distrib.* : INDIA : North-east and South India ; MYANMAR, JAVA, PHILIPPINE ISLANDS.

*Mazus pumilus* (Burm. f.) van Steenis in Nov. Guinea n.s. 9 : 31. 1958 ; Balakr., Fl. Jowai 2 : 337. 1983. *Lobelia pumila* Burm. f., Fl. Ind. 186, t. 80, f. 3. 1768. *M. rugosus* Lour., Fl. Cochinch. 385. 1790 ; Hook. f., Fl. Brit. India 4 : 259. 1884.

Small herbs with tufted ascending stems. Leaves 1.8-6 × 0.8-1.2 cm, obovate, upper leaves obovate-spathulate, cuneate at base, obtuse apex, crenate dentate. Flowers in long racemes, violet or white with 2 yellow spots inside. Fruits ca 3 mm.

*Fl. & Fr.* : April - December.

27th mile, M.V. road, 87980.

*Distrib.* : INDIA : Throughout India at high elevations ; BHUTAN, CHINA, JAVA, JAPAN, AFGHANISTAN.

*Torenia asiatica* L., Sp. Pl. 619. 1753 ; Hook. f., Fl. Brit. India 4 : 277. 1884, p.p. ; Dutta in Bull. Bot. Soc. Beng. 19 (1) : 25. 1966.

Small diffuse herbs, creeping. Leaves shortly petioled, 2-5 × 1-2 cm, lanceolate, ovate-cordate, serrate, glabrous or puberulous. Flowers solitary or sub-umbellate, pink or violet.

*Fl. & Fr.* : April- October.

25th mile, 87910 ; Deban forest, 84930.

*Distrib.* : INDIA : Arunachal Pradesh, Western Ghats ; MYANMAR, CHINA, JAVA.

*Torenia diffusa* D. Don, Prodr. Fl. Nep. 86. 1825 ; Balakr., Fl. Jowai 2 : 338. 1983. *T. vagans* Roxb., Fl. Ind. 3 : 96. 1832 ; Hook. f., Fl. Brit. India 4 : 277. 1884.

Decumbent herbs ; rooting at nodes. Leaves 2-3 × 1-2 cm, oblong or oblong-ovate, sub-obtuse, serrate. Flowers in axillary racemes, bluish-white with blotch inside. Capsule linear, ca 1 cm.

*Fl. & Fr.* : July- December.

20 km forest, M.V. road, 83179 ; Left bank of Deban nala, 85107.

*Distrib.* : INDIA : Throughout India at high altitudes; NEPAL, BANGLA DESH, CHINA.

### GESNERIACEAE

*Aeschynanthus acuminata* Wallich ex. DC., Prodr. 9 : 263. 1845 ; C.B. Clarke in Fl. Brit. India 4 : 341. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 391. 1939.

Slender epiphytes, glabrous. Leaves 4-10 × 2-4 cm, elliptic, cuneate at base, acuminate. Flowers few in axillary cymes, yellowish-green.

*Fl. & Fr.* : October- March.

Kamlat to Walap, 87996 ; Gandhigram, 99651.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; BHUTAN, SINGAPORE.

*Aeschynanthus bracteatus* Wallich ex DC., Prodr. 9 : 261. 1845 ; Matthew, Fl. Pl. Kurseong 74. 1981. *A. hookeri* C.B. Clarke in DC. Monogr. Phan. 5 : 91. 1883 & in Fl. Brit. India 4 : 338. 1884 ; Kanjilal *et al.* Fl. Assam 3 : 388. 1939.

Epiphytic undershrubs, pendulous. Flowers in terminal umbels, scarlet red. Fruit very long capsule.

*Fl. & Fr.* : June December.

22 32 km from Miao on M.V. road, 93656.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Aeschyanthus gracilis** Parish ex C.B. Clarke, *Conn. & Cyrt. Beng.* t. 48. 1874. & C.B. Clarke in *Fl. Brit. India* 4 : 340 1883 ; Kanjilal *et al.*, *Fl. Assam* 3 : 390. 1939.

Epiphytic herbs ; branches slender, pubescent. Flowers in terminal or axillary cymes, scarlet red. Fruits a long capsule.

*Fl. & Fr.* : September February.

Namdapha river side, 79134.

*Distrib.* : INDIA : Sikkim, North-east India ; MYANMAR, MALAYA.

**Aeschynanthus ramosissima** Wallich, *Pl. Asiat. Rar.* 1. 55, t. 71. 1830 ; C.B. Clarke in *Fl. Brit. India* 4 : 339. 1883.

Epiphytic herbs ; glabrous except the corolla. Flowers in terminal or axillary cymes, in clustered, reddish. Fruits long capsule.

*Fl. & Fr.* : July December.

East of Deban, 85082.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh ; NEPAL.

**Aeschynanthus superba** C.B. Clarke, *Conn. & Cyrt. Beng.* t. 46. 1874 & C.B. Clarke in *Fl. Brit. India* 4 : 342. 1884 ; Kanjilal *et al.*, *Fl. Assam* 3 : 391. 1939.

Giant, stout epiphytes. Leaves elliptic oblong, acute or acuminate. Flowers umbellate, terminal or on old wood, brick red with persistent bracts ; calyx reddish ; corolla oblique at mouth.

*Fl. & Fr.* : August February.

Salt lick forest, 83567, 27th mile, 84984.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Boeica filiformis** C.B. Clarke, *Conn. & Cyrt. Beng.* t. 85. 1874 ; C.B. Clarke in *Fl. Brit. India* 4 : 362. 1883 ; Kanjilal *et al.*, *Fl. Assam* 3 : 398. 1939.



Tall herbs or under shrubs, nearly glabrous. Flowers solitary or in cymes ; branches of inflorescence filiform, purplish. Young fruits greenish with pink tinge.

*Fl. & Fr.* : February    October.

Near Deban, 85049, 88649 ; Hornbill, 87704.

*Distrib.* : INDIA : North - east India ; BHUTAN.

*Boeica fulva* C.B. Clarke, *Conn. & Cyrt. Beng.* t. 85. 1874 & in *Fl. Brit. India* 4 : 362. 1883 ; Kanjilal *et al.*, *Fl. Assam* 3 : 398. 1939.

Herbs small. Leaves dull bluish green above, pinkish beneath. Flowers in dichotomous cymes, hirsute, pinkish.

*Fl. & Fr.* : June    October.

21 km to Deban from Miao, 81111.

*Distrib.* : INDIA : Arunachal Pradesh ; BHUTAN.

*Chirita mishmiensis* Debb. & Biswas in Kanjilal *et al.*, *Fl. Assam* 3 : 396. 1939.

Low herbs, with very small root stock. Leaves hirsute. Flowers in axillary cymes, single flowered, bluish turning to yellowish.

*Fl. & Fr.* : April    October.

27th mile forest, 87882.

*Distrib.* : INDIA : Arunachal Pradesh.

*Chirita oblongiflora* (Roxb.) Sinclair in *Bull. Bot. Soc. Beng.* 9 : 102. 1957 ; Balakr., *Fl. Jowai* 2 : 347. 1983. *Incarvillea oblongifolia* Roxb., *Fl. Ind.* 3 : 113. 1382. *Chirita acuminata* R. Br. in *Ann. Sci. Nat. Ser.* 2 : 13. 161. 1840 ; C.B. Clarke in *Fl. Brit. India* 4 : 359. 1884 ; Kanjilal *et al.*, *Fl. Assam* 3 : 396. 1939.

Tall herbs or undershrubs, unbranched, villous above. Leaves sub-equal, elliptic or ovate, acuminate at apex. Flowers in axillary cymes, white with violet tinge.

*Fl. & Fr.* : September    December.

M' Pen check gate    Deban, 83188 ; South bank of Noa    Dihing river near Deban, 85142.

*Distrib.*: INDIA : Arunachal Pradesh, Assam, Meghalaya ; BANGLA DESH.

**Loxostigma griffithii** (Wight) C.B. Clarke in DC., Mem. Phan. 5 : 60. 1883 ; C.B. Clarke in Fl. Brit. India 4 : 344. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 394. 1939. *Didymocarpus griffithii* Wight, Ill. Ind. Bot. 2 : 182. t. 159. 1850.

Erect tall herbs, pubescent all over. Flowers in lax cymes, yellowish.

*Fl. & Fr.* : October - February.

20th mile forest, 86666.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Lysionotus atropurpurea** Hara in J. Jap. Bot. 48 : 358. f. 4. 1973 & Enum. Fl. Pl. Nepal 3 : 135. 1982. *L. serrata non* D. Don ; C.B. Clarke in Fl. Brit. India 4 : 344. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 393. 1939.

Herbs, lithophytic. Flowers in lax, many flowered cymes, purple or white with purplish nerves. Fruits capsule, reddish brown.

*Fl. & Fr.* : July - February.

Deban forest, 79095 ; Firmbase, 83711 ; On way to Deban, 85077 ; Krosun, 88027.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh ; NEPAL.

**Rhynchoglossum obliquum** Blume, Bijdr. 741. 1826 ; C.B. Clarke in Fl. Brit. India 4 : 367. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 398. 1939.

Fleshy herbs. Flowers in long racemes, bilabiate, blue or bluish pink. Fruits ellipsoid capsule.

*Fl. & Fr.* : July - December.

22 km onwards M' Pen, 83183 ; Deban Forest, 85039 ; 19th mile forest, 85152.

*Distrib.* : INDIA : North east India ; MYANMAR, MALAYA.

**Rhynchotechum ellipticum** (Wallich ex Dietr.) A. DC. in DC., Prodr. 9 : 285. 1845 ; C.B. Clarke in Fl. Brit. India 4 : 373. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 399. 1939. *Corysanthera elliptica* Dietr., Syn. Pl. 3 : 582. 1843.

Shrubs ; young parts downy tomentose. Flowers in trichotomously paniculate cymes, pinkish white. Fruits berry.

*Fl. & Fr.* : June February.

M' Pen chack gate, 83157 ; Deban, 79002, 81055 ; 22 km to Deban I.B. 83525, 83545 ; Haldibari, 99472.

*Distrib.* : INDIA : North-east India ; BANGLA DESH, BHUTAN.

**Rhynchotechum vestitum** C.B. Clarke, *Conn. & Cyrt. Beng.* 132. t. 92. 1874 & Hook. f., *Fl. Brit. India* 4 : 373. 1884 ; Kanjilal *et al.*, *Fl. Assam* 3 : 399. 1939.

Tall herbs or under shrubs densely villous. Flowers in trichotomously paniculate cymes, pinkish. Fruits berry, white.

*Fl. & Fr.* : August February.

27th mile on M.V. road, 84961.

*Distrib.* : INDIA : North east India ; BHUTAN.

**Tetraphyllum bengalense** C.B. Clarke in *Fl. Brit. India* 4 : 363. 1884 ; Burkill in *Rec. Bot. Surv. India* 10 (2) : 330. 1925.

Slightly woody herbs, stem *ca* 28 cm, woolly. Leaves usually 2 pairs rarely three, oblique, acute, glabrous above silky beneath. Flowers in cymes, blue. Fruits capsule.

*Fl. & Fr.* : June November.

33 mile, M.V. road, 87643.

*Distrib.* : INDIA : Arunachal Pradesh, Assam ; BANGLA DESH.

### BIGNONIACEAE

**Oroxylum indicum** (L.) Vent., *Dec. Gen. Nor.* 8. 1808 ; C.B. Clarke in *Fl. Brit. India* 4 : 378. 1884 ; Kanjilal *et al.*, *Fl. Assam* 3 : 401. 1939. *Signonia indica* L., *Sp. Pl.* 625. 1753.

*Asm.* : *Paroli.*

Small or middle sized trees, bark greyish, corky. Flowers in long terminal racemes, purplish or yellowish. Pods black, drooping.

*Fl. & Fr.* : June February.

Nampong forest, 88733.

*Distrib.* : INDIA : Throughout India ; MALAYA.

**Radermachera glandulosa** (Blume) Miq., Ann. Bot. Lugd. Bot. 3 : 250. 1867 ; Van Steenis, Fl. Malesiana 8(2) : 152. 1977. *Spathodea glandulosa* Blume, Bijdr. 762. 1826. *Stereospermum glandulosum* Miq., Suppl. 240. 565. 1860 ; C.B. Clarke in Fl. Brit. India 4 : 383. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 404. 1939.

Large trees ; branches spreading. Leaves imparipinnate. Flowers white, tinged with pink in few flowered terminal or axillary panicles. Fruits slender capsule.

*Fl. & Fr.* : February May.

Namgoi, 88257.

*Distrib.* : INDIA : North east India ; MYANMAR, MALAYA.

**Stereospermum colais** (Buch. Ham. ex Dillw.) Mabberley in Taxon 27 : 553. 1978. *Bignonia colais* Buch. Ham. ex Dillw., Rev. Ref. Hort. Mal. 28. 1839. *S. chelonoides sensu* C.B. Clarke in Fl. Brit. India 4 : 382. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 404. 1939. *Stereospermum personatum* (Hassk.) Chatterjee in Bull. Bot. Soc. Beng. 2 : 70. 1948.

*Asm* : Dhapatita.

Large trees, bark brown corky, wood grey hard. Flowers in lax terminal panicles, yellowish with purplish tinge at the throat. Fruits long, spirally twisted capsule.

*Fl. & Fr.* : April October.

Rajnagar forest, 88227.

*Distrib.* : INDIA : Throughout moist parts of India ; MYANMAR, SRI LANKA, SOUTH EAST ASIA.

## ACANTHACEAE

**Acanthus leucostachys** Nees in Wallich, Pl. Asiat. Rar. 3 : 98. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 480. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 440. 1939.

Tall perennial herbs or decumbent, villous, under shrubs. Leaves 10-20 × 3-5 cm, ovate to elliptic-oblong, margins irregularly sinuate or not, hairy beneath ; spikes terminal, solitary, hairy. Flowers yellowish with violet blotch inside to whitish. Fruits ellipsoid capsule.

*Fl. & Fr.* : November June.

34th mile, M.V. road, 87622.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Manipur, Tripura, Meghalaya.

*Diflugossa colorata* (Nees) Bremek. in Nederl. Akad. Wet. Verh. 41 (1) : 237. 1944 ; Joseph, Fl. Nongpoh 197. 1981. *Goldfussia colorata* Nees in Wallich, Pl. Asiat. Rar. 3 : 89. 1832. *Strobilanthes colorata* (Nees) T. Anderson. in J. Linn. Soc. 9 : 481. 1867 ; C.B. Clarke in Fl. Brit. India 4 : 473. 1844 ; Kanjilal *et al.*, Fl. Assam 3 : 434. 1939.

Tall herbs or under shrubs. Leaves in unequal pairs, 5 16 × 3.5 6 cm, ovate to elliptic lanceolate, acuminate, crenate serrate, glabrous. Flowers in terminal, large, lax, cymose panicles, purplish. Fruit 4 seeded capsule.

Fl. & Fr. : August February.

Namdapha road cutting, 85041.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BHUTAN.

*Goldfussia discolor* Nees in DC., Prodr. 11 : 172. 1847 ; Balakr., Fl. Jowai 2 : 355. 1983. *Strobilanthes discolor* (Nees) T. Anderson in J. Linn. Soc. 9 : 477. 1867 ; C.B. Clarke in Fl. Brit. India 4 : 462. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 426. 1939.

Small shrubs, petiole *ca* 0.5 cm long. Flowers in panicle of cymose heads, pinkish violet.

Fl. & Fr. : June December.

Tulung Kunung, 87958.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; BHUTAN.

*Goldfussia glabrata* (Nees) Balakr., Fl. Jowai 2 : 355. 1983. *Strobilanthes glabratus* Nees in Wallich, Pl. Asiat. Rar. 3 : 85. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 447. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 420. 1939.

Shrubs *ca* 2.5 m tall. Leaves 2.5 10 × 2 5 cm, elliptic, cuneate at base, acuminate, serrulate, glabrous. Flowers in ovoid pedunculate heads ; bracts white or pale greenish white ; corolla white. Capsule *ca* 2 cm ; seeds silky hairy.

Fl. & Fr. : December June.

West of 40th mile, 87684.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

*Hygrophila erecta* (Burm. f.) Hochr. in Candollea 5 : 230, 1934. *Ruellia erecta* Burm. f., Fl. Ind. 135, 1784. *Hygrophila quadrivalis* Nees in Wallich, Pl. Asiat. Rar. 3 : 80, 1832 ; C.B. Clarke in Fl. Brit. India 4 : 408, 1885.

Erect herbs. Leaves elliptic or lanceolate, tapering at both ends, undulate on margins. Calyx deeply lobed. Capsule longer than calyx, linear many seeded.

*Fl. & Fr.* : June - October.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYA.

*Hygrophila salicifolia* (Vahl) Nees in Wallich, Pl. Asiat. Rar. 3 : 81, 1832 ; C.B. Clarke in Fl. Brit. India 4 : 407, 1884 ; Balakr., Fl. Jowai 2 : 351, 1983. *Ruellia salicifolia* Vahl, Symb. Bot. 3 : 84, 1794.

Tall herbs or under shrubs, often rooting at lower nodes, glabrous. Leaves 2.8 - 1.0 × 1.2 - 2 cm, lanceolate, acute at both the ends, glabrous. Flowers in axillary clusters, pale - purple, blue or violet with purple streaks. Capsule ca 1 cm diam.

*Fl. & Fr.* : August - December.

Left bank of Deban nala, 85106.

*Distrib.* : INDIA : Throughout India ; SRI LANKA.

*Hypoestis triflora* (Frossk.) Roem. & Schult., Syst. Veg. 1 : 141, 1817 ; C.B. Clarke in Fl. Brit. India 4 : 557, 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 540, 1939. *Justicia triflora* Frossk., Fl. Aegypt. Arb. 4, 1775.

var. *triflora*.

Tall herbs, up to 50 cm. Leaves 2 - 7 × 1 - 4 cm, ovate, acute or sub acute at base, acuminate, sparsely hairy above. Flowers in clusters of 3, in axillary or terminal heads or umbels, yellowish or pale pinkish white. Capsule ellipsoid.

*Fl. & Fr.* : October - January.

22 - 32 km from Miao I.B., 83604.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MALAYA.

*Lepidagathis incurva* Buch.-Ham. ex D. Don, Prodr. Fl. Nep. 119, 1825 ; Kanjilal *et al.*, Fl. Assam 3 : 451, 1939. *L. hyalina* Nees

in Wallich, Pl. Asiat. Rar 3 : 95. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 521. 1885. *L. riparia* Nees in DC., Prodr. 11 : 253. 1847.

Herbs much branched. Leaves variable in shape, ovate, oblong, undulate or entire. Flowers white with brown spots, in dense spikes. Capsules oblong, with a short beak.

*Fl. & Fr.* : November April.

Miao to Deban, 98059.

*Distrib.* : INDIA : Northern & North east India ; NEPAL, BHUTAN, CHINA.

**Phlogacanthus asperulus** Nees in Wallich, Pl. Asiat. Rar. 3 : 99. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 512. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 444. 1939.

Small shrubs ; petioles *ca* 2.5 cm long. Flowers in linear spikes, violet red ; corolla curved and inflated at mouth.

*Fl. & Fr.* : March July.

17th mile area, 83747.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

**Phlogacanthus curviflorus** Nees in Wallich, Pl. Asiat. Rar. 3 : 99. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 511. 1884. Kanjilal *et al.*, Fl. Assam 3 : 443. 1939.

Shrubs up to 3 m high. Leaves 20 30 x 10 20 cm, obovate, broadly oblanceolate elliptic, cuneate at base, obtuse or acute. Flowers *ca* 5 cm long, red, in long spikes. Capsules *ca* 6 cm long.

*Fl. & Fr.* : October April.

Gandhigram, 99567.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

**Phlogacanthus guttatus** Nees in Wallich, Pl. Asiat. Rar. 3 : 99. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 512. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 443. 1939.

Shrubs up to 2 m high. Leaves 7 20 x 2 5 cm, elliptic, elliptic lanceolate, attenuate at base, acuminate. Flowers *ca* 2.5 cm long, yellowish green, in axillary and terminal spikes. Capsules *ca* 3 cm oblanceolate.

*Fl. & Fr.* : November March.

*Distrib.* : INDIA : North east India.

**Phlogacanthus parviflorus** T. Anderson in J. Linn. Soc. 9 : 506. 1867 ; C.B. Clarke in Fl. Brit. India 4 : 512. 1884.

Tall herbs or shrubs ; petiole *ca* 2 cm long. Flowers in terminal or axillary panicles, pinkish.

*Fl. & Fr.* : December - June.

Deban forest, 83589.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland.

**Phlogacanthus tubiflorus** Nees in Wallich, Fl. Asiat. Rar. 3 : 99. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 511. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 443. 1939.

*Asm.* : *Bhatia tita*.

Small, shrubs ; young parts tomentose. Flowers in dense spikes, curved, deep red.

*Fl. & Fr.* : January - May.

Deban forest, 88291 ; Glao lake, 99484.

*Distrib.* : INDIA : North - east India.

**Pseuderanthemum indicum** (Nees) A. M. & J. M. Cowan, Trees Bengal 98. 1929 ; Kanjilal *et al.*, Fl. Assam 3 : 448. 1939. *Thyrsacanthus indicus* Nees in DC., Prodr. 9 : 325. 1845. *Eranthemum indicum* (Nees) C.B. Clarke in Fl. Brit. India 4 : 497. 1884.

Small shrubs, diffusely branched ; branches brownish, glabrous. Leaves 8 - 12 × 3 - 5 cm, elliptic lanceolate, acuminate, entire. Flowers in terminal lax racemes, white with purple veins. Fruits cylindric, capsule *ca* 2.5 cm in diam.

*Fl. & Fr.* : March - May.

10th mile forest, 87780.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ; BHUTAN.

**Pseuderanthemum palatiferum** (Nees) Radlk. in Sitz. K. Bayer Akad. Wilo. 13 (2) : 287. 1883 ; Kanjilal *et al.*, Fl. Assam 3 : 449. 1939. *Eranthemum palatiferum* Nees in Wallich, Pl. Asiat. Rar. 3 : 108. 1832 ; C.B. Clarke in Fl. Brit. India 4 : 498. 1884.

Tall herbs or under shrubs, pubescent when young. Leaves 6 - 20 × 2 - 6 cm, elliptic to oblanceolate, oblique at base, acuminate, entire. Flowers in clusters on long simple or branched axils, purple. Capsule *ca* 2.5 cm in diam.

*Fl. & Fr.* : March - April.



South bank of Noa Dihing at 20th mile point, 85027.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam Meghalaya ; BHUTAN.

**Pteracanthus nobilis** (C.B. Clarke) Bremck. in Verh. Ned. Akad. Wet. Afd. Nat. Sect. 2. 41 (1) : 199. 1944 ; Balakr., Fl. Jowai 2 : 357. 1983. *Strobilanthes nobilis* C.B. Clarke in Fl. Brit. India 4 : 471. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 432. 1939.

Small much branched shrubs. Leaves 10–20 × 3–7 cm, elliptic, lanceolate, cuneate at base, acute or acuminate, glabrous beneath. Flowers in axillary paniced spikes, purple. Capsule ca 2 cm in diam.

*Fl. & Fr.* : October–April.

23 km from Miao on M.V. road, 83502.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Strobilanthes secundus** T. Anderson in J. Linn. Soc. 9 : 840. 1867 ; C. B. Clarke in Fl. Brit. India 4 : 468. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 429. 1939.

Erect herbs or shrubs. Leaves opposite, lanceolate, dark green, petiole ca 1 cm long. Flowers in axillary and terminal, lax long spike, in clusters, pink–yellow.

*Fl. & Fr.* : December–March.

22–32 km from Miao, 83617 ; Deban forest, 88624 & 99407.

*Distrib.* : INDIA : North-east India.

**Sympagis petiolaris** (Nees) Bremek. in Verh. Ned. Akad. Weterns. Sect. 2, 41 (1) : 255. 1944 ; Srinivasan & Agarwal in Bull. Bot. Surv. India 5 : 85. 1963. *Strobilanthes petiolaris* Nees in DC., Prodr. 11 : 185. 1847 ; C.B. Clarke in Fl. Brit. India 4 : 458. 1884.

Shrubs. Leaves ovate, acuminate, glabrous above, hairy beneath. Flowers in paniced spikes, purplish or violet. Fruits hairy.

*Fl. & Fr.* : June–December.

29th mile, 86620, \*88603.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, BHUTAN.

#### THUNBERGIACEAE

**Thunbergia coccinea** Wallich, Tent. Fl. Nep. 49 : 58. t. 37. 1824 ; C. B. Clarke in Fl. Brit. India 4 : 393. 1884 ; Kanjilal *et al.*, Fl. Assam 3 : 411. 1939.

Asm. : *Chonga lota*.

Extensive climbers with pendant branches. Flowers in long racemes, orange red with light blue tinge

*Fl. & Fr.* : November - May.

Miao forest, 83108 ; Happy valley, 83783. Haldibari, 99417 ; P. Kund, 99516.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; BHUTAN.

### VERBENACEAE

*Callicarpa arborea* Roxb., *Fl. Ind.* 4 : 405. 1820 ; C. B. Clarke in *Fl. Brit. India* 4 : 567. 1885 ; Kanjilal *et al.*, *Fl. Assam* 3 : 463. 1939.

*Asm.* : *Bonmola*.

Large shrubs or small trees ; bark dark grey or brown. Flowers in corymbose cymes, pinkish purple. Fruits globose drupe, purple.

*Fl. & Fr.* : Nearly throughout the year.

Deban forest, 79153 ; Miao forest, 81120, 83118 ; Namchick M.V. road, 88237 ; 22 - 32 km from Miao to Deban, 83616 ; Tihun village, 99500 ; M.V. road, 99542.

*Distrib.* : INDIA : North-east India ; MALAYA.

*Callicarpa rubella* Lindley, *Bot. Reg.* t. 883. 1825 ; C. B. Clarke in *Fl. Brit. India* 4 : 569. 1885 ; Kanjilal *et al.*, *Fl. Assam* 3 : 464. 1939.

Erect shrubs up to 1.5 m high. Leaves 7 - 14 x 2 - 5 cm, oblong lanceolate, oblong elliptic, rounded or truncate at base, acuminate. Flowers ca 2 mm long, pink, in corymbose cymes. Fruits ca 3 mm across, purplish.

*Fl. & Fr.* : June - January.

Gandhigram, 99606.

*Distrib.* : INDIA : North east India ; INDO CHINA.

*Caryopteris foetida* (D. Don) Thellung in *Viert. Nat. Ges. Zurich* 64 : 782. 1919 ; Balakr., *Fl. Jowai* 2 : 336. 1983. *Clerodendrum foetidum* D. Don, *Prodr. Fl. Nep.* 103. 1825. *Caryopteris grata* (Schauer) Benth., *Gen. Pl.* 2 : 1158. 1876 ; C. B. Clarke in *Fl. Brit. India* 4 : 597. 1885.

Shrubs, rambling ca 3 m tall ; branches puberulous. Leaves 6 - 12 x 2 - 5 cm, elliptic, rhomboid, rounded at base, acute. Flowers in axillary, corymbose cymes, white or violet. Fruits globose capsule, yellow when ripe.

*Fl. & Fr.* : April - October.

Near Burma nala, 87930.

*Distrib.*: INDIA ; Sikkim, Uttar Pradesh, Arunachal Pradesh, Meghalaya ; NEPAL.

**Clerodendrum bracteatum** Wallich ex Walp., Rep. 4 : 114. 1845 ; C.B. Clarke in Fl. Brit. India 4 : 593. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 484. 1939.

Shrubs, 3.5 m tall, with ash coloured bark. Leaves 8 20 × 3.5 11 cm, ovate, truncate or shallow cordate at base, acuminate, entire. Flowers in capitate cymes, greenish white ; calyx deep red in fruits. Fruits globose, bluish purple.

*Fl. & Fr.* : August December.

19th mile, M.V. road, 85157 ; 27th mile camp, 87974 ; Gandhigram, 99681.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Tripura, Meghalaya ; BHUTAN.

**Clerodendrum colebrookianum** Walp., Rep. 4 : 114. 1845 ; C.B. Clarke in Fl. Brit. India 4 : 594. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 488. 1939.

Large shrubs, ca 3 m tall. Leaves 10 25 × 6 8 cm, broadly ovate, shallowly cordate at base, acute. Flowers in compact corymbose panicles, snow white. Fruits ca 1 cm diam, greenish blue, with accrescent, cupular calyx.

*Fl. & Fr.* : August December.

Miao Deban road, 83117 ; Miao forest, 98164 ; On the way to Vijoyagar, 99540.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, MALAYA.

**Clerodendrum divaricatum** Jack., Mal. Misc. 1 : 48. 1820 ; Deb, Fl. Tripura 2 : 106. 1983. *C. serratum* Sprengel, Syst. Veg. 2 : 758. 1825 ; C. B. Clarke in Fl. Brit. India 4 : 592. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 490. 1939.

Small shrubs. Leaves 7 26 × 2 12 cm, sub sessile, oblanceolate or ovate oblong, narrowed to the petioles, acuminate, serrate, Flowers in panicles of cymes, reddish white. Drupes ca 1 cm black.

*Fl. & Fr.* : August June.

Deban forest, 85072 ; 27th mile camp, 84958.

*Distrib.* : INDIA : North-east India ; SRI LANKA, VIETNAM, MALAYSIA.

**Clerodendrum hastatum** (Roxb.) Lindley in Edgew. Bot. Reg. 16 : t. 1370. 1830 ; C.B. Clarke in Fl. Brit. India 4 : 959. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 493. 1939. *Siphonanthus hastata* Roxb., Fl. Ind. 3 : 67. 1832.

Large shrubs. Leaves often in unequal pairs, 5-16 × 2.5-14 cm, ovate to oblong, truncate at base, acute or acuminate, often purplish beneath. Flowers in dense corymbs, white or creamy yellow. Drupes ca 1 cm purplish-black.

*Fl. & Fr.* : May-December.

Salt lick forest, 81162.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ;  
BANGLA DESH.

**Clerodendrum lasiocephalum** C.B. Clarke in Fl. Brit. India 4 : 594. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 489. 1939.

Gregarious shrubs ; branchlets pubescent. Leaves 5-18 × 5-16 cm, ovate to lanceolate, shallowly cordate at base, acuminate. Flowers in compact capitata, white ; calyx reddish in fruits. Drupes ca 1 cm red.

*Fl. & Fr.* : May-December.

20 km onwards from M' Pen, 83198 ; M.V. road, 99536.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Clerodendrum villosum** Blume, Bijdr. 811. 1826 ; C.B. Clarke in Fl. Brit. India 4 : 595. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 488. 1939.

Tall shrubs, gregarious, villous. Leaves 8-20 × 5-17 cm, ovate, acuminate, entire, villous. Flowers in terminal, panicles, tomentose, whitish or greenish-white. Capsule ca 1 cm diam., blackish.

*Fl. & Fr.* : January-June.

Miao-Deban road, 79038.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland ; JAVA, MALAYA.

**Clerodendrum wallichii** Merr. in J. Arn. Arb. 33 : 220. 1952 ; Balakr., Fl. Jowai 2 : 369. 1983. *C. mutans* Wallich ex D. Don, Prodr. 103. 1825 non Jack ; C.B. Clarke in Fl. Brit. India 4 : 591. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 491. 1939.

*Asm.* ; *Bon thesabupl.*

Shrubs or small trees ; bark dark brown or reddish-brown. Flowers in thyrsoid panicles, usually drooping, white with pungent

smell. Fruits deep purple, supported by red calyx.

*Fl. & Fr.* : September March.

Jairampur forest, 81195 ; Miao to Deban, 79140 ; Shirong to Hanung, 88090 ; Gandhigram, 99697.

*Distrib.* : INDIA : North east India ; MYANMAR.

*Gmelina arborea* Roxb., Hort. Beng. 46. 1914 ; C.B. Clarke in Fl. Brit. India 4 : 581. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 466. 1939.

*Asm.* : Gomori.

Medium size, deciduous trees. Leaves 7 - 20 × 6 - 14 cm, broadly ovate, rhomboid at base, long petioled, glaucous beneath. Flowers in clusters, yellowish brown ; corolla pubescent. Drupe succulent, yellow pulp aromatic.

*Fl. & Fr.* : February August.

Miao Deban road in the forest, 79223.

*Distrib.* : INDIA : Throughout India ; BANGLA DESH, MALAYSIA.

*Lantana camara* L. var. *aculeata* (L.) Moldenke in Bull. Torrey Bot. Club. 34 : 9. 1934 ; Balakr., Fl. Jowai 2 : 364. 1983. *L. aculeata* L., Sp. Pl. 627. 1753 ; Kanjilal *et al.*, Fl. Assam 3 : 460. 1939. *L. camara non* L., 1753 ; Prain, Bengal Pl. 825. 1903.

Erect bushy or straggling spiny shrubs ; bark grey or greyish brown. Flowers in capitate spike, pinkish or pinkish white.

*Fl. & Fr.* : Nearly throughout the year.

Nampong area in waste land, 88723.

*Distrib.* : INDIA : Almost naturalized throughout India ; Native of Tropical AMERICA.

*Premna milleflora* C. B. Clarke in Fl. Brit. India 4 : 576. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 475. 1939.

*Asm.* : Gohara.

Small trees with dense spreading crown ; bark grey or greyish brown. Flowers in pyramidal paniculate corymbs, yellow or yellowish white.

*Fl. & Fr.* : June December.

Miao forest, 81138.

*Distrib.* : INDIA : North east India.

## LAMIACEAE

*Achyrospermum densiflorum* Blume, Bijdr. 841. 1826. *A. wallichianum* (Benth.) Hook., f. Fl. Brit. India 4 : 673. 1885 ; Balakr., Fl. Jowai 2 : 382, 1983. *Teucrium wallichianum* Benth. in Wallich, Pl. Asiat. Rar. 2 : 19. 1831.

Herbs or undershrubs, creeping. Leaves 8-13 × 3-5 cm, elliptic-ovate, cuncate at base, acute to acuminate, serrate or crenate. Flowers in dense terminal axillary spikes, white or purple. Nutlets ellipsoid, trigonous.

*Fl. & Fr.* : September - January.

M' Pen check gate, 83152.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Tripura, Meghalaya ; MYANMAR.

*Clinopodium umbrosum* (Bieb.) Koch. in Linnea 21 : 673. 1848. *Melissa umbrosa* Bieb., Fl. Taur. Cauc. 2 : 63. 1808. *Calamintha umbrosa* (Bieb.) Benth. in DC., Prodr. 12 : 233. 1848 ; Balakr., Fl. Jowai 2 : 383. 1983. *Clinopodium repens* (D. Don) Benth., Lab. Gen. Sp. 392. 1836 ; Kanjilal *et al.*, Fl. Assam 3 : 517. 1939.

Much branched, slender herbs. Leaves 1-2 × 0.5-1.2 cm, ovate, rounded base, acute or obtuse, serrate. Flowers in dense or lax axillary whorls, bluish-pink. Nutlets subglobose, ca 1 mm, smooth.

*Fl. & Fr.* : September - February.

Miao to Deban road side, 79036.

*Distrib.* : INDIA : Kashmir to North-east India ; BHUTAN, MYANMAR.

*Elsholtzia blanda* (Benth.) Benth., Lab. Gen. Sp. 162. 1833 ; Hook. f., Fl. Brit. India 4 : 643. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 516. 1939. *Aphanochilus blanda* Benth. in Wallich, Pl. Asiat. Rar. 1 : 19. 1830.

Shrubs up to 1.5 m tall. Leaves 3-12 × 0.6-2.8 cm, elliptic-lanceolate, acute or cuneate at base, acuminate at apex. Flowers in axillary and terminal paniculate 7-20 cm long spikes, greenish-white. Fruits ca 2 cm long, ellipsoid.

*Fl. & Fr.* : October - April.

Gandhigram, 99618.

*Distrib.* : INDIA : West Bengal, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

**Gomphostemma parviflora** Wallich ex Benth. in Wallich, Pl. Asiat. Rar. 2 : 12. 1831 ; Hook. f., Fl. Brit. India 4 : 697. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 528. 1939.

Small shrubs ; stems dense tomentose. Leaves 12 30 × 3 10 cm, acuminate, serrate. Flowers axillary, yellow or yellowish orange. Nutlets ellipsoid, brown.

*Fl. & Fr.* : August - December.

27th mile forest, 86638 ; M' Pen check gate, 83162 ; Zero camp, 84914.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Tripura, Meghalaya ; NEPAL, BANGLA DESH, MYANMAR.

**Leucosceptum canum** Smith, Exct. Bot. 2 : 113 t. 116. 1805 ; Hook. f., Fl. Brit. India 4 : 699. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 529. 1939.

Tall shrubs or small trees up to 8 m high. Leaves 10 28 × 2 - 10 cm, elliptic or elliptic lanceolate, oblong elliptic, cuneate at base, acuminate. Flowers ca 2 cm long, yellowish white, in long spikes. Nutlets obovoid, brown.

*Fl. & Fr.* : October - March.

Gandhigram, 99665.

*Distrib.* : INDIA : Uttar Pradesh, North east India ; NEPAL, MYANMAR, CHINA.

**Mosla dianthera** (Buch.-Ham. ex Roxb.) Maxim. in Bull. Acad. St. Petersh. 20 : 457. 1878 ; Kanjilal *et al.*, Fl. Assam 3 : 517. 1939. *Lycopus dianthera* Buch. Ham. ex Roxb., Fl. Ind. 1 : 144. 1820.

Erect herbs, strongly aromatic. Leaves long petioled, 1 2 × 0.5 0.8 cm, ovate, cuneate at base, acute, serrate or dentate. Flowers in terminal lax flowered racemes, violet or bluish - purple. Nutlets ellipsoid.

*Fl. & Fr.* : September - December.

41st mile forest, 87698.

*Distrib.* : INDIA : Kashmir to North east India ; MYANMAR, CHINA.

*Melissa axillaris* (Benth.) Bakh. f. in Bock. & Bakh. f., Fl. Java 2 : 629. 1965 ; Balakr., Fl. Jowai 2 : 382. 1983. *Geniosporum axillare* Benth. in Wallich, Pl. Asiat. Rar. 2 : 18. 1831. *Melissa parviflora* Benth. in Wallich, Pl. Asiat. Rar. 1 : 65. 1830, non. Salisb. 1796 ; Hook. f., Fl. Brit. India 4 : 651. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 518. 1939.

Herbs up to 1 m high. Leaves 1 6 x 0.6 2.5 cm, elliptic lanceolate, ovate, acuminate or rounded at base, acute to acuminate. Verticillaster axillary, 4 6 flowered. Flowers ca 1 cm long, pinkish white. Nutlets ca 8 mm, obovoid.

*Fl. & Fr.* : June January.

Gandhigram, 99670.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, CHINA, TAIWAN, MALAYSIA.

*Orthosiphon wattii* Prain in J. Asiat. Soc. Beng. 66 : 520. 1897 ; Kanjilal *et al.*, Fl. Assam 3 : 503. 1939.

Erect herbs ; stem and leaves puberulous, quadrangular. Flowers in simple racemes, pinkish ; calyx persistent, puberulous.

*Fl. & Fr.* : August December.

Deban forest, 85038 ; 27th mile, 87744.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Manipur.

*Pogostemon benghalensis* (Burm. f.) Kuntze, Rev. Gen. Pl. 529. 1891 ; Murata in Fl. E. Himal. 3 : 95. 1975. *Ocimum benghalensis* Burm. f., Fl. Ind. 128, t. 38, f. 3. 1768. *Pogstemon plectranthoides* Desf. in Ann. Mus. Paris 2 : 155. 1875 ; Hook. f., Fl. Brit. India 4 : 632. 1885.

Spreading much branched herbs. Flowers in axillary and terminal spikes or verticillasters, pinkish white.

*Fl. & Fr.* : December June.

4th 31th mile, 79190.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR.

*Pogostemon brachystachys* Benth. in DC., Prodr. 12 : 156. 1848 ; Hook. f., Fl. Brit. India 4 : 637. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 512. 1939.

Small shrubs or straggling much branched herbs. Flowers in simple terminal racemes in dense flowered verticillasters, dull purplish or white with violet tinge.



*Fl. & Fr.* : July - December.

29th mile forest, 86628.

*Distrib.* : INDIA : North - east India ; MYANMAR.

**Pogostemon manthoides** Blume, Bijdr. 825. 1826. *P. fraternum* Miq., Fl. Ind. Bot. 2 : 963. 1859 ; Hook. f., Fl. Brit. India 4 : 635. 1885 ; Kanjilal *et al.*, Fl. Assam 3 : 512. 1939.

Straggling much branched herbs, hirsute. Flowers in long terminal or axillary racemes with close and distinct whorls or verticillasters, reddish - violet in fruits.

*Fl. & Fr.* : August - February.

Deban forest, 79159.

*Distrib.* : INDIA : Sikkim, North - east India ; MYANMAR, JAVA.

### PLANTAGINACEAE

**Plantago erosa** Wallich in Roxb., Fl. Ind. 1 : 423. 1820 ; Kanjilal *et al.*, Fl. Assam 3 : 531. 1939. *P. major non* L. 1753 ; Hook. f., Fl. Brit. India 4 : 705. 1885.

Perennial small herbs ; rootstock erect. Leaves alternate, radical, 3 - 9 × 1 - 3 cm, ovate - oblong to obovate, cuneate at base, acute or sub - acute at apex, entire or sinuately toothed. Flowers in long slender spikes, white. Capsules 1 - 4 celled, seeds 1 - 4, black.

*Fl. & Fr.* : April - December.

Miao to Deban road, 79096 & 98066.

*Distrib.* : INDIA : Throughout India ; Pantropic.

### AMARANTHACEAE

**Achyranthes aspera** L., Sp. Pl. 204. 1753 ; Hook. f., Fl. Brit. India 4 : 730. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 6. 1940.

Erect, tall herbs. Leaves 2 - 13 × 1 - 4 cm, ovate - obovate, acute or obtuse at base, acuminate, tomentose on both surface. Flowers in terminal spikes, greenish. Fruits easily disarticulating above the bracts.

*Fl. & Fr.* : July - December.

M' Pen check gate, 83135.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, Tropics of the World.

*Achyranthes bidentata* Blume, Bijdr. 545. 1825 ; Hook. f., Fl. Brit. India 4 : 370. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 7. 1940.

Erect herbs. Leaves 4 - 16 × 1 - 7 cm, elliptic - oblong or ovate lanceolate, acute or obtuse at base, long acuminate. Flowers in slender spikes. Fruits whitish green.

*Fl. & Fr.* : June - December.

22 km to Deban, 83506.

*Distrib.* : INDIA : Throughout India ; CHINA, JAVA, JAPAN.

*Alternanthera sessilis* (L.) R. Br. ex DC. in Cat. Hort. Monosp. 77. 1813 ; Hook. f., Fl. Brit. India 4 : 731. 1885 ; Balakr., Fl. Jowai 2 : 387. 1983. *Gomphrena sessilis* L., Sp. Pl. 225. 1753.

Small prostrate herbs. Flowers in axillary heads, white silky. Achenes pinkish white.

*Fl. & Fr.* : July - February.

M' Pen river bed, 79225.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, Tropics of the World.

*Amaranthus spinosus* L., Sp. Pl. 991. 1753 ; Hook. f., Fl. Brit. India 4 : 719. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 8. 1940.

Erect much branched herbs, with sharp axillary spines. Flowers in axillary simple or paniced spikes, in clusters, unisexual, greenish.

*Fl. & Fr.* : Throughout the year.

Miao forest, 81175 ; Happy valley, 83762.

*Distrib.* : INDIA : Throughout India, SRI LANKA, Tropics of the World.

*Celosia argentea* L., Sp. Pl. 205. 1753 ; Hook. f., Fl. Brit. India 4 : 714. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 9. 1940. *C. cristata* L., Sp. Pl. 205. 1753. *C. argentea* L. var. *cristata* (L.) A. Das. in Fl. Assam 4 : 9. 1940.

Herbs ca 1.5 m tall. Leaves 4 - 15 × 1 - 5 cm, oblong to lanceolate, acute at both ends, reddish. Flowers in spike, white to pinkish.

*Fl. & Fr.* : June - December.

Gandhigram, 82178.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, Tropical ASIA, AFRICA, AMERICA.

*Cyathula prostrata* (L.) Blume, Bijdr. 549. 1825 ; Hook. f., Fl. Brit. India 4 : 723. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 5. 1940. *Achyranthes prostrata* L., Sp. Pl. 2 : 296. 1762.

Erect herbs ; stem triangular, tinged red. Flowers in clusters in simple or paniculately branched spikes, bluish-red.

*Fl. & Fr.* : October January.

32 km away from Miao on M.V. road, 83636.

*Distrib.* : INDIA : Throughout India ; Tropics of the World.

*Deeringia amaranthoides* (Lam.) Merr., Interpr. Rumph. Herb. Anb. 211. 1917 ; Kanjilal *et al.*, Fl. Assam 4 : 3. 1940. *Achyranthes amaranthoides* Lam., Encycl. Meth. Bot. 1 : 548. 1785. *Deeringia celostodes* R. Br., Prodr. 413. 1810 ; Hook. f., Fl. Brit. India 4 : 714. 1885.

*Asm.* : *Madhu holong*.

Large straggling shrubs, with pendulous branches. Flowers in simple or paniced racemes, deep red. Fruits berry, bright red ; seeds black.

*Fl. & Fr.* : August February.

Deban forest, 79008. 88640 ; Firmbase Bulbulia, 83728 ; 26th mile, 86671.

*Distrib.* : INDIA : Uttar Pradesh, West Bengal, Sikkim, North east India ; NEPAL, BHUTAN, CHINA, MALAYSIA, AUSTRALIA.

## POLYGONACEAE

*Fagopyrum dibotrys* (D. Don) Hara, Fl. E. Himal. 69. 1966 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 701. 1987. *Polygonum dibotrys* D. Don, Prodr. Fl. Nep. 73. 1825. *Fagopyrum cymosum* (Trev.) Meissn. in Wallich, Pl. Asiat. Rar. 3 : 63. 1832 ; Hook. f., Fl. Brit. India 5 : 55. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 22. 1940.

Erect, tall herbs, stem and leaves thinly pubescent. Flowers in terminal or axillary paniced cymes, white.

*Fl. & Fr.* : August January.

Tulung Kunung, 87963.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, CHINA.

**Fagopyrum esculentum** Moench, Meth. 290. 1974 ; Hook. f., Fl. Brit India 5 : 55. 1885 ; Kanjilal *et al.*, Fl. Assam 4 : 22. 1940.

Erect herbs, ca 1 m tall, glabrous. Leaves 3 - 6 cm long, broad at base, upper leaves, usually cordate, sessile, semi amplexicaul. Flowers in terminal and axillary cymes, white or pink. Achenes ca 6 mm, sharply trigonous.

*Fl. & Fr.* : January - March.

Near Tulung - Kulung, 87963.

*Distrib.* : INDIA : Cultivated at higher elevation in North - east India and Western Ghats ; BHUTAN, CHINA, EUROPE.

*Notes.* : Cultivated in fields, achenes ground to make flour in Khasi Hills.

**Persicaria capitata** (Buch. - Ham. ex D. Don) H. Gross in Bot Jahrb. 49 : 277. 1913 ; Hara in Fl. E. Himal. 70. 1966. *Polygonum capitatum* Buch. - Ham. ex D. Don, Prodr. Fl. Nep. 73. 1825 ; Hook. f., Fl. Brit. India 5 : 44. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 18. 1940.

Perennial creeping herbs ; pubescent all over. Flowers in heads, pink or purplish. Achenes trigonous.

*Fl. & Fr.* : October - June.

Deban nala, 83737 ; Krosam, 88042 ; Deban forest, 88672 - 96386.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North - east India ; NEPAL, BHUTAN, CHINA.

**Persicaria chinensis** (L.) H. Gross in Bot. Jahrb. 49 : 269. 277 & 315. 1913 ; Hara in Fl. E. Himal. 70 & 633. 1966. *Polygonum chinense* L., Sp. Pl. 363. 1753 ; Hook. f., Fl. Brit. India 5 : 44. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 16. 1940.

Small shrubs, scrambling among bushes. Flowers in corymbosely paniculate heads, white or pinkish - white. Achenes dull - black.

*Fl. & Fr.* : October - March.

26th mile forest, 86677 ; Deban forest, 88627 ; 22 km from Deben I.B. 83520 ; Gandhigram, 99582, 99643 & 99700 ; On the way to Vijoyanagar, 99549.

*Distrib.* : INDIA : Throughout India ; MALAYA.

***Persicaria hydropiper*** (L.) Spach., Hist. Veg. 10 : 536. 1841; Hara in Fl. E. Himal. 2 : 23. 1971. *Polygonum hydropiper* L., Sp. Pl. 361. 1753 ; Hook. f., Fl. Brit. India 5 : 39. 1886 ; Burkill in Rec. Bot. Surv. India 4 : 128. 1910.

Erect or shortly creeping herbs, with swollen nodes. Flowers in filiform decurved racemes, whitish.

*Fl. & Fr.* : October March.

Deban forest, 88623 ; M'pen check gate, 83137.

*Distrib.* : INDIA : Throughout India ; CHINA, JAPAN, NORTH AMERICA, AUSTRALIA, AFRICA, EUROPE.

***Persicaria posumbu*** (Buch. Ham. ex D. Don) H. Gross in Bot. Jahrb. 49 : 313. 1913 ; Hara in Fl. E. Himal. 73. 1966. *Polygonum posumbu* Buch. Ham. ex D. Don, Prodr. Fl. Nep. 71.1825 ; Hook. f., Fl. Brit. India 5 : 38. 1886, p.p. *P. caespitosum* Blume, Bijdr. 532. 1826.

Herbs with creeping stems. Flowers in long erect racemes, white.

*Fl. & Fr.* : August February.

34th mile forest, 87639.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; INDO CHINA, CHINA, MALAYA.

***Persicaria strigosa*** (R. Br.) Nakai in Rigakkai 24 : 229. 1926. *Polygonum strigosum* R. Br., Prodr. Fl. Nov. Holl. 420. 1810 ; Hook. f., Fl. Brit. India 5 : 47. 1886.

Small herbs. Leaves beneath covered with recurved prickles. Flowers in paniced racemes, pinkish white.

*Fl. & Fr.* : August - February.

On the way to Imbeong, 86697.

*Distrib.* : INDIA : Throughout India at higher elevations ; BHUTAN, BANGLA DESH, SRI LANKA, CHINA, PHILLIPPINES.

***Persicaria tenella*** (Blume) Hara in J. Jap. B. 44 : 375. 1969. *Polygonum tenellum* Blume, Bijdr. 530. 1825 non Roxb. 1832. *P. minus non.* Huds. : Hook. f., Fl. Brit. India 5 : 36. 1886 p.p.

Erect or ascending herbs ; stem pinkish. Flowers small, in terminal racemes ; perianths glandular.

*Fl. & Fr.* : March - October.

Moti jheel, 87722.

*Distrib.* : INDIA : North - east Throughout India ; NEPAL, CHINA, JAPAN, MALAYSIA.

*Polygonum auriculatum* Meissn., Mon. Gen. Polyg. 59. t. 6. 1826 ; Van Steenis in Blumea 16 : 357. 1968. *P. chinense* var. *ovalifolium* Meissn. in Pl. Asiat. Rar. 3 : 60. 1832 ; Hook. f., Fl. Brit. India 5 : 45. 1886.

Annual herbs. Leaves oblong lanceolate or elliptic, truncate, acuminate. Flowers in corymbose paniculate heads, white. Achenes blackish.

*Fl. & Fr.* : January - September.

Tulung - Kunung, 87951.

*Distrib.* : INDIA : Arunachal Pradesh, Western Ghats ; SRI LANKA.

*Polygonum rude* Meissn. in DC., Prodr. 1 : 137. 1856 ; Hook. f., Fl. Brit. India 5 : 49. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 19. 1940.

Straggling shrubs, covered with deflexed hairs. Leaves 5 - 18 x 1.5 - 7 cm, broadly obtuse at base, acute or acuminate. Flowers ca 2 mm long, yellowish - white or white, in 10 - 25 cm long panicles.

*Fl. & Fr.* : July - January.

Glao lake, 99480.

*Distrib.* : INDIA : North - east India.

### RAFFLESIACEAE

*Sapria himalayana* Griffith, Prod. Linn. Soc. 1 : 216. 1844 ; Hook. f., Fl. Brit. India 5 : 71. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 27. 1940 ; Bedome in Bull. Bot. Surv. India 3 : 378. 1961 ; Joseph & Chauhan in Botany of some Tiger habitats in India: 26 - 29. 1983 ; Chauhan in Nayar & Sastry (ed.) Red Data Book of Indian Plants 1 : 10. 1987.

It is an obligate parasite. Its vegetative tissue consists of microscopic strands which ramify through the root cambium of host plants ; usually the host plants are lianaes or the genus *Tetrastigma* (Vitaceae) in primary evergreen forests. The flowers are ca 20 cm across, bright red and covered in sulphur - yellow spots, appear above

ground. Just before opening, flowers emitted an odour similar to that of rotting meat, which persisted for few days only. The species had never been reported common because of its specific host relationship. Presently, the species is threatened with extinction due to habitat loss.

*Fl. & Fr.* : November February.

In India, the species is currently known only from Namdapha Proposed Biosphere Reserve area.

Kumaon Bum (1800 m) 98174.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Manipur, Meghalaya ; THAILAND.

### ARISTOLOCHIACEAE

*Aristolochia platanifolia* Duchart. in DC., Prodr. 4 (1) : 347. 1830 ; Hook. f., Fl. Brit. India 5 : 76. 1886.

Large climbers. Leaves alternate, palmately 7 lobed, rounded cuneate or cordate, lobes very variable in shape and size. Inflorescence arising from the nodes, cymes axillary short, villous. Flowers large, yellowish with deep violet in ventral side ; perianth clothed with spreading hairs. Fruits 6 ridged capsule.

*Fl. & Fr.* : December September.

Firmbase, 83720 ; Wakka, 26501.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL.

### PIPERACEAE

*Peperomia heyneana* Miq., Syst. Pip. 123. 1843 ; Hook. f., Fl. Brit. India 5 : 99. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 39. 1940.

Small epiphytic herbs, quite glabrous. Flowers in axillary or terminal panicle spikes, greenish.

*Fl. & Fr.* : August March.

Deban forest, 85086 ; 27th mile, 87883 ; Kamlat to Walap, 87993.

*Distrib.* : INDIA : Kumaon to Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN.

*Peperomia tetraphylla* (Forst. f.) Hook. & Arn., B. Beech. Voy. 97. 1832. *Piper tetraphyllum* Forst. f., Prodr. 5. 1786. *P. reflexa* (L. f.) A. Dietrich, Sp. Pl. 180.1831. *non* Kunth. ; Hook. f., Fl. Brit. India 5 : 99. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 38. 1940.

Densely branched tufted herbs, often epiphytic. Flowers minute in solitary terminal spikes, which is exceeding the leaves, greenish.

*Fl. & Fr.* : September - February.

Kamlat to Walap, 87997.

*Distrib.* : INDIA : Throughout India at higher elevations ; NEPAL, SRI LANKA, CHINA, MALAYA, AFRICA, AUSTRALIA, AMERICA.

**Piper boehmeriifolia** (Miq.) DC., Prodr. 16 (1) : 348. 1869 ; Hook. f., Fl. Brit. India 5 : 85. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 35. 1940. *Chavica boehmeriaefolia* Miq., Syst. Piper 265. 1843.

Climbers with swollen nodes. Leaves 13 - 18 × 10 - 12 cm, elliptic lanceolate, ovate - oblong, acuminate, rounded or auricled at base. Inflorescence pedunculate spikes *ca* 6 cm long. Flowers sunken.

*Fl. & Fr.* : February - December.

Miao forest, 81081.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Manipur, Tripura, Meghalaya ; BHUTAN, BANGLA DESH, MYANMAR.

**Piper clarkii** C. DC. in Candollea 1 : 186. 1923 ; Kanjilal *et al.*, Fl. Assam 4 : 38. 1940.

**Chakma** : *Dautapan*.

Woody climbers. Leaves alternate, elliptic - ovate, acuminate dark green above, white below. Fruits compact on spike, yellowish.

*Fl. & Fr.* : January - December.

Deban to Hornbill, 83679 ; Kamlat to Walap, 87982 ; On way to Glao lake, 99477.

*Distrib.* : INDIA : Arunachal Pradesh.

**Piper griffithii** C. DC. in Seem. J. Bot. 163. 1886 ; Hook. f., Fl. Brit. India 5 : 81. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 33. 1940.

Climbing on branches of trees. Leaves dark green, leathery, 5 - 7 nerved. Fruiting spikes up to 20 cm long, drooping.

*Fl. & Fr.* : April - October.

Miao forest, 81082.

*Distrib.* : INDIA : North - east India.



**Piper hymenophyllum** Miq. in Hook., Lond. J. Bot. 5 : 354. 1853 ; Hook. f., Fl. Brit. India 5 : 93. 1886 ; Balakr., Fl. Jowai 2 : 397. 1983.

Slender shrubby climbers. Leaves membranous, rounded at base. Flowers in axillary white long panicles, ca 15 cm long.

*Fl. & Fr.* : October - March.

Deban forest, 83649.

*Distrib.* : INDIA : North - east & south India.

**Piper maonii** C. DC. in Candollea 1 : 196. 1923 ; Kanjilal *et al.*, Fl. Assam 4 : 38. 1940.

Climbing herbs. Leaves 1.5 - 7.5 × 0.5 - 2.5 cm, elliptic lanceolate, acuminate, base rounded or long cuneate, oblique, membranous ; basal nerves 5 ; petioles ca 3 - 4 mm long.

*Fl. & Fr.* : July - January.

Haldibari, 99434.

*Distrib.* : INDIA : Arunachal Pradesh ; MALAYA.

**Piper mullesua** D. Don, Prodr. Fl. Nep. 20. 1825. *P. brachystachyum* Hook. f., Fl. Brit. India 5 : 87. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 36. 1940.

Much branched climbers. Leaves blunt - caudate - acuminate. Flowers in spikes, olive green. Fruits a berry, green.

*Fl. & Fr.* : March - November.

27th mile on M.V. road, 86635 ; Deban, 79208 ; Hill top near Deban, 84901.

*Distrib.* : INDIA : Simla to Arunachal Pradesh, Meghalaya and South India ; BHUTAN.

**Piper nigrum** L. var. **macrostachyum** C. DC. in DC. Prodr. 16 (2) : 369. 1869 & Candollea 1 : 218. 1923 ; Deb, Fl. Tripura 2 : 138. 1983.

Climbers. Leaves elliptic - lanceolate, caudate 7 - nerved at base. Flowers in long pedunculate spikes ca 3 cm long ; smaller spikes ca 1.8 cm. long. Fruits globose, green, endocarp white.

*Fl. & Fr.* : February - December.

Salt lick forest, Miao, 83526, 83546 ; 21st. mile, M.V. road, 86664.

*Distrib.* : INDIA : Arunachal Pradesh, Tripura.

*Piper sylvaticum* Roxb., Fl. Ind. 1 : 156. 1820 ; Hook. f., Fl. Brit. India 5 : 84. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 38. 1940.

Small climbers ; stems succulent. Leaves membranous, broadly ovate cordate with long petioles ; puberulous beneath. Flowers minute, in spikes, white.

*Fl. & Fr.* : October - March.

Deban, 83596 ; 22nd mile, 83651.

*Distrib.* : INDIA : Arunachal Pradesh ; MYANMAR.

*Piper thomsonii* (C. DC.) Hook. f., Fl. Brit. India 5 : 87. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 36. 1940. *Chavia thomsonii* C. DC. in DC. Prodr. 16 (1) : 389. 1869.

Small creeping epiphytes. Leaves truncate to acute at base. Fruits in a spike, pendulous, dark green when young, red at maturity.

*Fl. & Fr.* : June - December.

Deban to Hornbill, 83675 ; Deban hill top, 85100 ; Hornbill to Firmbase, 83682 ; Krosam to Shirong, 88055 ; P. Kund, 99473.

*Distrib.* : INDIA : Sikkim, North east India.

### SAURURACEAE

*Houttuynia cordata* Thunb., Vet. Acad. Stockh. Handl. 4 : 149. 151, t. 5. 1783 ; Hook. f., Fl. Brit. India 5 : 78. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 31. 1940.

Foetid glabrous perennial herbs. Leaves reniform cordate at base. Flowers in terminal spikes, bright white. Fruits sub globose capsule.

*Fl. & Fr.* : June - December.

Pangsu Pass Forest, 81223.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Assam, Meghalaya ; THAILAND, CHINA, JAPAN.

### CHLORANTHACEAE

*Chloranthus elatior* R. Br. in Bot. Mag. t. 2190. 1820 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 709. 1987. *C. officinalis* Blume,

Enum. Pl. Jav. 79. 1827 ; Hook. f., Fl. Brit. India 5 : 100. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 40. 1940.

Tall erect herbs or under shrubs, stems dark green. Leaves with bulbous base. Flowers in spikes, pendulous, white. Fruits also white.

*Fl. & Fr.* : June - December.

M' Pen forest, 81024 ; Salt lick forest, Miao, 83562 ; Deban forest, 83541.

*Distrib.* : INDIA : North - east India ; NEPAL, CHINA, MALAYA.

**Chloranthus glaber** (Thunb.) Makino in Bot. Tokyo 26 : 386. 1912. *Bladhia glabra* Thunb. in Trans. Linn. Soc. 2 : 331. 1791. *Chloranthus brachystachya* Blume, Pl. Jav. Fasc. 8 : 13. t. 2. 1829 ; Hook. f., Fl. Brit. India 5 : 100. 1886 ; Kanjilal *et al.*, Fl. Assam 1 : 10. 1910. *Sarcandra glabra* (Thunb.) Nakai, Fl. Sylv. Koreana 18 : 17. 1930.

Under Shrubs, up to 2 m high, glabrous. Leaves 6 - 13 x 3 - 6 cm, elliptic - lanceolate or elliptic - oblanceolate, cuneate at base, acuminate. Flowers white, in panicles. Fruits 6 mm, globose, bright - red.

*Fl. & Fr.* : August - January.

Gandhigram, 99609.

*Distrib.* : INDIA : North - east & Southern India ; INDO MALAYA.

### MYRISTICACEAE

**Knema cinerea** (Poiret) Warb. var. **andamanica** (Warb.) Sinclair in Gard. Bull. Singapore 18 : 174. 1961. *K. glauca* Blume var. *andamanica* Warb. Monog. Myrist. 596. 1897. *K. angustifolia* (Roxb.) Warb., Monog. Myrist, 68 : 561. 1897 ; Balakr., Fl. Jowai 2 : 400. 1983. *Myristica angustifolia* Roxb., Fl. Ind. 3 : 847. 1832 ; Kanjilal *et al.*, Fl. Assam 4 : 45. 1940. *M. longifolia* Wallich ex Hook. f. var. *erratica* Hook. f., Fl. Brit. India 5 : 110. 1886.

Asm. : *Mota pasuti*.

Small or large trees, with a dense ovoid crown ; bark dark grey. Flowers fascicled in axils of fallen leaves, pink or reddish - pink. Fruits dark brown.

*Fl. & Fr.* : December - August.

Miao salt lick forest, 81056 ; Deban, 85098.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

### LAIURACEAE

*Actinodaphne obovata* (Nees) Blume, Mus. Bot. 1 : 342, 1851 ; Hook. f., Fl. Brit. India 5 : 153, 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 76, 1940. *Tetradenis obovata* Nees in Wallich, Pl. Asiat. Rar. 2 : 64, 1831.

*Asm.* : Puni hunda.

Large handsome trees ; bark grey or nearly white. Flowers in fascicles on extra axillary racemes, yellowish. Fruits ellipsoid.

*Fl. & Fr.* : March August.

10th mile forest, 87761 ; Gandhigram, 99446.

*Distrib.* : INDIA : Sikkim, North east India, BANGLA DESH.

*Beilschmiedia roxburghiana* Nees in Wallich, Pl. Asiat. Rar. 2 : 69, 1831 ; Hook. f., Fl. Brit. India 5 : 121, 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 51, 1940. *Laurus bilocularis* Roxb., Fl. Ind. 2 : 317, 1832.

Evergreen, small trees ; young parts brown silky tomentose. Leaves crowded at the ends of branchlets, 6-20 × 2-7 cm, elliptic to ovate, cuneate at base, short acuminate. Flowers in axillary panicles, yellowish green. Fruits baccate, dark purple.

*Fl. & Fr.* : March February.

40th mile near Burma nala, 79145.

*Distrib.* : INDIA : North east India ; MYANMAR.

*Cinnamomum bejolghota* (Buch. Ham.) Sweet., Hort. Brit. ed. 1 : 344, 1827 ; Balakr., Fl. Jowai 2 : 407, 1983. *Laurus bejolghota* Buch. Ham. in Trans. Linn. Soc. 13 : 559, 1822. *Cinnamomum obtusifolium* (Roxb.) Nees in Wallich, Pl. Asiat. Rar. 2 : 73, 1831 ; Hook. f., Fl. Brit. India 5 : 128, 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 56, 1940.

*Asm.* : Pati - hunda.

Tall trees with dense ovoid crown ; bark grey or blackish brown. Flowers in terminal or axillary panicles, yellowish - green. Fruits ellipsoid.

*Fl. & Fr.* : January July.

Miao forest, 79052 ; Salt lick forest, 81049.

*Distrib.* : INDIA : North - east India, Andaman Islands ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Cinnamomum glanduliferum** (Wallich) Meissn. in DC., Prodr. 15 (1) : 25. 1864 ; Hook. f., Fl. Brit. India 5 : 135. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 59. 1940. *Laurus glandulifera* Wallich in Trans. Soc. Med. Phys. Calc. 1 : 45. t. 1. 1825.

*Asm.* : *Gonsroi*.

Large trees ; bark dark grey or blackish. Flowers in long panicles, greenish yellow. Young fruits ellipsoid, greenish.

*Fl. & Fr.* : April August.

Deban forest, 85052.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, CHINA, MALAYA.

**Cinnamomum pauciflorum** Nees in Wallich, Pl. Asiat. Rar 2 : 75. 1831 ; Hook. f., Fl. Brit. India 5 : 129. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 57. 1940.

Small trees. Leaves elliptic - obovate to oblong - lanceolate, rounded at base, acute or shortly acuminate. Flowers in laxly branched panicles. Fruits globose.

*Fl. & Fr.* : April October.

Long seck, 25724.

*Distrib.* : INDIA : Arunachal Pradesh, Assam, Meghalaya ; BANGLA DESH.

**Cinnamomum tamala** (Buch. Ham.) Nees & Eberm., Handb. Med. Pharm. B. 2 : 426. 1831 ; Hook. f., Fl. Brit. India 5 : 128. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 56. 1940. *Laurus tamala* Buch. Ham. in Trans. Linn. Soc. 13. 555. 1822.

*Asm.* : *Tejpat*.

Middle sized trees ; buds and young leaves silky pubescent. Flowers in long panicles, grey outside and yellow inside.

*Fl. & Fr.* : February September.

Happy valley, 85765.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN.

*Litsea cubeba* (Lour.) Pers., Syn. Pl. 2 (1) : 4. 1806 ; Balakr., Fl. Jowai 2 : 403. 1983. *Laurus cubeba* Lour., Fl. Cochinch. 252. 1700. *Litsea citrata* Blume, Bijdr. 565. 1825 ; Hook. f., Fl. Brit. India 5 : 155. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 81. 1940.

Small trees with drooping branches ; bark greenish brown. Flowers solitary or in umbells or in short corymbs, yellow or pale yellow.

*Fl. & Fr.* : October June.

On the way to Deban, 79155 ; Gandhigram, 99658 & 99635.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, INDO CHINA, INDONESIA, MALAYA.

*Litsea lancifolia* (Roxb. ex Nees) Hook. f., Fl. Brit. India 5 : 159. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 84. 1940. *Tetranthera lancifolia* Roxb. ex Nees in Wallich, Pl. Asiat. Rar. 2 : 65. 1831.

Tall spreading shrubs ; bark dark grey. Flowers in axillary sessile fascicles, yellowish.

*Fl. & Fr.* : April November.

Deban forest, 79189.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, CHINA, MALAYA.

*Litsea monopetala* (Roxb.) Pers., Syn. Pl. 2 (1) : 4. 1806 ; Balakr., Fl. Jowai 2 : 404. 1983. *Tetranthera monopetala* Roxb., Fl. Corom. 2 : 26, 148. 1800. *Litsea polyantha* Juss., Ann. Mus. 6 : 211. 1805 ; Hook. f., Fl. Brit. India 5 : 162. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 83. 1940.

*Asm.* : Hoanlu.

Middle sized trees, bark dark grey. Flowers fascicled in short racemes, yellowish green. Fruits black.

*Fl. & Fr.* : April December.

Miao forest, 81137.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, BANGLA DESH, MYANMAR, CHINA, MALAYA.

*Litsea salicifolia* (Roxb. ex Nees) Hook. f., Fl. Brit. India 5 : 167. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 87. 1940. *Tetranthera salicifolia* Nees in Wallich, Pl. Asiat. Rar. 2 : 6. 1831.

*Var. salicifolia*Asm. : *Digloti*.

Small trees or shrubs, branches silky or brown tomentose. Flowers in umbels, in fascicles or in short racemes, yellowish. Fruits purplish black or violet.

*Fl. & Fr.* : February June.

Nampong forest, 81204 ; Deban forest, 83586 ; 27th mile forest, 87879 ; Jairampur Nampong road side, 88261 ; Wakro to Glao lake, 99503.

*Distrib.* : INDIA : Throughout North east India ; NEPAL, MYANMAR, BANGLA DESH, CHINA.

*Neocinnamomum caudatum* (Nees) Merr. in Centr. Am. Arb. 8 : 64. 1934. *Cinnamomum caudatum* Nees in Wallich, Pl. Asiat. Rar. 2 : 76. 1831 ; Hook. f., Fl. Brit. India 5 : 134. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 57. 1940.

Medium sized trees, bark dark brown or grey. Flowers minute, in short few flowered terminal or axillary cymes. Fruits bright scarlet.

*Fl. & Fr.* : July March.

South bank of Noa Dihing river at 20th mile, 85028.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, MYANMAR, CHINA.

*Neolitsea fuliosa* (Nees) Gamble, Fl. Pres. Madras 1240. 1925 ; Kanjilal *et al.*, Fl. Assam 4 : 93. 1940. *Litsea foliosa* Nees, Syst. Lour. 622. 1836. *Litsea zeylanica sensu* Hook. f., Fl. Brit. India 5 : 178. 1886, *p.p.*

Medium sized trees ; bud scales and bracts silky ; bark dark brown. Flowers in heads, in shortly peduncled fascicles ; greenish at bud stage.

*Fl. & Fr.* : March December.

Krosam, 88031.

*Distrib.* : INDIA : North east and South India ; BHUTAN, BANGLA DESH, SRI LANKA, MALAYA.

*Persen bombycina* (King ex Hook. f.) Kosterm. in Reinwardtia 6 : 191. 1962. *Maehilus bombycina* King ex Hook. f., Fl. Brit. India 5 : 516. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 66. 1940.

Small trees up to 6 m high. Leaves 5-12 x 2-4 cm, oblong-elliptic, oblanceolate-elliptic, cuneate at base, acuminate. Flowers ca 5 mm across, greenish-yellow, in terminal panicles. Fruits ca 7 mm across, globose.

*Fl. & Fr.* : December-June.

Tihun village forests, 99495.

*Distrib.* : INDIA : North-east India ; NEPAL, BHUTAN.

***Phoebe lanceolata*** (Nees) Noes, Syst. Laur. 109. 1836 ; Hook. f., Fl. Brit. India 5 : 141. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 71. 1940. *Ocotea lanceolata* Nees in Wallich, Pl. Asiat. Rar. 2 : 71. 1831.

Small or middle sized trees ; bark whitish. Flowers in long panicles, greenish-white or yellow. Fruits blackish-purple.

*Fl. & Fr.* : May-November.

27th mile forest, 87896 ; 40th mile forest, 87931.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North-east India & at higher elevations in South India ; MYANMAR.

#### THYMELAEACEAE

***Aquilaria khasiana*** Hall. in Med. Herb. Leid. 44 : 18. 1922 ; Kanjilal *et al.*, Fl. Assam 4 : 113. 1940. *A. agallocha* non Roxb. : Hook. f., Fl. Brit. India 5 : 199. 1886, *p.p.*

Small trees ; bark pale brown. Flowers in subsessile terminal or extra-axillary pubescent fascicles. Fruits long capsules, glabrous.

*Fl. & Fr.* : May-October.

Deban forest, 85078.

*Distrib.* : INDIA : North-east India.

***Aquilaria malaccensis*** Lam., Encycl. Meth. Bot. 1 : 49. 1783 ; Hook. f., Fl. Brit. India 5 : 200. 1886. *Aquilaria agallocha* Roxb., Fl. Ind. 2 : 422. 1832 ; Hook. f., Fl. Brit. India 5 : 199. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 112. 1940.

Asm. : *Sasi*.

Small trees ; bark white or greyish-white. Flowers in terminal umbellate cymes, yellowish-white. Fruits capsule.

*Fl. & Fr.* : June-August.



Salt lick forest, Miao, 81163 ; 39th mile forest, 87672.

*Distrib.* : INDIA : North east India ; MYANMAR.

**Edgeworthia gardneri** (Wallich) Meissn. in Dentschr. B. Ges. Regensb. 3 : 280. t. 6. 1841 ; Hook. f., Fl. Brit. India 5 : 1195. 1886, *p.p.* ; Kanjilal *et al.*, Fl. Assam 4 : 110. 1940. *Daphne gardneri* Wallich in Asiat. Research. 13. 388, t. 9. 1820.

Tall shrubs or small trees. Leaves elliptic lanceolate, elliptic oblong, acute or acuminate. Flowers in dense spherical heads, yellow, fragrant ; ovary villous.

*Fl. & Fr.* : January - October.

Tulung - Kunung, 87973.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Manipur ; NEPAL, BHUTAN, CHINA, JAPAN.

#### ELAEAGNACEAE.

**Elaeagnus infundibularis** Momiyama in J. Jap. Bot. 48 : 262. f. 3. 1973. *E. armata* Buch. Ham. ex D. Don, Prodr. Fl. Nep. 67. 1825, *Pro Syn. E. conferta auct. non Roxb.* ; D. Don, Prodr. Fl. Nep. 67. 1825 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 752. 1987. *E. latifolia non L.* 1753 : Hook. f., Fl. Brit. india 5 : 202. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 114. 1940.

Straggling shrubs ; branches silvery ; bark blackish grey. Flowers axillary in fascicles, yellowish. Fruits pinkish or yellowish.

*Fl. & Fr.* : September - April.

Noa - Dihing river bank, 84905.

*Distrib.* : INDIA : North east india ; NEPAL, BHUTAN.

**Elaeagnus parvifolia** Wallich ex Royle, Illus. Bot. Him. 323, t. 81, f. 1. 1836. *E. umbellata non Thunb.* : D. Don, Prodr. Fl. Nep. 68. 1825 ; Hook. f., Fl. Brit. India 5 : 201. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 114. 1940.

Much branched thorny shrubs ; young shoots covered with silvery scales. Flowers in small axillary clusters, dull white. Fruits pulp bright orange, edible.

*Fl. & Fr.* : June - March.

South bank of Noa - Dihing at 28th mile 85015.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, JAPAN, CHINA, AFGHANISTAN.

*Elaeagnus pyriformis* Hook. f., Fr. Brit. India 5 : 202. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 115. 1940.

Scandent shrubs with spreading branches. Leaves 2.9 x 1.3 cm, elliptic, obovate-elliptic, ca 6 mm long, clustered. Fruits ca 1 cm long, clustered.

77 to 85 km, M. V. road, 99602.

*Distrib.* : INDIA : North east India.

### LORANTHACEAE

*Helixanthera ligustrina* (Wallich) Dans., Verh. Kon. Ned. Akad. Wet. A, Dam sect, 2, 29 (6) : 57. 1933 ; Kanjilal *et al.*, Fl. Assam 4 : 120. 1940. *Loranthus ligustrinus* Wallich in Roxb., Fl. Ind. 2 : 219. 1824 ; Hook. f., Fl. Brit. India 5 : 207. 1886.

Stem parasitic, evergreen shrubs ; young parts rusty tomentose. Flowers in axillary racemes, solitary or paired, purplish or scarlet. Fruits ellipsoid, red.

*Fl. & Fr.* : May - December.

Pangsau Pass forest, 81235 ; 22nd mile M.V. road, 87867.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA.

*Helixanthera parasitica* Lour., Fl. Cochinch. 142. 1790 ; Kanjilal *et al.*, Fl. Assam 4 : 120. 1940. *Loranthus pentapetalus* Roxb., Fl. Ind. 1 : 553. 1820 ; Hook. f., Fl. Brit. India 5 : 206. 1886.

Shrubs with spreading branches. Leaves 3.8 x 1.3 cm, ovate-lanceolate or lanceolate, cuneate at base, acuminate. Flowers ca 7 mm long, obovoid, crimson-red.

*Fl. & Fr.* : March - September.

Deban to 40th mile forest, 98053 ;

P. Kund, 96353.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, MALAYA.

*Macrosolen cochinchinensis* (Lour.) Van Tiegh. in Bull. Soc. Bot. France 41 : 122. 1894 ; Kanjilal *et al.*, Fl. Assam 4 : 127. 1940. *Loranthus cochinchinensis* Lour., Fl. Cochinch. 1 : 195. 1790. L.

*ampullaceus* Roxb., Fl. Ind. 2 : 189. 1824 ; Hook. f., Fl. Brit. India 5 : 220. 1886. *L. globosus* Roxb., Fl. Ind. 1 : 550. 1820 ; Hook. f., Fl. Brit. India 5 : 220. 1886.

Asm. : *Raghumala*.

Stout shrubs, branches drooping. Flowers in axillary racemes, solitary or clustered, 5-10 flowered, greenish or greenish yellow. Fruits pale yellow at maturity.

Fl. & Fr. : December-June.

Miao forest, 81076.

Distrib. : INDIA : Uttar Pradesh, Sikkim, North-east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA.

***Scurrula pulverulenta*** (Wallich) G. Don, Gen. Syst. 3 : 421. 1834 ; Kanjilal *et al.*, Fl. Assam 4 : 125. 1940. *Loranthus pulverulentus* Wallich in Roxb., Fl. Ind. 2 : 221. 1824 ; Hook. f., Fl. Brit. India 5 : 211. 1886.

Stout shrubs. Leaves 4-13 x 1-6 cm, broad ovate, acute or rounded at base, acute or obtuse. Flowers ca 2 cm long, in axillary racemes or fasciculate. Fruits scurfy white-tomentose.

Fl. & Fr. : October-February.

Deban to 40th mile forest, 98058.

Distrib. : INDIA : Uttar Pradesh, Sikkim, North-east India ; NEPAL, BHUTAN, MYANMAR.

***Taxillus umbellifer*** (Schult.) Dans. in Bull. Jard. Bot. Buitenz. ser. 3, 11 : 445. 1931. *Loranthus umbellifer* Schult., Syst. 7 (1) : 97. 1829 ; Hook. f., Fl. Brit. India 5 : 211. 1886. *Scurrula umbellifer* (Schult.) G. Don, Gen. Hist. 3 : 421. 1834 ; Kanjilal *et al.*, Fl. Assam 4 : 126. 1940.

Bushy parasites, young parts rusty brown. Leaves 4-8 x 1-5 cm, oblong, cuneate at base, obtuse or subacute. Flowers 1-3 cm long, dark red, slightly curved. Fruits ca 8 mm long, turbinate.

Fl. & Fr. : June-December.

Gandhigram, 99661.

Distrib. : INDIA : Uttar Pradesh, Sikkim, North-east India ; NEPAL, BHUTAN.

***Taxillus vestitus*** (Wallich) Dans. in Bull. Jard. Bot. Buitenz. Ser. 3, 10 : 349. 1929 ; Kanjilal *et al.*, Fl. Assam 4 : 122. 1940. *Loranthus*

*vestitus* Wallich in Roxb., Fl. Ind. 2 : 218. 1924 ; Hook. f., Fl. Brit. India 5 : 212. 1886.

Large parasitic shrubs ; branches brown, young parts tomentose. Flowers in sessile or pedunculate axillary fascicles, greenish white. Fruits dull yellow.

*Fl. & Fr.* : September February.

Lati river near Kunung, 87966.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL.

### SANTALACEAE

*Osyris quadripartita* Salz. ex Deene., Ann. Sci. Nat. Ser. 2, 6 : 65. 1836. *O. wightiana* Wallich ex Wight Icon. Pl. Ind. Orient. 5 : t. 1853, 1852 ; Santapan in Rec. Bot. Surv. India 16 : 269, 1953. *O. arborea* Wallich ex DC., Prodr. 14 : 633. 1857 ; Hook. f., Fl. Brit. India 5 : 232. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 130. 1940.

Large twiggy glabrous shrubs or small trees, with angled branches. Flowers minute, polygamous, in axillary peduncled fascicled. Fruits red when ripe.

*Fl. & Fr.* : March February.

Lati river near Tulung Kunung, 87952.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east & South India ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, CHINA.

### BALANOPHORACEAE

*Balanophora dinica* Royle, Illus. Bot. Himal. 330. 1836 & t. 99. 2. 1839 ; Hook. f., Fl. Brit. India 5 : 237. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 132. 1940.

Herbs, parasitic on roots ; rootstock tuberous lobed or branched. Rhizomes branched. Inflorescence flashy club - shaped, reddish. Perianth segments light yellow or white.

*Fl. & Fr.* : November February.

26th mile 86685 ; On the way to Kumaon Bum from Gandhigram, 78767.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL, MYANMAR.

**Rhopalocnemis phalloides** Jungh in Nov. Acad. Nat. Cur. 18 (1) : 233. 1814 ; Hook. f., Fl. Brit. India 5 : 239. 1886 ; Kanjilal *et al.*, Fl. Assam 4 : 133. 1949 ; Joseph & Chauhan in Botany of Some Tiger Habitats in India. Bot. Surv. India Howrah, 26-29. 1983 ; Chauhan in Nayar & Sastry (ed.) Red Data Book of Indian Plants 2 : 71. 1988.

A very stout, dioecious and glabrous root parasites of perennial nature, sheaths at the base of peduncles, *ca* 1-2.4 cm in diameter. Peduncles *ca* 2-10 cm long, cylindric, pale brown ; the female inflorescence is very large, fleshy *ca* 25 cm tall and 10-15 cm in circumference, ovoid to oblong, brown to rusty brown, style reflexed. Male flowers with the staminal column *ca* 1-1.6 cm long, filaments velvety.

*Fl. & Fr.* : December-March.

Near 40th mile on M.V. road.

*Distrib.* : INDIA : Arunachal Pradesh, Sikkim ; NEPAL, INDONESIA.

#### DAPHNIPHYLLACEAE

**Daphniphyllum himalense** (Benth.) Muell. Arg. in DC., Prodr. 16 (1) : 4. 1869 ; Hook. f., Fl. Brit. India 5 : 534. 1887 ; Balakr., Fl. Jowai 2 : 417. 1983. *Goughia himalayensis* Benth. in Hook., Kew J. Bot. 6 : 9. 1854.

Medium sized trees *ca* 10-12 m tall. Leaves crowded near apices of branches, 10-20 × 2-5 cm, oblanceolate, acute or cuneate at base, acute to acuminate. Flowers in long racemes, dioecious ; stamens 5, anthers basifixed. Fruits ellipsoid drupe.

*Fl. & Fr.* : April-December.

27th mile, M.V. road, 83593.

*Distrib.* : INDIA : Uttar Pradesh to North-east India ; MYANMAR.

#### EUPHORBIACEAE

**Actephila excelsa** (Dalz.) Muell. - Arg. in Linnaea 32 : 78. 1863 ; Hook. f., Fl. Brit. India 5 : 282. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 148. 1940. *Anomospermum excelsum* Dalz. in Hook., Kew J. Bot. 3 : 228. 1851.

Shrubs or small trees ; bark grey. Flowers minute, in axillary or extra-axillary clusters or short racemes, greenish. Fruits depressed capsule.

*Fl. & Fr.* : April - December.

Nampong forest, 81201 ; 22 nd km away from Deban I.B., 83514 ; Deban forest, 85053.

*Distrib.* : INDIA : North - east & South India, Andaman ; SRI LANKA, MALAYA, INDONESIA.

*Antidesma acuminatum* Wallich ex Wight, Icon. t. 1991. 1853 ; Hook. f., Fl. Brit. India 5 : 363. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 168. 1940.

*Asm. Pani heloch.*

Shrubs or small trees ; bark pale brown. Flowers in long paniced racemes, minute, greenish - white. Fruits elliptic, pinkish.

*Fl. & Fr.* : March - November.

M' Pen check gate, 83155 ; Salt lick forest, Miao, 83553 ; 40th mile, 87921 ; 21 st kms point on Miao - Deban road, 81103.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, BANGLA DESH, MALAYSIA.

*Antidesma huius* (L.) Sprengel, Syst. Veg. 1 : 826. 1825 ; Hook. f., Fl. Brit. India 5 : 358. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 166. 1940. *Silago bunius* L., Mant. 1 : 122. 1767.

*Asm.* : *Pani heloch.*

Small trees, bark blackish - brown or dark brown. Flowers in long racemes or panicles, minute, greenish - reddish. Fruits ellipsoid, red turning to black.

*Fl. & Fr.* : April - October.

Deban forest, 85081.

*Distrib.* : INDIA : Throughout India ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, CHINA, MALAYSIA, AUSTRALIA.

*Antidesma nigricans* Tul. in Ann. Soc. Nat. Ser. 3, 15 : 225. 1851 ; Hook. f., Fl. Brit. India 5 : 360. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 167. 1940.

Shrubs or small trees ; bark pale brown. Flowers in long paniced spikes, greenish purple. Fruits obovoid, red.

*Fl. & Fr.* : April - October.

M' Pen forest, 81015.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

*Antidesma roxburghii* Wallich ex Tul. in Ann. Sc. Nat. Ser. 3, 15 : 234. 1851 ; Hook. f., Fl. Brit. India 5 : 357. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 166. 1940.

*Asm.* : *Khokora*.

Tall shrubs ; young parts densely villous. Flowers in long spikes, dense, greenish. Fruits ovoid, red.

*Fl & Fr.* : April - October.

Salt lick forest, Miao, 81048.

*Distrib.* : INDIA : North east India ; BANGLA DESH.

*Aporosa octandra* (Buch. Ham. ex D. Don) Vickery in Enum. Fl. Pl. Nepal 3 : 193. 1982. *Myrica octandra* Buch. Ham. ex D. Don, Prodr. Fl. 56. 1825. *Aporosa dioica* (Roxb.) Muell. Arg. in DC., Prodr. 15 (2) : 472. 1866 ; Balakr., Fl. Jowai 2 : 422. 1983. *Alnus dioica* Roxb., Fl. Ind. 3 : 580. 1832. *Aporosa roxburghii* Bail., Etudes Gen. Euphorb. 645. 1859 ; Hook. f., Fl. Brit. India 5 : 347. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 162. 1940.

Tall shrubs or small trees ; bark blackish or dark grey. Flowers in spikes, often fascicled, greenish. Fruits capsule, yellow.

*Fl. & Fr.* : December - June.

Salt lick forest, Miao, 81165.

*Distrib.* : INDIA : North east India ; MYANMAR, BANGLA DESH.

*Arachne cordifolia* (Decne.) Hurusawa in J. Fac. Sci. Univ. Tokyo, B. 6 : 339. 1954. *Leptopus cordifolius* Decne. in Jacquem., Voy. Ind. 4 : 155. 1844. *Andrachne cordifolia* (Decne.) Muell. Arg. in DC, Prodr. 15 (2) : 234. 1866 ; Hook. f., Fl. Brit. India 5 : 283. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 149. 1940.

Small shrubs, with young parts hairy. Flowers monoecious on long filiform pedicels. Fruits globose, slightly bi or tri lobed.

*Fl. & Fr.* : June - October.

South bank of Noa Dihing river, 85139.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, TIBET, MYANMAR, CHINA, AFGHANISTAN.

**Baccaurea ramiflora** Lour., Fl. Cochinch. 661, 1790. *Pieraria sapida* Roxb., Fl. Ind. 2 : 254. 1832 ; Hook. f., Fl. Brit. India 5 : 371. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 161. 1940.

Asm. : *Leteki*.

Middle sized trees ; bark grey, warty. Flowers in long racemes, yellow. Fruits globose, yellow.

*Fl. & Fr.* : April August.

10th mile camp, 87759 ; 27th mile forest, 87892.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA.

**Baliospermum calycinum** Muell. Arg. in Fl. 47 : 479. 1864 ; Hook. f., Fl. Brit. India 5 : 462. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 203. 1940.

Shrubs or small trees ; bark pale grey or whitish. Flowers in long panicles or in sub corymbosely branched panicles, white.

*Fl. & Fr.* : August December.

Deban forest, 84993 ; On the way to Haldibari, 99419.

*Distrib.* : INDIA : North east India ; NEPAL.

**Baliospermum micranthum** Muell. Arg. in Linnæa 34 : 215. 1865 ; Hook. f., Fl. Brit. India 5 : 462. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 202. 1940.

Tall shrubs or small trees ; bark greenish - brown. Flowers in long panicles with lateral branches, greenish white. Fruits orang-coloured.

*Fl. & Fr.* : June December.

Deban forest, 85074.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Bridelia pubescens** Kurz in J. Asiat. Soc. Beng. 42 (2) : 241. 1873 ; Hook. f., Fl. Brit. India 5 : 270. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 145. 1940.

Medium sized trees ; bark grey. Flowers in short spikes or in axillary clusters, greenish yellow. Fruits red at maturity.

*Fl. & Fr.* : April January.



Tulung Kunung forest, 87967 ; P. Kund, 96355 ; Gandhigram, 99686.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR.

*Claoxylon longipetiolatum* Kurz, For. Fl. Brit. Burma 2 : 396. 1877 ; Hook. f., Fl. Brit. India 5 : 413. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 211. 1940.

Small trees, with fistular stem. Leaves clustered at the tip, margins wavy. Flowers in buds, in hispid racemes, greenish white.

*Fl. & Fr.* : June - October.

Miao forest, 81098.

*Distrib.* : INDIA : Arunachal Pradesh, Andamans ; MYANMAR.

*Cleidion spiciflorum* (Burm. f.) Merr., Inter. Herb. Amb. 322. 1917. *Acalypha spiciflora* Burm. f., Fl. Ind. 203. f. 61. 1768. *Cleidion javanicum* Blume Bijdr. 613. 1825 ; Hook. f., Fl. Brit. India 5 : 444. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 220. 1940.

*Asm.* : *Loti sorot.*

Middle sized trees ; bark grey or greyish white. Flowers in long axillary racemes, drooping, white.

*Fl. & Fr.* : January - June.

Firmbase 83708 ; Ganga jheel, 87729.

*Distrib.* : INDIA : North east India ; Western Ghats & Andamans ; NEPAL, CHINA, MALAYSIA.

*Croton caudatus* Geisel., Croton Monogr. 73. 1807 ; Hook. f., Fl. Brit. India 5 : 388. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 194. 1940.

*Asm.* : *Lata mahudi.*

Large scandent shrubs ; bark brown. Flowers in long terminal racemes, in dense fascicled rachis, yellowish or pinkish yellow. Fruits trigonous capsule, tomentose.

*Fl. & Fr.* : April - October.

Miao forest, 81133 & 81053 ; Nampong forest, 81216 ; 22 km to Deban I.B., 83528 ; Happy valley forest, 83784 ; Namchick - Manmao forest, 88243 ; 17th km Deban road, 96367.

*Distrib.* : INDIA : North east and South India ; NEPAL, SRI LANKA, CHINA, MALAYSIA.

**Croton joufra** Roxb., Fl. Ind. 3 : 685. 1832 ; Hook f., Fl. Brit. India 5 : 387. 1887 ; Kanjital *et al.*, Fl. Assam 4 : 193. 1940.

Asm. : *Mahudi*.

Tall shrubs or small trees, bark white or greyish white. Flowers in terminal or axillary racemes, yellow. Fruits a capsule.

*Fl. & Fr.* : December - June.

Salt lick forest, Miao, 81050 ; P. Kund, 99448 ; Deban valley, 99410.

*Distrib.* : INDIA : North east India ; MYANMAR.

**Croton roxburghii** Balakr., in Bull. Bot. Surv. India 3 : 39. 1961 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 784. 1987. *C. oblongifolius* Roxb., Fl. Ind. 3 : 685. 1832, *non* Delile ; Hook. f., Fl. Brit. India 5 : 386. 1887 ; Kanjital *et al.*, Fl. Assam 4 : 192. 1940.

Asm. : *Mahunda*.

Medium sized trees ; bark white or greyish. Flowers in long racemes, yellow. Fruits ellipsoid, capsule.

*Fl. & Fr.* : February - June.

Happy valley, 93773 ; 10th mile forest, 87779, 87792 ; Krosun to Shinong, 88054.

*Distrib.* : INDIA : Throughout India ; BANGLA DESH, SRI LANKA.

**Drypetes assamica** (Hook. f.) Pax & Hoffm. in Pflanzenr. Heft. 81 : 241. 1922 ; Kanjital *et al.*, Fl. Assam 4 : 179. 1940. *Cyclostemon assamicus* Hook. f., Fl. Brit. India 5 : 342. 1887.

Asm. : *Dukoha*.

Small trees, 5 - 10 m tall. Leaves 7 - 15 × 3.2 - 6 cm, elliptic - oblong or elliptic - lanceolate, oblique at base, acute or shortly acuminate, entire. Flowers in fascicles, axillary. Fruits globose, rusty tomentose, pulp bright red with hard seed.

*Fl. & Fr.* : August - December.

Deban forest, 83584 ; M' Pen check gate, 83158 ; 22 km to Deban I.B., 83532.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Tripura, Meghalaya, Andaman islands.

**Euphorbia hirta** L., Sp. Pl. 454. 1753 ; Kanjilal *et al.*, Fl. Assam 4 : 141. 1940. *E. pitulifera sensu* Hook. f., Fl. Brit. India 5 : 250. 1887. *non* L. 1753.

Erect or decumbent herbs, with simple or dichotomously branched stem. Flowers monoecious sub - sessile or pedunculate, heads, resembling single flowers, greenish pink.

*Fl. & Fr.* : January - December.

Deban forest, 84936.

*Distrib.* : INDIA : North - east India ; Pantropical weed.

**Homonoia riparia** Lour., Fl. Cochinch. 637. 1790 ; Hook. f., Fl. Brit. India 5 : 455. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 220. 1940.

Shrubs, profusely branched from the base ; bark dark grey or brown. Flowers in axillary spikes dioecious, bracteate greenish in buds. Fruits globose, brown.

*Fl. & Fr.* : March - November.

Namchick - Manmao road, 88239.

*Distrib.* : INDIA : Throughout India ; MALAYA.

**Macaranga denticulata** Muell. - Arg. in DC., Prodr. 15 (2) : 1000. 1866 ; Hook. f., Fl. Brit. India 5 : 446. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 218. 1940.

*Asm.* : *Moralia*.

Small trees ; bark greyish. Flowers in axillary panicles ; male flowers in clusters ; female flowers solitary, yellowish or greenish - yellow. Fruits black.

*Fl. & Fr.* : March - August.

Hornbil to Firmbase, 83686 ; Happy valley, 83785 ; Burma nala, 79201 & 98076.

*Distrib.* : INDIA : North - east India, Andamans : NEPAL, MYANMAR, THAILAND, CHINA, MALAYSIA.

**Mallotus roxburghianus** Muell. - Arg. in Linnæa 34 : 188. 1865 ; Hook. f., Fl. Brit. India 5 : 428. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 214. 1940.

*Asm.* : *Buri tokon*.

Shrubs ; bark dark grey or greyish brown. Leaves brownish tomentose beneath, greenish above. Flowers in terminal or axillary spikes, small, yellow. Fruits capsule.

*Fl. & Fr.* : April - December.

Miao forest, 81099 ; Nampong forest, 81217.

*Distrib.* : INDIA : Sikkim, North - east India ; BANGLA DESH, MYANMAR.

**Mallotus tetracoccus** (Roxb.) Kurz, J. Asiat. Soc. Beng. 16 : 245. 1873. *Rottlera tetracocca* Roxb., Fl. Ind. 3 : 827. 1832. *Mallotus albus* non (Roxb.) Muell. Arg. in Linnaca 34 : 188. 1865 ; Hook. f., Fl. Brit. India 5 : 429. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 213. 1940.

*Asm.* : *Larubanda*.

Middle sized trees ; bark greyish brown. Flowers dioecious, in terminal or axillary panicles ; male flowers in clusters ; female solitary. Fruits capsule with soft spines.

*Fl. & Fr.* : February - August.

M' Pen check gate, 81001 ; Gandhigram 99677.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR.

**Ostodes paniculata** Blume, Bijdr. 620. 1826 ; Hook. f., Fl. Brit. India 5 : 400. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 197. 1940.

*Asm.* : *Tarichange*.

Middle or large trees ; bark grey or dark brown. Flowers in long panicles, purplish white. Fruits sub globose capsule.

*Fl. & Fr.* : February - August.

Deban forest, 85085 ; East of Noa Dihing river, 87772.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

**Phyllanthus debilis** Klein ex Willd., Sp. Pl. 4 : 582. 1804 ; Joseph, Fl. Nongpoh 236. 1981. *P. debilis* Ham. ex Hook. f., Fl. Brit. India 5 : 299. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 158. 1940.

Tall herbs or undershrubs. Leaves short petioled, 1 - 1.6 × 0.5 - 1.3 cm, ovate to oblong, membranous. Flowers axillary, in clusters, greenish white. Fruits tricarpeillary, drooping.

*Fl. & Fr.* : July - October.

Salt lick forest, 83560.

*Distrib.* : INDIA : Throughout India ; BHUTAN, AFRICA.

**Phyllanthus reticulatus** Poiret, Encycl. Meth. Bot. 5 : 298. 1809 ; Hook. f., Fl. Brit. India 5 : 288. 1887 ; Balakr., Fl. Jowai 2 : 425. 1983. *Kirgamelia reticulata* (Poiret) Baill., Etud. Euphorb. 613. 1858 ; Kanjilal *et al.*, Fl. Assam 4 : 159. 1940.

Shrubs up to 2 m tall. Leaves 12 - 20 x 8 - 15 cm, elliptic or oblong-ovate, cuneate at base, subacute or rounded at apex. Flowers axillary solitary or in fascicles. Young fruits globose, reddish.

*Fl. & Fr.* : December - May.

Gandhigram, 99629 & 99641.

*Distrib.* : INDIA : Throughout India ; AFRICA, SRI LANKA, CHINA, MALAYSIA.

**Phyllanthus urinaria** L., Sp. Pl. 982. 1753 ; Hook. f., Fl. Brit. India 5 : 293. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 155. 1940.

Erect or procumbent herbs with angled branchlets. Flowers very small, axillary on distal nodes of branchlets. Fruits tuberculate, greenish-red.

*Fl. & Fr.* : February - December.

M' Pen check gate, 83146 ; Deban forest, 83664.

*Distrib.* : INDIA : Throughout India ; Pantropical weed.

**Ricinus communis** L., Sp. Pl. 1007. 1753 ; Hook. f., Fl. Brit. India 5 : 457. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 211. 1940.

*Asm.* : *Eragach*.

Evergreen soft-wooded shrubs ; stem-pith hollow. Flowers monoecious, in terminal sub-panicled racemes, yellow. Fruits globose capsule, short spinous.

*Fl. & Fr.* : Throughout the year.

Happy valley, 83771.

*Distrib.* : INDIA : Throughout India ; Native of Tropical AFRICA.

*Sapium buccatum* Roxb., Fl. Ind. 3 : 694. 1832 ; Hook. f., Fl. Brit. India 5 : 470. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 206. 1940.

Asm. : *Seleng.*

Giant trees, with straight boles ; bark blackish dark grey. Flowers in terminal paniculate racemes, yellowish or greenish yellow. Fruits globose, purplish black.

*Fl. & Fr.* : March October.

Deban forest, 81059 ; Namchick Manmao road, 88241 ; Namgoi, 88256.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA.

*Sauropus androgynus* (L.) Merr. in Bull. Bur. For. Philipp. Is. 1 : 30. 1903. *Claytia androgyna* L., Mant. Pl. 128. 1767. *Sauropus albicans* Blume, Bijdr. 596. 1825 ; Hook. f., Fl. Brit. India 5 : 332. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 172. 1940.

Tall herbs or small shrubs with angular branchlets. Flowers minute, axillary, greenish yellow or yellowish. Fruits globose, whitish.

*Fl. & Fr.* : August January.

Near zero camp, 84911 ; 27th mile forest, 84955 ; 20th mile forest, 86676.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL, SRI LANKA, CHINA, MALAYSIA.

*Sauropus stipulatus* Hook. f., Fl. Brit. India 5 : 333. 1887.

Small shrubs, with terete branches. Flowers minute, axillary, greenish yellow. Fruits globose, stipitate.

*Fl. & Fr.* : April October.

27th mile forest, 87888.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh.

*Securinegia virosa* (Roxb. ex Willd.) Baill. in Adansonia 6 : 334. 1886 ; Balakr., Fl. Jowai 2 : 425. 1983. *Phyllanthus virosus* Roxb. ex Willd., Sp. Pl. 4 : 578. 1805. *Flueggia microcarpa* Blume, Bijdr. 580. 1825 ; Hook. f., Fl. Brit. India 5 : 328. 1887. *F. virosa* (Willd.) Baill., Etudes Gen. Euphorb. 593. t., 39 - 43. 1850 ; Kanjilal *et al.*, Fl. Assam 4 : 160. 1940.

Tall shrubs or small trees ; bark brown or reddish - brown. Flowers axillary, solitary or in fascicles, greenish - yellow.

*Fl. & Fr.* : June - October.

Miao forest, 81144 ; Jairampur - Nampong road, 81196.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, JAPAN, MALAYSIA, AFRICA, AUSTRALIA.

*Tragia involucrata* L., Sp. Fl. 980. 1753 ; Hook. f., Fl. Brit. India 5 : 465. 1888.

Twining herbs with stinging hairs. Leaves 12 x 5 cm, broadly ovate, abruptly acuminate, hirsute. Perianth lobes of female flowers hairy.

*Fl. & Fr.* : March - September.

Deben to 39th mile, 98827.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, SRI LANKA, CHINA.

#### BISCHOFIACEAE

*Bischofia javanica* Blume, Bijdr. 1168. 1827 ; Hook. f., Fl. Brit. India 5 : 345. 1887 ; Kanjilal *et al.*, Fl. Assam 4 : 141. 1940.

Medium sized trees ; bark pale brown. Flowers in paniced racemes, greenish. Fruits globose, pinkish - brown ; 4 - 6 seeded.

*Fl. & Fr.* : May - February.

Kamlat to Krosam, 88012.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India, Western Ghats ; MALAYA.

#### ULMACEAE

*Celtis tetrandra* Roxb., Fl. Ind. 2 : 63. 1824 ; Hook. f., Fl. Brit. India 5 : 482. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 277. 1940.

Asm. : Mirihukuta.

Large trees ; young parts pubescent ; bark dark grey. Flowers monoecious ; male flowers on long pedicels ; female flowers sub - sessile. Fruits drupe, orange red.

*Fl. & Fr.* : February - October.

Nampong forest, 81209.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

*Trema orientalis* (L.) Blume, Mus. Bot. 2 : 62. 1849 ; Hook. f., Fl. Brit. India 5 : 484. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 230. 1940. *Celtis orientalis* L., Sp. Pl. 1044. 1753.

Trees with drooping branches ; bark greenish. Flowers in axillary, dense or lax - flowered cymes, white. Fruits ovoid, black.

*Fl. & Fr.* : March - October.

Left bank of Deban nala. 85110 ; 40 km M.V. road, 96370.

*Distrib.* : INDIA : North - east and South India ; MALAYA.

### CANNABACEAE

*Cannabis sativa* L. subsp. *indica* (Lam.) Wehmer in die Pflanzenfam 248. 1911 ; Small & Cronquist in Taxon 25 : 428. 1976 ; Deb, Fl. Tripura 1 : 207. 1981. *C. indica* Lam., Encycl. Meth. Bot. 1. 695. 1785.

*Asm.* : Jungli bhang, Bhang.

Shrubs slender ca 1.5-2 m tall. Leaves 3 - 11 foliolate ; leaflets 6 - 14 × 0.2 - 1.2 cm, sessile, narrowly lanceolate, coarsely serrate, long acuminate, dark green, aromatic. Flowers in spikes, small, greenish.

*Fl. & Fr.* : June - December.

Miao town, 81177.

*Distrib.* : INDIA : Foot hills of Himalaya, Arunachal Pradesh, Assam, Manipur, Meghalaya ; MYANMAR, MALAYA, AFRICA, AMERICA.

### MORACEAE

*Artocarpus chama* Buch. - Ham. in Mem. Wern. Soc. 5 : 331. 1826. *A. chaplasha* Roxb., Fl. Ind. 3 : 525. 1832 ; King in Fl. Brit. India 5 : 543. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 267. 1940.

*Asm.* : Sam.

Lofty trees ; bark brown with white patches. Receptacle axillary, globose ; peduncles long, puberulous. Fruits peduncled, tubercled.



*Fl. & Fr.* : April - August.

Miao forest, 81149.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR.

**Artocarpus heterophyllus** Lam., *Encycl. Meth. Bot.* 3 : 210. 1789 ; Santapau in *Bull. Bot. Surv. India* 3 : 12. 1962 ; Haridasan & Rao, *For. Fl. Meghalaya* 2 : 814. 1987. *A. intergrifolius non L. f.* : King in *Fl. Brit. India* 5 : 541. 1888. *A. integra sensu A. Das* in *Fl. Assam* 4 : 268. 1940.

*Asm.* : *Kathal*.

Large trees ; bark dark grey, blackish - brown. Receptacle greenish. Flowers in heads. Fruits long, tubercled.

*Fl. & Fr.* : February - October.

M' Pen forest, 87778.

*Distrib.* : INDIA : Cultivated widely throughout India ; MALAYSIA.

**Cudrania cochinchinensis** (Lour.) Kudo & Masam. in *Ann. Rep. Taihoku Bot. Gard.* 2 : 27. 1932 ; Balakr., *Fl. Jowai* 2 : 444. 1983. *Vantera cochinchinensis* Lour., *Fl. Cochinch.* 564. 1790. *Cudrania javanensis* Trec in *Ann. Sci. Nat. Ser.* 3,8 : 123. 1847 ; King in *Fl. Brit. India* 5 : 538. 1888 ; Kanjilal *et al.*, *Fl. Assam* 4 : 270. 1940.

*Asm.* : *Puli Kaint*.

Large woody shrubs ; bark brown. Flowers in heads, greenish yellow. Fruits globose, orange - red when ripe.

*Fl. & Fr.* : February - October.

Kamlat to Krosam, 88017.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; MYANMAR, BANGLA DESH, SRI LANKA, MALAYA, AFRICA, AUSTRALIA.

**Ficus altissima** Blume, *Bijdr.* 444. 1825 ; King in *Fl. Brit. India* 5 : 504. 1888 ; Kanjilal *et al.*, *Fl. Assam* 4 : 240. 1940.

*Asm.* : *Gadubar*.

Lofty spreading trees ; bark greyish. Receptacles globose, sessile, yellow when ripe.

*Fl. & Fr.* : October - June.

Deban forest, 86602.

*Distrib.* : INDIA : North east & South India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

**Ficus auriculata** Lour., Fl. Cochinch. 666. 1790. *F. roxburghii* Wallich ex Miq. in Ann. Mus. Bot. Lugd. - Bat. 3 : 296. 1867 ; King in Fl. Brit. India 5 : 534. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 262. 1940.

Tall trees ; bark greyish, warty. Receptacles in fascicles on short thick leafless branchlets, purplish orange when ripe.

*Fl. & Fr.* : April - October.

M' Pen check gate, 83165 ; 16th mile forest, 85176 ; Namchick - Manmao road, 88248 ; Teng village, 99496.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; PAKISTAN, MYANMAR, CHINA.

**Ficus drupacea** Thunb. var. **pubescens** (Roth.) Corner in Gard. Bull. Straits Settlements. 17 : 381. 1960 ; Deb, Fl. Tripura 1 : 213. 1981. *F. mysorensis* Hyne ex Roth., Nor. Sp. 390. 1821 ; King in Fl. Brit. India 5 : 500. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 240. 1940.

*Asm.* : *Dhopobar*.

Trees large, evergreen, sometimes epiphytic, young parts tomentose. Leaves 12 - 25 × 6 - 12 cm, broadly elliptic or ovate elliptic, entire, acuminate, glabrous. Receptacles ca 3 cm globose, rusty tomentose when young, glabrous, orange at ripe. Female flowers with 4 perianth lobes, style lateral. Achenes ovoid.

*Fl. & Fr.* : October - May.

12th mile forest area, 83789.

*Distrib.* ; INDIA ; North east India, Western Ghats ; MYANMAR, BANGLA DESH, SRI LANKA, LAOS.

**Ficus elastica** Roxb. ex Hornem., H. Hafn. Suppl. 7. 1819 ; King in Fl. Brit. India 5 : 508. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 242. 1940.

*Asm.* : *Athabor*.

Large trees, much spreading. Receptacles enclosed in hooded involucre, greenish yellow when ripe.

*Fl. & Fr.* : May - October.

Deban forest, 85102.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, MALAYA.

**Ficus fistulosa** Reinw. in Blume, Bijdr. 470. 1825 ; King in Fl. Brit. India 5 : 525. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 255. 1940. *F. millingtonifolia* Griffith, Notul. 4 : 396. 1854.

Asm. : kathia dimaru.

Tall shrubs or small trees. Leaves 6-20 × 3-7 cm, alternate or opposite, obovate-oblong or oblanceolate, acuminate, entire, coriaceous. Receptacles axillary or in branches on trunks, red. Female flower's perianth tubular, style lateral.

*Fl. & Fr.* : February - September.

Deban forest, 84938 ; 30 km point M.V. road, 96375.

*Distrib.* : INDIA : North east India, Andaman & Nicobar Island ; MYANMAR, CHINA, THAILAND, MALAYSIA.

**Ficus heteropleura** Blume, Bijdr. 466. 1825 ; Corner in Gard. Bull. Singapore 21 : 77. 1965 ; Deb, Fl. Tripura 1 : 214. 1981. *F. urophylla* Wallich ex King in Fl. Brit. India 5 : 498. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 239. 1940.

Small trees. Leaves 4-8 × 2-8 cm, elliptic or ovate, undulate, abruptly caudate, attenuated at base, glabrous, coriaceous. Receptacles pedunculate, sub-globose, axillary, orange or reddish-yellow when ripe.

*Fl. & Fr.* : February - September.

Salt lick forest, 85001.

*Distrib.* : INDIA : North-east India ; BHUTAN, BANGLA DESH, MYANMAR, THAILAND, MALAYSIA.

**Ficus hirta** Vahl, Enum. 2 : 201. 1805 ; King in Fl. Brit. India 5 : 531. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 255. 1940.

Medium sized trees ; bark dark grey or brown, warty. Receptacles ovoid-globose ; densely brown villous, usually in pairs.

*Fl. & Fr.* : October - June.

Namchick Manmao road, 88248 ; Nampong forest, 81198 ; 34th mile forest, 87649.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

**Ficus ischnopoda** Miq. in Ann. Mus. Lugd. - Bat. 3 : 229. 1867 ; Balakr., Fl. Jowai 2 : 440. 1983. *F. pyriformis* Hook. f. & Arn. var. *ischnopoda* (Miq.) King in Ann. Bot. Gard. Calc. 1 : 158. 1888 & in Fl. Brit. India 5 : 533. 1888 ; Kanjilal *et al.* Fl. Assam 4 : 256. 1940.

Tall shrubs or small trees ; bark white, smooth. Receptacles pyriform, constricted above and base, peduncled, solitary, red when ripe.

*Fl. & Fr.* : August - May.

32 km from Miao to Deban, 83641 ; East of Deban, 85073 ; South bank of Noa Dihing river near Deban, 85141.

*Distrib.* : INDIA : North east India ; CHINA.

**Ficus laevis** Blume, Bijdr. 437. 1825 ; King in Fl. Brit India 5 : 526. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 260. 1940.

Woody shrubs, epiphytic ; bark grey ; branches usually drooping. Receptacles pyriform, globose, greenish - yellow when ripe.

*Fl. & Fr.* : June - December.

29th mile forest, 86607.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, SRI LANKA, CHINA, MALAYA.

**Ficus maclelandi** King var. *rhododendrifolia* (Miq.) Corner in Gard. Bull. Singapore 18 : 100. 1961. *F. rhododendrifolia* Miq., Ann. Mus. Lugd. - Bat. 3 : 286. 1867 ; King in Fl. Brit. India 5 : 510. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 244. 1940.

Tall trees ; bark grey or whitish. Receptacles axillary, sessile in pairs, ovoid, yellow red at maturity.

*Fl. & Fr.* : August February.

Burma nala, 87625, 87658.

*Distrib.* : INDIA : North east India ; MALAYA.

**Ficus nervosa** Heyne ex Roth., Nov. Pl. Sp. 338. 1817 ; King in Fl. Brit. India 5 : 512. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 245. 1940. *F. angustifolia* Roxb., Fl. Ind. 3 : 554. 1832.

*Asm.* : Kharipati dimru.

Large trees, buttressed at base. Leaves 5 - 20 × 5 - 7 cm, ovate to lanceolate or elliptic, glossy above, thinly coriaceous. Receptacles axillary, in pairs, globose, ca 1 cm diam., brownish at ripe.

*Fl. & Fr.* : October - June.

Salt lick forest, Miao, 81041.

*Distrib.* : INDIA : Sikkim, North east India, Western Ghats ; BHUTAN, MYANMAR, SRI LANKA, CHINA, MALAYA.

*Ficus oligodon* Miq., Ann. Mus. Bot. Lugd. Bat. 3 : 234, 297, 1867 ; Balakr., Fl. Jowai 2 : 439, 1983. *F. pomifera* Wallich ex King in Fl. Brit. India 5 : 535, 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 263, 1940.

Asm. : *Takik - asing*.

Tall trees ; bark smooth, greyish. Receptacles pyriform on leafless branches, peduncled, reddish when mature.

*Fl. & Fr.* : August - January.

Hill top near Deban, 85099 ; 40th mile forest, 87678.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA, MALAYA.

*Ficus rigida* Jack., Mal. Misc. 2 (7) : 72, 1822 ; Merr. in J. Arn. Arb. 33 : 225, 1952. *F. glaberrima* Blume, Bijdr. 451, 1825 ; King in Fl. Brit. India 5 : 506, 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 241, 1940.

Asm. : *Pani - asing*.

Large trees, buttressed ; bark grey or dark grey, warty. Receptacles pyriform, orange red when ripe.

*Fl. & Fr.* : June - December.

19th mile forest, 85158 ; 27th mile forest, 87894.

*Distrib.* : INDIA : North east India, Andamans ; NEPAL, MYANMAR, CHINA, MALAYSIA.

*Ficus sarmentosa* Buch. Ham. ex J.E. Smith in Rees, Cyclop. 14 : 45, 1810 ; Balakr., Fl. Jowai 2 : 437, 1983. *F. foveolata* Wallich ex Miq., Ann. Mus. Bot. Lugd. - Bat. 3 : 294, 1867 ; King in Fl. Brit. India 5 : 528, 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 261, 1940.

Straggling woody shrubs ; young parts pubescent. Receptacles axillary, solitary, globose, ovoid, purplish when ripe.

*Fl. & Fr.* : February - October.

40th mile forest, 79183.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA, MALAYA, JAPAN.

*Ficus semicordata* Buch. Ham. ex J.E. Smith in Rees, Cyclop. 14 : 71. 1810. *F. cunia* Roxb., Fl. Ind. 3 : 561. 1832 ; King in Fl. Brit. India 5 : 523. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 253. 1940.

Medium sized trees ; bark dark grey. Receptacles in pairs or in clusters, globose or pyriform, red at maturity.

*Fl. & Fr.* : February - December.

27th mile forest area, 87880.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, MYANMAR, CHINA, MALAYA.

*Ficus sinuata* Thunb., Diss. *Ficus* 6 : 12. 1786. *F. rostrata* Lam., Encycl. Meth. Bot. 2 : 498. 1788 ; King in Fl. Brit. India 5 : 528. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 251. 1940.

*Asm.* : *Khuntia*.

Scandent or creeping shrubs ; bark smooth, greyish brown. Receptacles axillary, solitary, in pairs or in clusters, globose, brick - red with white specked when ripe.

*Fl. & Fr.* : December - June.

Jairampur on way to Nampong, 81192.

*Distrib.* : INDIA : North east India ; BHUTAN, MYANMAR, BANGLA DESH, MALAYA.

*Ficus squamosa* Roxb., Fl. Ind. 3 : 531. 1832. *F. saemocarpa* Miq., Ann. Mus. Bot. Lugd. - Bat 3 : 232. 296. 1867 ; King in Fl. Brit. India 5 : 523. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 252. 1940.

Tall shrubs ; bark dark grey. Receptacles solitary, pedunculate, pyriform, globose, rusty brown when ripe.

*Fl. & Fr.* : August - April.

Noa - Dibing river bed, 85076.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

*Ficus subincisa* Buch. Ham. ex J.E. Smith in Rees, Cyclop. 14 : 91. 1810. *F. clavata* Wallich ex Miq. in Lond. J. Bot. 7 : 431. 1848 ; King in Fl. Brit. India 5 : 520. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 248. 1940.

Erect shrubs or small trees ; bark greyish brown. Receptacles axillary, solitary, globose or ovoid, greenish yellow or yellow when ripe.

*Fl. & Fr.* : August - June.

Nampong forest, 81211 ; Noa Dihing river, 84939 ; 27th mile forest, 84976.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

**Ficus subulata** Blume, Bijdr. 460. 1825 ; King in Fl. Brit. India 5 : 497. 1888 *F. sikkimensis* Miq., Ann. Mus. Bot. Lugd. - Bat. 3 : 225. 1867 ; Kanjilal *et al.*, Fl. Assam 4 : 249. 1940.

*Asm.* : Daljhuri.

Small trees ; bark grey or greyish brown. Receptacles almost sessile, solitary or fascicled, globose, pinkish - yellow when ripe.

*Fl. & Fr.* : March - October.

27th mile forest, 87865.

*Distrib.* : INDIA : North east India ; NEPAL, CHINA, MALAYSIA.

### URTICACEAE

**Boehmeria glomerulifera** Miq. in Zoll. Syst. Verz. Ind. Archip. 101. 104. 1854. *B. malabarica* Wedd., Arch. Mus. Hist. Nat. 8 : 350. 1856 ; Hook. f., Fl. Brit. India 5 : 575. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 286. 1940.

Tall shrubs or small trees ; bark greyish. Flowers in axillary, sessile, in clusters, greenish - white. Achenes orange.

*Fl. & Fr.* : September - March.

Miao forest, 81097 ; M' Pen check gate, 83133, 83715 ; Deban forest, 79009.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, BANGLA DESH, SRI LANKA, MALAYSIA.

**Boehmeria hamiltoniana** Wedd. in Ann. Sci. Nat. Ser. 4, 1 : 199. 1854 ; Hook. f., Fl. Brit. India 5 : 579. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 289. 1940.

Small shrubs ; bark reddish brown. Flowers in clusters, minute, in slender spikes, often drooping, greenish. Achenes reddish brown.

*Fl. & Fr.* : July - January.

Deban forest, 83513, 83609.

*Distrib.* : INDIA : North east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Boehmeria macrophylla** Horne., Hort. Reg. Bot. Hafn. 2 : 890. 1815. *non* D. Don ; Friis & Marais in Kew Bull. 37 : 163. 1982. *B. platyphylla* D. Don, Prodr. Fl. Nep. 60. 1825 ; Hook. f., Fl. Brit India 5 : 578. 1888, *p.p.*; Kanjilal *et al.*, Fl. Assam 4 : 288. 1940.

Shrubs with spreading branches ; bark blackish. Flowers small, whitish in long spikes. Achenes brownish.

*Fl. & Fr.* : June - January.

21 km to Deban, 81106 ; M' Pen forest, 83186 ; 40th mile M.V. road, 99587 ; Deban forest, 99404 ; Thumba to Panikham, 99515.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, SRI LANKA, CHINA, MALAYA.

**Boehmeria penduliflora** (Wedd.) Long in Notes R. Bot. Gard. Edinburgh 40 : 130. 1982. *B. penduliflora* Wedd., Ann. Sci. Nat. Ser. 4, 1 : 199. 1854. *nom nud.* *B. macrophylla* D. Don, Prodr. Fl. Nep. 60. 1825. *non* Hornem. ; Hook. f., Fl. Brit. India 5 : 577. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 288. 1940.

Shrubs ; bark dark brown. Flowers monoecious, in dense clusters, drooping spikes, brown or greenish - yellow. Achenes yellowish.

*Fl. & Fr.* : August - January.

Deban river bank, 85117 ; 22 km to Deban I.B., 79016, 83529.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, MYANMAR, CHINA.

**Debregeasia longifolia** (Burm. f.) Wedd. in DC., Prodr. 16 : 235. 1869 ; Kanjilal *et al.*, Fl. Assam 4 : 295. 1940. *Urtica longifolia* Blume, Bijdr. 924. 1826. *Debregeasia velutina* Gaud., Bot. Bonite Voy. t. 90. 1843 ; Hook. f., Fl. Brit. India 5 : 590. 1888.

Asm. : *Dalah - sing.*

Tall shrubs or small trees ; bark dark brown ; young parts silky tomentose. Flowers in lateral dichotomous panicles. Achenes orange yellow.



*Fl. & Fr.* : June - December.

40th mile, 79127 ; Deban forest, 83606, 85119 ; South bank of Noa - Dihing river near Deban, 85140 ; Tulung Kunung, 87950 ; Gandhigram, 99680.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, CHINA, SRI LANKA, MYANMAR, MALAYSIA.

**Elatostema platyphyllum** Wedd., Monogr. Urtic. 301. 1856 ; Hook. f., Fl. Brit. India 5 : 566. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 285. 1940.

var. **platyphyllum**.

Erect shrubs, branches often zigzag. Flowers clustered in the heads ; female flowers pubescent. Achenes ovoid, dotted with red.

*Fl. & Fr.* : November - February.

Deban river side, 83581.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, CHINA.

**Elatostema sessile** Forst., Char. Gen. 106. 1776 ; Hook. f., Fl. Brit. India 5 : 563. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 284. 1940.

Herbs small *ca* 75 cm tall, often epiphytic or lithophytic. Leaves 6 - 13 × 2 - 4 cm, elliptic - lanceolate, obliquely acute at base, acuminate ; male receptacles brownish - red ; female brownish - green. Achenes ellipsoid, ribbed.

*Fl. & Fr.* : February - August.

Deban forest, 79028.

*Distrib.* : INDIA : Throughout India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYA, AFRICA.

**Girardinia diversifolia** (Link) Friis in Kew Bull. 36 : 145. 1981 ; *Urtica diversifolia* Link, Enum. H. Berol. 2 : 385. 1822. *Girardinia heterophylla* Decne. in Jacquem., Voy. 4 (Bot) : 151. t. 153. 1835. *excl. basionym* ; Hook. f., Fl. Brit. India 5 : 550. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 282. 1940.

Stout under shrubs, armed with numerous slender stings. Flowers in terminal or axillary spikes, yellowish - white or white. Achenes compressed.

*Fl. & Fr.* : September - December.

M' Pen check gate, 83166.

*Distrib.* : INDIA : Punjab, Uttar Pradesh, Sikkim, North - east & South India ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, CHINA, & MALAYA.

*Laportea terminalis* Wight, Icon. Pl. Orient. 6 : 9, t. 1972. 1853 ; Hook. f., Fl. Brit. India 5 : 849. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 282. 1940.

Tall herbs with many stinging hairs. Flowers in axillary cymes ; female flowers in sub - terminal panicles ; pedicels spatulate, broadly winged. Achenes deflexed.

*Fl. & Fr.* : October - February.

Firmbase to Bulbulia, 83732.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east & South India ; NEPAL, BHUTAN, MYANMAR, SRI LANKA, CHINA, MALAYSIA.

*Oreocnide integrifolia* (Gaud.) Miq., Ann. Mus. Bot. Lugd. - Bat. 4 : 306. 1869 ; Kanjilal *et al.*, Fl. Assam 4 : 293. 1940. *Villebrunea integrifolia* Gaud., Bot. Bontie Voy. t. 91. 1844 ; Hook. f., Fl. Brit. India 5 : 589. 1888.

*Asm.* : *Chho oi paroli*.

Small trees ; bark brown or blackish - grey. Flowers in dichotomously branched heads, white or yellowish - white. Achenes white when ripe.

*Fl. & Fr.* : October - July.

19th to 22nd km, M.V. road, 79086 ; M'Pen check gate, 83142 ; Near zero camp, 85186 ; 27th mile, 87872 ; Gandhigram, 99600.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

*Pilea glaberrima* (Blume) Blume, Mus. Bot. Lugd. - Bat. 2 (4) : 54. 1856 ; Balakr., Fl. Jowai 2 : 447. 1983. *Urtica glaberrima* Blume, Bijdr. 493. 1826. *Pilea smilacifolia* Wedd. in Ann. Sci. Nat. Ser. 4, 1 : 186. 1854 ; Hook. f., Fl. Brit. India 5 : 553. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 282. 1940.

Tall erect herbs or under shrubs with angled stem. Flowers in axillary, dichotomously branched cymes, minute, creamy - white to reddish. Achenes ovoid, compressed.

*Fl. & Fr.* : February - July.

40th mile forest area, 79129 ; 17th mile forest, 83759.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL, MYANMAR, JAVA.

***Pilea scripta*** (Buch. - Ham. ex D. Don) Wedd. in Ann. Sci. Nat. Ser. 4, 1 : 187. 1854 ; Hook. f., Fl. Brit. India 5 : 556. 1888. *Urtica scripta* Buch. - Ham. ex D. Don, Prodr. Fl. Nep. 59. 1825.

Tall much branched herbs, stem ribbed. Flowers minute, in axillary cymes, light - green. Achenes small with ridges.

*Fl. & Fr.* : October - March.

On the way to Imbeong, 87612 ; Shirong - Hunung, 88204.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, MYANMAR, CHINA.

***Poikilospermum naucleiflorum*** (Roxb. apud Lindley) Chew in Gard. Bull. Singapore 20 : 76. 1963. *Conocephalum naucleiflorus* Roxb. apud. Lindley in B. Reg. 14 : 5. 1203 A & B. 1828. *C. suaveolens auct. non* Blume ; Hook. f., Fl. Brit. India 5 : 545. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 272. 1940.

Asm. : *Lata dimoru*.

Large woody climbing shrubs ; bark greyish or yellowish - brown. Flowers fragrant, in axillary cymes ; female heads pinkish - purple.

*Fl. & Fr.* : February - June.

North of 10th mile towards M'Pen, 87745, 87788 ; Shirong to Hunung, 88097 ; 40 km M.V. road, 96377.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, THAILAND.

***Pouzolzia bennettiana*** Wight, Icon. 6. t. 1978. 1853 ; Hook. f., Fl. Brit. India 5 : 585. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 291. 1940.

Tall herbs, young parts pubescent. Flowers minute, in axillary clusters, white or greenish - white.

*Fl. & Fr.* : September - March.

M' Pen check gate, 83134.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya, South India ; SRI LANKA.

**Pouzolzia sanguinea** (Blume) Merr. in J. Str. Branch Asiat. Soc. Spec. no. 84 : 233. 1921 ; Haridasan & Rao, For. Fl. Meghalaya 2 : 846. 1987. *Urtica sanguinea* Blume, Bijdr. 500. 1826. *Pouzolzia viminea* (Wedd.) Wedd. in DC., Prodr. 16 (1) : 228. 1869 ; Hook. f., Fl. Brit. India 5 : 581. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 290. 1940.

var. **sanguinea**.

Asm. : *Misagi - jolla - phang*.

Erect herbs or under shrubs ; bark brownish. Flowers in axillary clusters, greenish - white. Achenes ovoid.

*Fl. & Fr.* : August - March.

Miao forest, 81122 ; M' Pen chack gate, 81026 ; 20 kms towards M' Pen 79160, 83193.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, MALAYSIA.

**Pouzolzia sanguinea** (Blume) Merr. var. **fulgens** (Wedd.) Hara in Fl. E. Himalaya 3 : 27. 1975. *P. fulgens* Wedd., Monogr. Urtic. 411. 1857. *P. viminea* (Wedd.) Wedd. var. *fulgens* Wedd. in DC., Prodr. 16 (1) : 228. 1869 ; Hook. f., Fl. Brit. India 5 : 581. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 291. 1940.

Tall herbs or under shrubs ; bark dark brown ; branchlets pubescent. Leaves white glummy beneath. Flowers in axillary clusters, greenish white or yellow.

*Fl. & Fr.* : September - February.

M' Pen Forest, 83189.

*Distrib.* : INDIA : Arunachal Pradesh ; NEPAL, BHUTAN, MYANMAR.

**Procris crenata** C.B. Robinson in Philip. J. Sci. Bot. 5 : 507. 1911. *P. laevigata auct. non* Blume ; Hook. f., Fl. Brit. India 5 : 575. 1888 ; Balakr., Fl. Jowai 2 : 448. 1983. *Elatostema wightiana* Wedd. in Ann. Sci. Nat. Ser. 4, 1 : 188. 1854.

Epiphytic under shrubs or herbs, 20 - 120 cm tall. Leaves 8 - 16 × 2 - 3 cm, oblanceolate, obliquely cuneate at base, acuminate. Male flowers in small cymes in the axils of fallen leaves ; female flowers capitate with fleshy receptacles. Achenes, ovoid, compressed, white.

*Fl. & Fr.* : July - February.

40th mile to Burma nala, 792120 ; M.V. road 99533.

*Distrib.* : INDIA : Sikkim, North east India, Western Ghats ;  
BHUTAN, SRI LANKA, MALAYA, AFRICA.

### JUGLANDACEAE

**Engelhardia spicata** Leschen. ex Blume, Bijdr. 528. 1826 ; Hook. f., Fl. Brit. India 5 : 595. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 299, 1940.

Asm. : *Lal amiri*.

Medium sized trees ; bark grey or greyish brown. Male flowers in slender spikes ; female flowers in long pendulous spikes, greenish. Fruits winged, pale brown when ripe.

*Fl. & Fr.* : November - June.

40th mile forest, 87934 ; Nampong forest, 88750.

*Distrib.* : North east India ; NEPAL, BHUTAN, CHINA, MALAYSIA.

### BETULACEAE

**Alnus nepalensis** D. Don. Prodr. Fl. Nep. 58. 1825 ; Hook. f., Fl. Brit. India 5 : 600. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 327. 1940.

Nep. : *Utis*.

Middle sized trees ; bark grey, greyish brown. Male flowers in catkins, slender, drooping paniced ; female flowers in short spiked. Fruiting spikes, oblong, blackish brown when ripe.

*Fl. & Fr.* : September - April.

32 km from Miao, 83660 ; Burma nala, 87656 ; Deban forest, 89167.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA.

**Betula alnoides** Buch. Ham. ex D. Don. Prodr. Fl. Nep. 58. 1825 ; Hook. f., Fl. Brit. India 5 : 599. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 328. 1940.

Medium sized or large trees ; bark pale brown, peeling off in horizontal rolls. Male spike slender, greenish - yellow ; female fascicled. Fruiting spikes ca 2.5 cm long.

*Fl. & Fr.* : April - September.

Kumion Bum, 78776.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, CHINA.

### FAGACEAE

*Castanopsis armata* Spach., Hist. Veg. Phan. 11 : 185. 1842 ; Hook. f., Fl. Brit. India 5 : 622. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 323. 1940.

Medium sized trees. Leaves 10 - 20 x 3 - 5 cm, oblong - lanceolate, cuneate or acute at base, caudate - acuminate. Flowers in simple panicles. Fruits ca 3 cm across, globose, spiny on ridges.

*Fl. & Fr.* : May - January.

Gandhigram, 99683.

*Distrib.* : INDIA : North - east India ; MYANMAR.

*Castanopsis echinocarpa* Miq. in Ann. Mus. B. Lugd. Bat. 1 : 119. 1863. *C. echidnocarpa* A. DC. in DC., Prodr. 16 (2) : 112. 1864. *C. tribuloides* var. *echidnocarpa* (A. DC.) Hook. f., Fl. Brit. India 5 : 623. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 325. 1940.

Tall trees ; bark dark grey. Male flowers minute, in spikes, paniculate or fascicled ; female flowers in solitary spikes, greenish. Fruits spiny, with solitary nut.

*Fl. & Fr.* : September - April.

40th mile to Burma nala, 79143.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

*Castanopsis indica* (Roxb.) A. DC. in Seem. J. Bot. 1 : 182. 1863 ; Hook. f., Fl. Brit. India 5 : 620. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 321. 1940.

Asm. : *Hinguri*.

Lofty trees, with much spreading branches ; bark greyish. Male flowers in laxly branched spikes ; female flowers in solitary spikes, brown tomentose. Fruits capsule densely covered with spines.

*Fl. & Fr.* : February (Following year).

40th mile to Burma nala, 79139 ; Salt lick forest, Miau, 83800.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

**Castanopsis lancifolia** (Roxb.) Hockel & A. Camus in Bull. S.B. Fr. 68 : 394. 1921. *Quercus lancaefolia* Roxb., Fl. Ind. ed. 2, 3 : 634. 1832. *non* Schlecht. & Cham. ; Hook. f., Fl. Brit. India 5 : 616. 1888. *Castanea lancifolia* Kurz, For. Fl. Brit. Burma 2 : 482. 1877. *Castanopsis roxburghiana* S.N. Riswas in Bull. Bot. Surv. India 11 : 189. 1969. *nom. illegit.*

Small trees ; bark grey - brownish. Leaves silvery rusty beneath. Flowers in long spikes. Fruits bursting irregularly. Nut thin, puberulous.

*Fl. & Fr.* : April - October.

Near 27th mile, 84985 & 98057.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

**Castanopsis tribuloides** (Smith) A. DC. in Seem. J. Bot. 1 : 182. 1863 ; Hook. f., Fl. Brit. India 5 : 622. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 324. 1940. *Quercus tribuloides* Smith in Rees, Cyclop. 29 : n. 13. 1819.

*Asm.* : Phul - hingori.

Tall trees ; bark dark grey. Leaves purplish green beneath. Flowers in spikes, dense, erect, paniced, greenish yellow. Fruits spiny.

*Fl. & Fr.* : October (Frts. following year).

19th mile forest, 85161.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, MYANMAR, CHINA.

**Lithocarpus dealbatus** (Hook. f. & Thomson ex Miq.) Rehder in J. Arn. Arb. 1 : 124. 1919 ; Haridasan & Rao. For. Fl. Meghalaya 2 : 859. 1987. *Quercus dealbata* Hook. f. & Thomson ex Miq., Fl. Brit. India 5 : 609. 1888. *Pasania dealbata* (Hook. f. & Thomson ex Miq.) Chatterjee in Fl. Assam 4 : 317. 1940.

Small trees ; bark ashy grey. Leaves often unequal, tomentose beneath. Flowers in paniced spikes, corymbose. Capsule scaly. Nut pyriform.

*Fl. & Fr.* : September - July.

Deban forest, 83544 ; 22nd mile, 87859 ; P. Kund, 96352.

*Distrib.* : INDIA : North - east India & Nilgiris ; BHUTAN.

**Quercus lamellosa** Smith in Rees, Cyclop. 29 : n. 23. 1814 ; Hook. f., Fl. Brit. India 5 : 606. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 308. 1940.

Nep. : *Bajrat*.

Lofty trees ; young parts tomentose. Male flowers in short solitary, axillary spikes ; female flowers in short spikes, 3 - 4 flowered. Young fruits spiny.

*Fl. & Fr.* : August - October (next year).

Miao forest, 39119.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA.

**Quercus semiserrata** Roxb., Fl. Ind. 3 : 641. 1832 ; Hook. f., Fl. Brit. India 5 : 604. 1888 ; Kanjilal *et al.*, Fl. Assam 4 : 308. 1940.

Tall trees, bole straight and buttressed ; bark dark grey. Male flowers in solitary spikes, 2 - 3 flowered ; female flower solitary or paired. Nut beaked.

*Fl. & Fr.* : October - June.

Miao forest, 81139 ; 10th mile forest, 87740.

*Distrib.* : INDIA : North east India ; MYANMAR, BANGLA DESH, MALAYA.

## ORCHIDACEAE

**Aerides multiflora** Roxb., Pl. Corom. 3 : 63. t. 271. 1820 & Fl. Ind. 3 : 475. 1832 ; Hook. f., Fl. Brit. India 6 : 44. 1890 ; Balakr., Fl. Jowai 2 : 479. 1983.

Epiphytic herbs ; stems short, stout, semi - erect. ; Racemes axillary, drooping, longer than leaves. Flowers pink.

*Fl. & Fr.* : May - August.

Near Ganga jheel, 87765.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; MYANMAR, MALAYA.

**Aerides odorata** Lour., Fl. Cochinch. 2 : 525. 1790 ; Hook. f., Fl. Brit. India 6 : 47. 1890 ; Katak, Orchid. Meghalaya 173. 1896.

Epiphytic herbs ; stems stout, semi - erect. Racemes lateral, arched or pendulous. Flowers pale pink or pinkish white.



*Fl. & Fr.* : May - August.

22nd mile M.V. road, 87823; 27th mile, M.V. road, 87833.

*Distrib.* : INDIA : Sikkim, North - east India ; MYANMAR, CHINA, MALAYA, THAILAND.

*Anoectochilus roxburghii* (Wallich) Lindley, Gen. & Sp. Orch. 499. 1840; Hook. f., Fl. Brit. India 6 : 95. 1890. Balakr., Fl. Jowai 2 : 470. 1983. *Chrysobaphus roxburghii* Wallich, Tent. Fl. Nep. t. 27. 1826.

Terrestrial herbs ; stems slender, erect or arched. Racemes slender, pubescent. Flowers pinkish - white with white tip.

*Fl. & Fr.* : October - November.

Miao forest, 83560.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

*Anoectochilus sikkimensis* King & Pantl. in J. Asiat. Soc. Beng. 65 : 124, t. 2. 1895 & in Ann. R. Bot. Gard. Calc. 8 : 294, t. 391. 1898.

Terrestrial orchid ; stem erect above, creeping below. Leaves elliptic ovate, upper surface reddish with golden veins ; lower surface uniformly dull red. Flowers few on long scape, brown with white tip.

*Fl. & Fr.* : September - November.

Salt lick forest, Miao, 83561.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; THAILAND.

*Arachnis cathcartii* (Lindley) J.J. Smith in Nat. Tijds. Ned. 72 : 75. 1912. *Vanda cathcartii* Lindley, Fol. Orchid, Vanda, 8. 1853. *Esmeralda cathcartii* (Lindley) Reichb. f. in Xen. Orch. 2 : 39. 1862. *Arachnanthe cathcartii* (Lindley) Benth. ; Hook. f., Fl. Brit. India 6 : 27. 1890.

Epiphytic orchid on tall trees ; stems long with many leaves. Leaves linear - oblong, recurved, apex unequally, 2 - lobed. Racemes as long as the leaves, lax flowered. Flowers dull yellow with transverse bands, lip 3 - lobed.

*Fl. & Fr.* : March - August.

22nd mile, M.V. road, 87806, 87856.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN.

*Arachnis clarkei* (Reichb. f.) J.J. Smith in Nat. Tijds. Ned. Ind. 72 76. 1912. *Esmeralda clarkei* Reichb. f. in Xen. Orch. 2 : 39. 1862. *Arachnanthe clarkei* Rolfe ; Hook. f. Fl., Brit. India 6 : 28. 1890.

Epiphytic herbs ; stems stout, arched or pendent ; racemes, few flowered, almost equalling the leaves. Flowers yellowish with transverse brown bands ; lip white with red spots.

*Fl. & Fr.* : November - January.

Kamlat to Walap, 88011.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; BHUTAN, THAILAND.

*Arundina graminifolia* (D. Don) Hochr. in Bull. N.Y. Bot. Gard. 6 : 270. 1910 ; Balakr., Fl. Jowai 2 : 498. 1983. *Bletia graminifolia* D. Don, Prodr. Fl. Nep. 29. 1825. *Arundina bambusifolia* Lindley, Gen. & Sp. Orch. 125. 1830 ; Hook. f., Fl. Brit. India 5 : 857. 1890.

Terrestrial herbs ; stems thick, many noded. Racemes 5 - 10 flowered. Flowers pinkish - white, lip pink with dark pink spots.

*Fl. & Fr.* : May - October.

M' Pen, 83148.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

*Bulbophyllum careyanum* (Hook.) Sprengel, Syst. Veg. 3 : 732. 1826 ; Hook. f., Fl. Brit. India 5 : 760. 1890 ; Katak, Orchid. Meghalaya 73. 1986. *Anisopetalum careyanum* Hook., Fl. Exot. t. 149. 1825.

Epiphytic herbs ; pseudobulbs ovoid, distant ; racemes at the base of the pseudobulbs, much shorter than leaves, densely many flowered. Flowers yellowish with purple spots.

*Fl. & Fr.* : October - December.

Deban forest, 83650, 36th mile, M.V. road, 87627.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, MYANMAR, THAILAND.

*Bulbophyllum delitescens* Hanc in J. Bot. 14 : 44. 1876. *B. mannii* Reichb. f. in Hook. f., Fl. Brit. India 5 : 780. 1890. *Cirrhopetalum setiferum* Rolfe in Kew Bull. 35. 1895.

Epiphytic herbs. Leaves petioled, oblong, cuneate, obtuse acute. Flowers few in umbels, sepals golden with many brown specks ; column dilated at the base, lip 2 - toothed.

*Fl. & Fr.* : August - November.

Deban, 85087.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL, BHUTAN, South - east ASIA.

**Bulbophyllum devangiriensis** Balakr. in J. Bombay Nat. Hist. Soc. 67 : 66. 1970. *B. uniflorum* Griffith *non* Hassk. 1884 ; Hook. f., Fl. Brit. India 5 : 755. 1890.

Epiphytic herbs ; pseudobulbs globose - oblong. Leaves petioled, oblong. Flowers with long pedicel, erect ; dorsal sepal prominent longer than the lateral sepals, orange - yellow with purple spots ; callus absent at the base of the lip.

*Fl. & Fr.* : August - November.

29th mile, M.V. road, 86629.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya, BHUTAN.

**Bulbophyllum helenae** (Kuntze) J.J. Smith in Bull. Jard. Bot. Buitz. Ser. 2. 8 : 24. 1912. *Phyllorchis helenae* Kuntze, Revis. Gen. Pl. 2 : 676. 1891. *Cirrhopetalum cornutum* Lindley in Bot. Reg. Misc. 75. 1838 ; Hook. f., Fl. Brit. India 5 : 774. 1890.

Epiphytic herbs ; pseudobulbs ovoid, close, 1 leaved. Leaves linear lanceolate, acute or obtuse. Inflorescence at the base of pseudobulbs, shorter than the leaves, 4 - 8 flowered. Flowers brownish ; lip recurved.

*Fl. & Fr.* : August - October.

29th mile, M.V. road, 86627.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR, THAILAND.

**Bulbophyllum ornatissimum** (Reichb. f.) J.J. Smith in Bull. Jard. Bot. Buitz. Ser. 2. 8 : 26. 1812 ; Katakai *et al.*, Threat. & End. Orch. Sikkim & North - Eastern India 10. 1984. *Cirrhopetalum ornatissimum* Reichb. f. ; Hook. f., Fl. Brit. India 5 : 773. 1890.

Epiphytes ; pseudobulbs ovoid, angulate. Leaves linear - oblong, obtuse. Flowers in short lateral scapes, purplish with pale yellow streaks. Scapes few flowered, semi umbellate, lip strigose.

*Fl. & Fr.* : February - May.

22nd mile forest M.V. road, 87814.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland.

**Bulbophyllum reptans** (Lindley) Lindley, Gen. & Sp. Orch. 51. 1830; Hook. f., Fl. Brit. India 5 : 768. 1890. *Tibrachia reptans* Lindley, Coll. Bot. t. 41 A. 1825.

Epiphytic herbs. pseudobulbs obpyriform, distant, 1 leaved. Leaves linear-oblong, acute. Inflorescence at the base of the pseudobulbs, erect, equal or shorter than the leaves, laxly flowered. Flowers greenish yellow.

*Fl. & Fr.* : November - March.

Kamlat to Walap, 88004.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, THAILAND.

**Bulbophyllum viridiflorum** (Hook. f.) Schltr. in Orchis 4 : 108. 1910. *Cirrhopetalum viridiflorum* Hook. f., Fl. Brit. India 5 : 779. 1890.

Epiphytic herbs ; pseudobulbs ovoid, crowded, 2 - leaved. Leaves lanceolate. Scapes lateral, longer than the leaves. Racemes many flowered, drooping. Flowers greenish purple.

*Fl. & Fr.* : February - May.

22nd mile, M.V. road, 87827.

*Distrib.* : INDIA : Uttar Pradesh, North - east India ; NEPAL.

**Bulbophyllum xylophyllum** Pax & Reichb. f. in Trans. Linn. Soc. 30 : 151. 1874 ; Hook. f., Fl. Brit. India 5 : 766. 1890.

Epiphytic herbs ; pseudobulbs, ovoids. Leaves broadly elliptic or orbicular, erect, leathery. Scapes erect, distant from the leaf. Flowers capitate, fleshy, greenish.

*Fl. & Fr.* : April - August.

22nd mile, M.V. road, 87830.

*Distrib.* : INDIA : Arunachal Pradesh, NEPAL, MYANMAR.

**Calanthe alismaefolia** Lindley, Fol. Orch. Calc. 8 : 1854 ; Hook. f., Fl. Brit. India 5 : 849. 1890.

Terrestrial herbs ; pseudobulbs cylindrical, tapering towards apex, few leaved. Leaves long petioled, elliptic acuminate. Scapes equal or shorter than the leaves, many flowered. Flowers white.

*Fl. & Fr.* : February - June.

Krosom to Shirong, 88066.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya.

**Calanthe densiflora** Lindley, Gen. & Sp. Orch. 250. 1833 ; Hook. f., Fl. Brit. India 5 : 855. 1890. *C. clavata* Lindley, Gen. & Sp. Orch. 251. 1833.

Terrestrial herbs ; stems short, sheathed. Leaves narrowly elliptic, acute. Racemes lateral, erect, dense flowered. Flowers pale yellow.

*Fl. & Fr.* : September - April.

29th mile, M.V. road, 86631 ; 22nd mile, M.V. road, 87857.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN.

**Ceratostylis subulata** Blume, Bijdr. 206. 1825. *C. teres* Reichb. f. in Bonpland, 2 : 89. 1854 ; Hook. f., Fl. Brit. India 6 : 825. 1890.

Epiphytic orchid ; stem terete, slender, erect, clustered, sheathed at base. Leaves terete ca 5 cm long. Inflorescence capitate, 1 - 2 flowered ; flowers small, pubescent, dull yellow.

*Fl. & Fr.* : April - September.

22nd, Mile, M.V. Road, 87832.

*Distrib.* : INDIA : Sikkim, North - east India.

**Cheirostylis griffithii** Lindley in J. Linn. Soc. 1 : 188. 1857 ; Hook. f., Fl. Brit. India 6 : 105. 1890 ; Katakai *et al.* Pl. Cons. Bull, 5 : 8. 1984.

Terrestrial orchids with prostrate stems. Leaves ca 3 cm, membranous, reflexed, shortly petioloid ; flowers in long slender few flowered racemes, white ; sepals connate to more than half ; lip clawed, apex toothed ; capsule pyriform.

*Fl. & Fr.* : December - April

22nd mile forest M.V. road, 87851.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; MYANMAR, THAILAND.

**Cheirostylis pusilla** Lindley, Gen. & Sp. Orch. 489. & 1835 ; Hook. f., Fl. Brit. India 6 : 105. 1890.

Terrestrial orchid ; stems prostrate, glabrous. Leaves small, ovate, acuminate ; scape slender, ciliate, 2 - 3 flowered ; flowers pink ; lip

2 - lobed, white.

*Fl. & Fr.* : October - March.

Deban, 86689.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; THAILAND.

**Chiloschista lunifera** (Reichb. f.) J.J. Smith ex Holttum in Kew Bull. 14 : 273, 1960. *Thrixspermum luniferum* Reichb. f. in Gard. Chron. 786. 1868. *Sarcochilus luniferus* (Reichb. f.) Benth. ex Hook. in Curtis, Bot. Mg. 115. t. 7044. 1889 ; Hook. f., Fl. Brit. India 6 : 37. 1890.

Epiphytic orchid ; stems minute or absent, leafless, becomes many flowered ; flowers yellowish with purple dots.

*Fl. & Fr.* : April - September.

25th mile, M.V. road, 87918.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND, MALAYA.

**Cleisostoma simondii** (Gagnepain) Seidenf. in Dansk. Bot. Ark. 29 : 66. 1975 ; Jain & Mehrotra, Pre. Inv. Orchidaceae India 31. 1984.

Epiphytic herbs ; stems erect ; leaves terete, flowers in extra axillary pendulous racemes, ca 1.5 cm long ; sepals and petals with longitudinal purple or brownish markings ; lip with purple markings ; spur infundibular.

*Fl. & Fr.* : April - October.

34th mile, M.V. road, 86690.

*Distrib.* : INDIA : Arunachal Pradesh ; BHUTAN, MYANMAR.

**Cleisostoma subulatum** Blume, Bijdr. 363. 1825. *Sarcanthus subulatus* (Blume) Reichb. f., Bonpland. 5 : 41. 1857. *S. secundus* Griffith, Notul. 3 : 362. 1851 ; Hook. f., Fl. Brit. India 6 : 67. 1890.

Epiphytic orchid ; stems slender, elongate, sheathed. Leaves linear - lanceolate, coriaceous, acuminate, constricted. Flowers on long racemes, brown.

*Fl. & Fr.* : September - November.

Hornbill, 87714.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, MALAYA, THAILAND.

**Coelogyne fuscescens** Lindley, Gen. Sp. Orch. 41. 1830 ; Hook. f., Fl. Brit. India 5 : 833. 1890.

**var. fuscescens**

Epiphytic orchid ; pseudobulbs oblong, curved and furrowed, sheathed at base. Leaves oblong - lanceolate, acute. Raceme from the base of pseudobulbs, erect, many flowered. Flowers white or pale brown with dark brown patches.

*Fl. & Fr.* : October - March.

40th mile, M.V. road, 87674.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR.

**Coelogyne prolifera** Lindley, Gen. Sp. Orch. 40. 1830 ; Hook. f., Fl. Brit. India 5 : 838. 1890.

Epiphytic orchid ; pseudobulbs, ovoid, shrunken, sheathed at base. Leaves elliptic lanceolate, long petioled. Racemes at the top of the pseudobulbs, zig - zag, few flowered. Flowers orange - brown.

*Fl. & Fr.* : February - June.

Ganga jheel, 87737.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL, MYANMAR.

**Cymbidium dayanum** Reichb. f. in Gard. Chron. 710. 1869. Holttum, Orchids, Malaya 1 : 519. 1957. *C. acutum* Ridley, J. Linn. Soc. 32 : 334. 1896. *C. simonsianum* King & Pantl. in Ann. Roy. Bot. Gard. Calc. 8 : 188, t. 250. 1898. *C. eburneum* var. *dayanum* Hook. f., Fl. Brit. India 6 : 12. 1890.

Terrestrial herbs. Leaves grassy, tips long narrow acute. Inflorescence more or less erect, 30 cm long, few flowered. Flowers white or mauve with a medium purple band ; lip white or pale - yellow with purple veins.

*Fl. & Fr.* : October - December.

Zero camp, 85190.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; MYANMAR, SUMATRA, MALAYA.

**Cymbidium eburneum** Lindley in Bot. Reg. t. 67. 1847 ; Hook. f., Fl. Brit. India 6 : 13. 1890. *C. syringodorum* Griffith, Notul 3 : 338. 1851.

Epiphytic orchid ; pseudobulbs short, covered with leaf sheath, many leaved. Leaves linear, acute. Scapes arise at base, much shorter than leaves, 1 or 2 - 3 flowered. Flowers wide open, white.

*Fl. & Fr.* : March - September.

22nd mile, M.V. road, 87824.

*Distrib.* : INDIA : West Bengal, Sikkim, North east India ; NEPAL.

**Dendrobium cathcartii** Hook. f., Fl. Brit. India 5 : 727. 1890 ; Katak, Orchid Meghalaya 58. 1986.

Epiphytic orchid ; stems slender, long, leafy throughout. Leaves linear - lanceolate, apex 2 - fid. Flowers in leaf - opposed short peduncles, yellowish.

*Fl. & Fr.* : March - October.

10th mile, M.V. road, 87764.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Dendrobium kentrophyllum** Hook. f., Fl. Brit. India 5 : 725. 1890 & Icon. Pl. t. 2021 ; Holttum, Fl. Malaya 1 : 339. 1957 ; D. Ridley, J. Linn. Soc. 32 : 250. 1896.

Epiphytic herbs ; stems 20 cm long, leafy to the end. Leaves oblique, slightly curved, flattened, acute. Flowers apparently terminal, pale - greenish yellow, sometimes pink outside ; lip without distinct side lobes, median yellow.

*Fl. & Fr.* : August - November,

27th mile, M.V. road, 84990.

*Distrib.* : INDIA ; Arunachal Pradesh, MYANMAR, SUMATRA, BORNEO, MALAYA.

**Dendrobium lituiflorum** Lindley in Gard. Chron. 372. 1856 ; Hook. f., Fl. Brit. India 5 : 740. 1890.

Epiphytic orchids ; pseudobulbs 60 cm long, pendulous, base very swollen. Leaves narrow, oblong - lanceolate, acute. Inflorescence from the nodes of leafless pseudobulbs, short. Flowers purple ; lip white with purple transverse strips.

*Fl. & Fr.* : February - September.

10th mile, M.V. road. 87790.



*Distrib.* : INDIA : Arunachal Pradesh, Assam, Manipur.

**Dendrobium longicornu** Lindley, Gen. Sp. Orch. 80. 1830 ; Hook. f., Fl. Brit. India 5 : 720. 1890.

Epiphytic orchid, stem cylindrical, erect, gradually tapering towards the base ; sheath ribbed. Leaves linear - lanceolate, 2 - fid at apex. Flowers on short terminal or lateral peduncles, white with yellow patch on lip.

*Fl. & Fr.* : September - January.

22nd mile, M.V. road, 87811.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland, Meghalaya ; NEPAL, BHUTAN.

**Dendrobium nobile** Lindley, Gen. & Sp. Orch. 79. 1830 ; Hook. f., Fl. Brit. India 5 : 740. 1890.

Epiphytes or lithophytes ; stems short or long stout, slightly laterally compressed. Leaves few at apex, oblong, obliquely notched at apex. Flowers on short peduncles, on leafy or leafless stems, purplish white.

*Fl. & Fr.* : April - September.

22nd mile, M.V. road, 87810.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, CHINA, THAILAND.

**Dendrobium ruckeri** Lindley in Bot. Reg. Misc. 8, t. 60. 1843 ; Hook. f., Fl. Brit. India 5 : 733. 1890.

Epiphytic orchids ; stem long slender, branched, pendulous. Leaves thin lanceolate, acuminate. Flowers leaf opposed, solitary or in pairs, primrose yellow ; lip brownish purple.

*Fl. & Fr.* : April - October.

22nd km point, M.V. road, 87805.

*Distrib.* : INDIA : Bihar, West Bengal, Sikkim, Arunachal Pradesh, Meghalaya ; BHUTAN.

**Dendrobium sulcatum** Lindley, in Bot. Reg. t. 65. 1830 ; Hook. f., Fl. Brit. India 5 : 749. 1890.

Epiphytes ; stems compressed ; tapering towards base, few noded, sheathed. Leaves acute - oblong, acuminate. Inflorescence subterminal,

pendulous, many flowered. Flowers yellow ; lip broadly ovate dark orange, ciliate at margins.

*Fl. & Fr.* : September - May.

22nd mile, M.V. road, 87836.

*Distrib.* : INDIA : North - east India.

**Diplomeris pulchella** D. Don, Prodr. Fl. Nep. 26. 1825 ; Hook. f., Fl. Brit. India 6 : 167. 1890. *D. longifolium* Lindley in Reg. t. 1499. 1832.

Terrestrial, small orchid with tuberous roots ; stems slender, with 1 - 2 leaves. Flowers terminal, large, white ; spur long slender.

*Fl. & Fr.* : August - December.

34th mile, M.V. road, 86696.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

**Eria acervata** Lindley in Paxt., Fl. Gard. 1 : 170. 1850 ; Hook. f., Fl. Brit. India 5 : 796. 1890 ; King & Pantl. in Ann. R. Bot. Gard. Calc. 8 : 123. t. 170. 1898 ; Balakr., Fl. Jowai 2 : 502. 1983.

Epiphytes with pseudobulbs 2 - 6 cm long, ca 1.5 cm thick, broad at base, compressed, ellipsoid. Leaves oblong, 10 - 14 × 1.0 - 1.6 cm, unequally notched and blunt at tip. Flowers in lateral racemes, creamy white, long pedicellate. Lip obovate, ca 8 mm ; lateral lobes obtuse ; mid lobe reflexed, disc 3 - ridged.

*Fl. & Fr.* : October - March.

Near Krosam, 88074.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ; BHUTAN, MYANMAR, MALAYA.

**Eria amica** Reichb. f. in Xenia Orch. 2 : 162. t. 3. f. 6 - 9. 1870 ; Hook. f., Fl. Brit. India 5 : 800. 1890. *E. confusa* Hook. f., Fl. Brit. India 5 : 796. 1890.

Epiphytes ; pseudobulbs club - shaped. Leaves narrow - lanceolate. Inflorescence lateral sub erect ; peduncles dense pubescent. Flowers pale yellow with dark purple keels.

*Fl. & Fr.* : March - August.

Ganga jheel, 87736 ; 82 km M.V. road, 78717.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL.

*Eria clausa* King & Pantl. in J. Asiat. Soc. Beng. 65. 721. 1896 ; Jain & Mehrotra, Orch. India 55. 1984.

Epiphytes ; pseudobulbs ovoid or ellipsoid, clothed at base. Leaves two or three, membranous. Inflorescence arise from the top of the pseudobulbs. Flowers pale green with brown stripes on lip.

*Fl. & Fr.* : February - March.

Krosam, 88074.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh.

*Eria clavicaulis* Wallich ex Lindley, Bot. Reg. Misc. 90. 1840 ; Hook. f., Fl. Brit. India 5 : 799. 1890. *E. khasiana* Lindley in J. Linn. Soc. 3 : 591. 1859.

Epiphytic orchid, stems sub - clavate, few noded, sheathed. Leaves terminal, lanceolate, shortly acuminate. Inflorescence terminal, shorter than leaves. Flowers white with purple edge.

*Fl. & Fr.* : February - July.

45th mile, M.V. road, 87935.

*Distrib.* : INDIA : North - east India ; South - east ASIA.

*Eria discolor* Lindley in J. Linn. Soc. 3 : 51. 1859. *E. pulchella sensu* Hook. f., Fl. Brit. India 5 : 801. 1890, *p.p. Tylosis discolor* (Lindley) Hook. f., Ann. Bot. Gard. Calc. 5 : 22. 1895.

Epiphytic orchid ; stem thick furrowed, constricted, 4 - 6 pseudobulbs in series. Leaves narrowly oblong, blunt. Inflorescence shorter than leaves, arise from beneath the leaves, few flowered. Flowers small, ochre - yellow, dull white with purplish - brown patch.

*Fl. & Fr.* : February - August.

22nd mile, M.V. road, 87814.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

*Eria ferruginea* Lindley in Bot. Reg. t. 35. 1839 ; Hook. f., Fl. Brit. India 5 : 804. 1890.

Epiphytic orchid, with creeping rhizome. Leaves 2, rarely 4, lanceolate, acuminate, coriaceous. Inflorescence brown tomentose, racemes, lateral, as long as leaves, sheathed. Flowers white with pink lip.

*Fl. & Fr.* : May - September.

22nd mile, M.V. road, 87812.

*Distrib.* : INDIA ; Arunachal Pradesh, Meghalaya.

**Eria paniculata** Lindley in Wallich, Pl. Asiat. Rar. : 32. t. 36. 1830 ; Hook. f., Fl. Brit. India 5 : 789. 1890 ; Balakr., Fl. Jowai 2 : 501. 1983.

Epiphytes ; stems close, many noded, drooping, sheathed. Leaves many, linear, acuminate, fleshy. Inflorescence racemes, simple or branched, terminal or sub - terminal, tomentose. Flowers pale green, lip white with purple spotted.

*Fl. & Fr.* : February - June.

22nd mile, M.V. road, 87804.

*Distrib.* : INDIA : North east India ; South - east ASIA.

**Eria pannea** Lindley in Bot. Reg. 64 Misc. 79. 1842 ; Hook. f., Fl. Brit. India 5 : 804. 1890. *E. calamifolia* Hook. f., Fl. Brit. India 6 : 191. 1890.

Epiphytes rhizomes, slender woolly with erect stem. Leaves linear, cylindric. Inflorescence 1 - 3 flowered. Flowers golden brown with dark brown lip.

*Fl. & Fr.* : May - September.

22nd mile, M.V. road, 87807 & 87738.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh.

**Eria pubescens** (Hook.) Lindley in Bot. Reg. sub. t. 904. 1825. *Dendrobium pubescens* Hook., Expt. Fl. t. 124. 1824. *Eria flava* Lindley, Gen. & Sp. Orch. 65. 1830 ; Hook. f., Fl. Brit. India 5 : 801. 1890.

Epiphytes, with stout creeping rhizome ; pseudobulbs erect, compressed, ellipsoid. Leaves lanceolate, coriaceous. Racemes lateral, erect, as long as the leaves, dense woolly. Flowers few green, scented.

*Fl. & Fr.* : February - September.

10th mile, M.V. road, 87747 ; 22nd mile, M.V. road, 87813.

*Distrib.* : INDIA : Uttar Pradesh, Meghalaya ; South - east ASIA.

**Eria stricta** Lindley, Coll. Bot. t. 41. B. 1821 ; Hook. f., Fl. Brit. India 5 : 791. 1890.

Epiphytes ; pseudobulbs close, cylindric, ribbed. Leaves 2, oblong lanceolate, acute, 2-fid at apex. Racemes, terminal, erect, pubescent, equal or longer than leaves. Flowers secund, white, woolly.

*Fl. & Fr.* : November - April.

Hornbill to Firmbase, 83692 ; 34th mile, M.V. road, 86698 ; 22nd mile, M.V. road 87825.

*Distrib.* : INDIA : Sikkim, North - east India ; THAILAND.

**Galeola altissima** (Blume) Reichb. f. in Xen. Orch. 2 : 77. 1865 ; Hook. f., Fl. Brit. India 6 : 89. 1890.

Saprophytic, vine like much branched orchid. Inflorescence loosely branched ; racemes laxly - flowered. Flowers bell - shaped, yellow with red marking at the base of lip.

*Fl. & Fr.* : July - October.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, MYANMAR, MALAYA, JAVA, SUMATRA.

**Galeola falconeri** Hook. f., Fl. Brit. India 6 : 88. 1890.

Terrestrial, saprophytic orchid, with elongate, stout root stock, stems tall erect, brown - purple. Panicle long, branched, many flowered. Flowers lax yellow.

*Fl. & Fr.* : June - August.

Salt lick forest, 83013.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya.

**Gastrochilus calceolaris** D. Don, Prodr. Fl. Nep. 32. 1825. *Saccolabium calceolare* Lindley, Gen. & Sp. Orch. 223. 1833 ; Hook. f., Fl. Brit. India 6 : 60. 1890.

Epiphytes ; stems short. Leaves oblong, obtusely 2 - lobed. Scape stout, 3 - 6 flowered. Flowers green with brownish spots.

*Fl. & Fr.* : March - September.

10th mile, M.V. road, 87767.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; NEPAL, BHUTAN, MYANMAR, CHINA, THAILAND.

**Gastrochilus dasypogon** (Smith) Kuntze, Rev. Gen. 2 : 661. 1891. *Aerides dasypogon* Smith in Rees. Cyclop. 39 : n. 10. 1819. *Saccolabium dasypogon* (Smith) Lindley : Hook. f., Fl. Brit. India 6 : 66. 1890.

Epiphytic orchid, without pseudobulbs ; stem very short pendulous. Leaves oblong, acute, minutely notched. Flowers in corymbose racemes, shorter than the leaves, bright yellow with brownish purple spots.

*Fl. & Fr.* : November - March.

16th mile, M.V. road, 85160.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya.

**Goodyera procera** (Ker Gawler) Hook., Exot. Fl. t. 39. 1823 ; Hook. f., Fl. Brit. India 6 : 111. 1890. *Neottia procera* Wallich ex Ker Gawler in Bot. Reg. t. 629. 1822.

Terrestrial orchid ; stout. Leaves elliptic - lanceolate, cuneate at base, acuminate, sheathed. Spikes erect, long, pubescent, many flowered. Flowers dense, white, scented.

*Fl. & Fr.* : March - August.

10th mile, M.V. road, 87782.

*Distrib.* : INDIA : Throughout sub - tropical areas ; CHINA, SRI LANKA, THAILAND.

**Habenaria furcifera** Lindley, Gen. & Sp. Orch. 319. 1835 ; Hook. f., Fl. Brit. India 6 : 149. 1890.

Terrestrial orchids ; stem ca 45 cm long. Leaves elliptic, acute or acuminate. Inflorescence long, lax, many - flowered. Flowers green ; lip longer than the ovary.

*Fl. & Fr.* : July - November.

Deban river bed, 85067.

*Distrib.* : INDIA : Uttar Pradesh, Bihar, West Bengal, Sikkim, North east India.

**Hetaeria rubens** (Lindley) Benth. ex Hook. f., Fl. Brit. India 6 : 115. 1890. *Rhamphidia rubens* Lindley in J. Linn. Soc. 1 : 182. 1857.

Terrestrial herbs ; stems sub - erect, long. Leaves ovate - oblong or elliptic, base oblique, acute. Racemes long, pubescent, many flowered. Flowers greenish - purple.

*Fl. & Fr.* : December - July.

17th mile, M.V. road, 87756.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, THAILAND.

**Liparis assamica** King & Pantl. in Ann. R. Bot. Gard. Calc. 8 : 36. t. 50. 1898.

Epiphytic herbs ; pseudobulbs tufted, ovoid - cylindric, sheathed. Leaves 2 - 4, membranous, acute or acuminate. Inflorescence 15 - 30 cm long, sub - pendulous, terete. Flowers golden brownish ; lip shorter than the petal, broadly oblong or ovate, column 2 - winged.

*Fl. & Fr.* : October - March.

Near 40th mile, I.B., 87675.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

**Liparis bootanensis** Griffith, Itin. Notes, 98. 1837 ; Hook. f., Fl. Brit. India 5 : 700. 1890.

Epiphytes ; pseudobulbs oblong, close, 1 - leaved. Leaves lanceolate, acuminate. Inflorescence a raceme, from the base of the old pseudobulbs, as long as leaves, sheathed ; racemes erect, many flowered. Flowers lax, ochreous.

*Fl. & Fr.* : September - April.

22nd mile, M.V. road, 87826.

*Distrib.* : INDIA : Sikkim, North east India ; NEPAL, MYANMAR, CHINA, BHUTAN, THAILAND, MALAYA.

**Liparis delicatula** Hook. f., Icon. Pl. t. 1889 ; Hook. f., Fl. Brit. India 5 : 705. 1890.

Epiphytes ; pseudobulbs ovoid or oblong, clustered, 2 leaved. Leaves elliptic - lanceolate, acute. Racemes much longer than the leaves, slender, erect or crowded, laxly few flowered. Flowers greenish - yellow.

*Fl. & Fr.* : September - April.

25th mile, M.V. road, 87919.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, Arunachal Pradesh, Meghalaya ; THAILAND.

**Liparis distans** C.B. Clarke in J. Linn. Soc. 25 : 71. t. 29. 1889 ; Hook. f., Fl. Brit. India 5 : 704. 1890.

Epiphytic orchid ; pseudobulbs elongate, conical, 2 leaved. Leaves oblanceolate, acuminate. Scape winged ; racemes few flowered. Flowers greenish.

*Fl. & Fr.* : October - March.

26th mile, M.V. road, 86686.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland.

**Liparis plantaginea** Lindley, Gen. & Sp. Orch. 29. 1830 ; Hook. f., Fl. Brit. India 5 : 702. 1890.

Epiphytic ; pseudobulbs ovoid - oblong, sheath large. Leaves linear or oblong - lanceolate, acute. Inflorescence flexuous. Flowers greenish.

*Fl. & Fr.* : June - October.

22nd mile, M.V. road, 87858.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Nagaland, Meghalaya.

**Liparis viridiflora** (Blume) Lindley, Gen. & Sp. Orch. 31. 1830 ; Hook. f., Fl. Brit. India 5 : 704. 1890. *Malaxis viridiflora* Blume, Bijdr. 392. t. 54. 1825.

Epiphytes ; pseudobulbs ovoid or sub globose, compressed, sheathed, 2 - leaved. Leaves elliptic - lanceolate or oblanceolate, acute. Inflorescence arising from the top of pseudobulbs, longer than leaves, many flowered. Flowers yellowish.

*Fl. & Fr.* : November - April.

Firmbase, 83704 ; 34th mile, M.V. road, 87616 ; 10th mile, M.V. road, 83638.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Nagaland, Manipur, Mizoram, Western Ghats ; South - east ASIA.

**Oberonia iridifolia** (Roxb.) Lindley, Gen. Sp. Orch. 15. 1830 ; Hook. f., Fl. Brit. India 5 : 675. 1890. *Cymbidium iridifolium* Roxb., Hort. Beng. 63. 1814.



Epiphytes ; stems short. Leaves few, radical, ensiform, acute. Inflorescence amongst the leaves, longer than leaves ; peduncles narrow winged, sheathed. Racemes slender, recurved, dense - flowered. Flowers yellowish or greenish.

*Fl. & Fr.* : August - December.

Deban, 84931.

*Distrib.* : INDIA : Throughout India ; South - east ASIA.

*Oberunia myriantha* Lindley, *Ful. Orch.* Oberon, 4, 1882 ; Hook. f., *Fl. Brit. India* 5 : 679. 1890.

Epiphytes ; stems short, stout. Leaves few, radical ensiform, falcate. Inflorescence from amongst the leaves, longer than the leaves. Racemes slender, decurved, dense flowered. Flowers in whorls, brownish.

*Fl. & Fr.* : April - October.

22nd mile, M.V. road, 87803.

*Distrib.* : INDIA : Sikkim, North - east India.

*Otochilus fuscus* Lindley, *Gen. & Sp. Orch.* 35. 1830 ; Hook. f., *Fl. Brit. India* 5 : 844. 1890.

Epiphytes ; pseudobulbs cylindric, sheathed. Leaves linear lanceolate, acuminate. Inflorescence equal or longer than leaves, slender, arched. Racemes many flowered. Flowers white.

*Fl. & Fr.* : November - April.

22nd mile, M.V. road, 87803.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL.

*Otochilus porrectus* Lindley, *Gen. & Sp. Orch.* 36. 1830 ; Hook. f., *Fl. Brit. India* 5 : 844. 1890.

Epiphytes ; pseudobulbs sub - cylindric or sub - clavate sheathed. Leaves elliptic lanceolate, acuminate. Inflorescence shorter than the leaves, drooping. Racemes long, lax - flowered. Flowers white.

*Fl. & Fr.* : August - December.

34th mile, M.V. road, 87618.

*Distrib.* : INDIA : Sikkim, North - east India. MYANMAR.

*Paphiopedilum wardii* Summerh. in *Gard. Chron. Ser.* 3, 92, 446. 1932 ; Hegde, *Orch. Arunachal Pradesh* 33. 1984.

Terrestrial orchid. Leaves 3 - 4, oblong elliptic, 15 × 5 cm. Inflorescence 1 - flowered, 15 - 20 cm; dorsal sepal mottled with pale and dark green, ventral spotted purple. Labellum 4 - 5 cm long, obtuse, green spotted with red staminodes, 3 - lobed.

*Fl. & Fr.* : December - February.

Kingdon Ward collected from Lohit valley, but it could not be recollected during recent past.

*Distrib.* : INDIA : Arunachal Pradesh.

*Phaius mishmensis* Reichb. f. in Bonpland, 5 : 43. 1857 ; Hook. f., Fl. Brit. India 5 : 817. 1890.

Terrestrial orchids ; stems tall, cylindrical, sheathed, many noded. Leaves few usually towards apex, elliptic - lanceolate, acute. Racemes axillary, as long as leaves, lax flowered. Flowers pink.

*Fl. & Fr.* : October - April.

Hombill to Firmbase, 83699 ; Deban, 85148 ; 27th mile, M.V. road, 86641.

*Distrib.* : INDIA : Sikkim, North - east India.

*Phaius tankervilleae* (Banks ex L'Herit.) Blume, Mus. 2 : 177. 1852. *Limodorum tankervilleae* Banks ex L'Herit., Sert. Angl. 28. Jan. 1789. *Limodorum tankervilleae* Aiton, Hort. Kew 3 : 302. t. 12. Aug. - Oct. 1789. *Phaius walllichii* Lindley ; Hook. f., Fl. Brit. India 5 : 816. 1890.

Terrestrial orchid ; pseudobulbs conical, close ; stems formed of long leaf sheaths, few leaved. Leaves elliptic - lanceolate, acuminate. Inflorescence from the base of the pseudobulbs, erect, very long ; racemes many flowered. Flowers white without brownish within.

*Fl. & Fr.* : March - September.

10th mile, M.V. road, 87300.

*Distrib.* : INDIA : Sikkim, North - east India ; MYANMAR, SRI LANKA, THAILAND.

*Phalaenopsis manni* Reichb. f. in Gard. Chron. 902. 1871 ; Hook. f., Fl. Brit. India 6 : 30. 1890.

Epiphytic orchid ; stem almost absent. Leaves few obovate oblong, sub - clavate, acute. Racemes equal or longer than the leaves, rarely branched, many flowered. Flowers golden - yellow ; lip light yellow.

*Fl. & Fr.* : March - September.

Ganga jheel, 87734.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh ; NEPAL.

**Phalaenopsis parishii** Reichb. f. in Bot. Zeit, 146. 1865 ; Hook. f., Fl. Brit. India 6 : 31. 1890.

Epiphytic herbs ; stem absent. Leaves elliptic - oblong. Racemes as long as leaves, few flowered. Flowers white ; lip yellowish with purple spots.

*Fl. & Fr.* : March - September.

Ganga jheel, 87739.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

**Pholidota articulata** Lindley, Gen. & Sp. Orch. 38. 1830 ; Hook. f., Fl. Brit. India 5 : 844. 1890.

Epiphytic herbs ; pseudobulbs jointed, elongate, sub cylindrical, branched with new shoots arising at apex. Leaves elliptic lanceolate, acute. Inflorescence from the top of the pseudobulbs, arched, many flowered. Flowers dull white.

*Fl. & Fr.* : July - April.

Ganga jheel, 87733 ; 22nd mile, M.V. road, 87801.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; THAILAND, CHINA, MALAYA.

**Pholidota convallariae** (Reichb. f.) Hook. f. in Hook. Icon. Pl. 19 : t. 1880. 1889 & Fl. Brit. India 5 : 846. 1890. *Coelogyne convallariae* Reichb. f. in Fl. 277. 1872.

Epiphytes, with long scattered roots ; pseudobulbs erect, sub cylindrical, 2 - leaved. Leaves linear, erect obtuse. Racemes arise from the base of the pseudobulbs, erect, shorter than the leaves, many flowered. Flowers white with cymbiform lip.

*Fl. & Fr.* : April - June.

34th mile, M.V. road, 87610, 87936 ; 22nd mile, M.V. road, 87809.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; MYANMAR.

**Pholidota imbricata** (Roxb.) Lindley in Hook. Exot. Fl. t. 138. 1825 ; Hook. f., Fl. Brit. India 5 : 845. 1890. *Cymbidium imbricatum* Roxb., Hort. Beng. 63. 1814.

Epiphytes : pseudobulbs oblong, grooved, 1 leaved. Leaves elliptic lanceolate, acute. Racemes from the base of pseudobulbs, drooping, slender, elongate, many flowered. Flowers dull white.

*Fl. & Fr.* : June - December.

Hornbill to Firmbase, 83690 ; Ganga jheel, 87766.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, THAILAND.

**Pholidota rubra** Lindley, Gen. & Sp. Orch. 37. 1830 ; Hook. f., Fl. Brit. India 5 : 847. 1890.

Epiphytes : pseudobulbs uninodal, close, with new shoots arising at base, 2 - leaved. Leaves elliptic - lanceolate, acuminate. Racemes arise from the base of the pseudobulbs, drooping or arched, many lax flowered. Flowers pale - brown.

*Fl. & Fr.* : October - March.

40th mile, M. V. road, 87676.

*Distrib.* : INDIA : Sikkim, North east India ; BHUTAN, MYANMAR.

**Pleione maculata** (Lindley) Lindley in Pant. Fl. Gard. 2. t. 39. 1851. *Coelogyne maculata* Lindley, Gen. & Sp. Orch. 43. 1830 ; Hook. f., Fl. Brit. India 5 : 841. 1890.

Epiphytes or lithophytes : pseudobulbs crowded, green, bottle shaped, 2 leaved. Leaves lanceolate, sheaths tubular. Scape lateral, 1 - flowered. Flowers white with yellow blotch.

*Fl. & Fr.* : October - April.

35th mile, M. V. road, 87626 ; 22nd mile M. V. road, 87819.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, THAILAND.

**Pleione praecox** (J.E. Smith) D. Don, Prodr. Fl. Nep. 37. 1825. *Epidendrum praecox* J.E. Smith Exot. Bot. t. 97. 1904. *Coelogyne praecox* Lindley ; Hook. f., Fl. Brit. India 5 : 840. 1890. *C. wallichiana* Lindley. *Pleione wallichiana* Lindley.

Epiphytes or lithophytes ; pseudobulbs large, flask shaped with depressed apex. Leaves 2, broadly lanceolate or oblanceolate, acuminate. Flowers 1 rarely 2, large, rose - purple ; lip pinkish - white with purple blotches.

*Fl. & Fr.* : October - November.

On the way to Kumon Bum, 78779.

*Distrib.* : INDIA : West Bengal, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Meghalaya ; NEPAL, BHUTAN, MYANMAR, THAILAND.

*Podochilus khasianus* Hook. f., Fl. Brit. India 6 : 81. 1890 ; Katak, Orchid Meghalaya 190. 1986.

Epiphytes ; stems close, slender, erect or sub - erect. Leaves linear, acute, sheathed. Inflorescence terminal, short, few - flowered. Flowers white.

*Fl. & Fr.* : July - December.

Deban, 83662 ; 22nd mile, M.V. road, 87835.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

*Pteroceras suaveolens* (Roxb.) Holttum in Kew Bull. 14 ( 1 ) : 271. 1960. *Aerides suaveolens* Roxb., Fl. Ind. 3 : 473. 1832. *non* Blume. *Sarcochilus suaveolens* ( Roxb.) Hook. f., Fl. Brit. India 6 : 33. 1890.

Epiphytes ; stems slender, arched, sheathed. Leaves lorate, obliquely acute. Racemes as long as the leaves, few - flowered. Flowers yellow with brown spots.

*Fl. & Fr.* : May - December.

15th mile, M. V. road, 85191.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ; MYANMAR, THAILAND.

*Schoenorchis gemmata* (Lindley) J.J. Smith, Nat., Tijdis. Ned. Ind. 72. 101. 1912. *Saccolabium gemmatum* Lindley in Bot. Reg. Misc. 50. 1838 ; Hook. f., Fl. Brit. India 6 : 55. 1890.

Epiphytes ; stems slender, curved. Leaves semi - terete. Racemes longer than the leaves, branched, many flowered. Flowers lax - pink.

*Fl. & Fr.* : March - October.

Hornbill, 87713 ; Ganga jheel, 87748.

Distrib. : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MYANMAR, MALAYA.

**Tainia latifolia** (Lindley) Benth. ex Hook. f., Fl. Brit. India 5 : 820. 1890 ; Kataki, Orchid Meghalaya 106. 1986. *Ania latifolia* Lindley, Gen. Sp. Orch. 130.1831.

Terrestrial herbs ; pseudobulbs ensiform, warted, sheathed. Leaves broadly elliptic, acute. Inflorescence a long raceme terete, lax flowered. Flowers pale brown.

*Fl. & Fr.* : March - September.

Ganga jheel, 87731.

Distrib. : INDIA : Sikkim, North - east India ; MYANMAR.

**Tropidia angulosa** (Lindley) Blume in Coll. Orch. Arch. Ind. 122. 1858 ; Hook. f., Fl. Brit. India 6 : 92. 1890. *Cnemidia angulosa* Lindley, Bot. Reg. 19 ; t. 1618. 1833.

Terrestrial ; stem tall, thick near the base. Leaves two, broad elliptic, cordate at base. Inflorescence terminal, tall, many flowered. Flowers crowded, white or pale - yellowish

*Fl. & Fr.* : September - January.

Deban , 84933.

Distrib. : INDIA : Sikkim, Arunachal Pradesh, Assam, Orissa, South India.

**Tropidia curculigoides** Lindley, Gen. & Sp. Orch. 497. 1840 ; Hook. f., Fl. Brit. India 6 : 93. 1890.

Terrestrial ; stem tall, erect, thick near the base. Leaves more than six, scattered, elliptic - lanceolate . Inflorescence terminal , leaf opposed, few flowered. Flowers white tinged with yellow.

*Fl. & Fr.* : November - March.

27 th mile, M. V. road, 87816.

Distrib. : INDIA : Sikkim , Arunachal Pradesh, Assam, Manipur.

**Uncifera acuminata** Lindley in J. Linn. Soc. 3 : 40, 1859 ; Hook. f., Fl. Brit. India 6 : 65. 1890.

Epiphytic orchid ; stem short, slender. Leaves linear or oblong lanceolate, acuminate. Inflorescence short, leaf - opposed, 8 - 12 flowered. Flowers pale - lemon coloured.

*Fl. & Fr.* : July - November.

Hornbill, 87716.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya ;  
BHUTAN, NEPAL.

*Vandopsis undulata* (Lindley) J.J. Smith in Nat. Tijds. Ned. Ind. 72 : 77. 1912 ; Holttum, Orchid Malaya 1 : 647. 1957. *Vanda undulata* Lindley in J. Linn. Soc. 3 : 42. 1859. *Stauroopsis undulatus* (Lindley) Benth. ex Hook. f., Fl. Brit. India 6 : 27. 1890.

Epiphytic orchid, with long climbing stem ; root many, free  
Leaves leathery, oblong. Inflorescence long - stalked, densely flowered.  
Flowers white flushed with pink, fragrant.

*Fl. & Fr.* : March - September.

10th mile, M. V. road, 87751.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Assam, Meghalaya ;  
BHUTAN, NEPAL, MYANMAR.

### ZINGIBERACEAE

*Alpinia nigra* (Gaertner) Burt in Notes R. Bot. Gard. Edinb. 35 : 213. 1977. *Zingiber nigrum* Gaertner, Fruct 1 : 35, t. 12. 1788. *Alpinia allughas* (Retz.) Rosc. in Trans. Linn. Soc. 8 : 346. 1807 ; Rao & Verma in Bull. Bot. Surv. India 14 : 13. 1972. *Heritiera allughas* Retz., Observ. 6 : 17. t. 1. 1791.

Rhizome creeping ; stem 1 - 2 m high. Panicles 10 - 63 cm long.  
Rachis pubescent, calyx pinkish ; corolla pinkish - white.

*Fl. & Fr.* : May - February.

M' Pen check gate, 83176 ; 20 km point on M.V. road,  
83191 ; 77th mile M.V. road, 99594.

*Distrib.* : INDIA : North - east India ; NEPAL, SRI LANKA  
MALAYA .

*Amomum aromaticum* Roxb., Fl. Ind. 1 : 45. 1820 ; Rao & Verma in Bull. Bot. Surv. India 14 : 135. 1972.

Rhizome long, creeping stems ca 1 m high, aromatic on crushing.  
Inflorescence spikes, clavate, Flowers white, calyx pinkish ; corolla white

*Fl. & Fr.* : April - November.

Hornbill to Firmbase, 83698 ; Haldibari, 99433.

*Distrib.* : INDIA : West Bengal, North - east India.

*Amonum dealbatum* Roxb., Fl. Ind. 1 : 43. 1820 ; Rao & Verma in Bull. Bot. Surv. India 14 : 175. 1972.

Tall herbs with creeping rhizome ; stems 10 - 25 cm long. Spikes 1 - 2 around each stem ; sub globose. Flowers white ; corolla tube slightly shorter than calyx.

*Fl. & Fr.* : April - December.

16th mile on M. V. road , 85183.

*Distrib.* : INDIA : West Bengal, North - east India ; NEPAL.

*Catimbiom malacense* (Burm. f.) Holttum in Gard. Bull. Singapore 13 : 155. 1950. *Maranta malacensis* Burm. f., Fl. Ind. 2. 1768. *Alpinia malacensis* (Burm. f.) Rosc. in Trans. Linn. Soc. 8 : 345. 1807 ; Rao & Verma in Bull. Bot. Surv. India 14 : 140 1972.

Rhizome creeping ; stem 1.2 - 2 m high. Racemes erect or cernuous. Rachis villous, erect. Flowers deep yellow with red.

*Fl. & Fr.* : March - December.

Zero camp, 85187 ; Deban , 87793.

*Distrib.* : INDIA : North - east India, Malabar.

*Cautleya gracilis* ( J.E. Smith ) Dandy in J. Bot. 70 : 328. 1932 ; Rao & Verma in Bull. Bot. Surv. India 14 : 121. 1972. *Roscoea gracilis* J. E. Smith in Trans. Linn. Soc. 13 : 460. 1822. *C. lutea* (Royle) Hook. f. in Bot. Mag. t. 6991. 1888 ; Baker in Fl. Brit. India 6 : 208. 1890.

Terrestrial or epiphytic herbs ; stems 0.3 - 0.5 m high. Spikes terminal, lax, 1 - 6 flowered ; rachis purplish green ; bracts 1 - flowered. Flowers yellow.

*Fl. & Fr.* : May - December.

*Distrib.* : INDIA, Kashmir, Uttar Pradesh, Sikkim, North east India.

*Costus speciosus* (Koenig) J.E. Smith in Trans. Linn. Soc. 1 : 249. 1791 ; Baker in Fl. Brit. India 6 : 249. 1891 ; Balakr., Fl. Jowai 2 : 519. 1983. *Banksia speciosa* Koenig in Retz. Obs. Bot. 3 : 75. 1783.

Stems 1 - 3 m high, spirally twisted. Spikes terminal, ovoid or ellipsoid. Bracts greenish red, becoming bright red in age ; corolla white



*Fl. & Fr.* : June - December.

Miao forest 83121 ; Kamlat to Walap, 87991.

*Distrib.* : INDIA : North east and South India ; NEPAL, BHUTAN, SRI LANKA, CHINA, MALAYSIA.

*Curcuma aromatica* Salisb., *Parad. Lond.* 2. t. 96. 1807 ; Rao & Verma in *Bull. Bot. Surv. India* 14 : 122. 1972.

Rhizome branched, greyish outside, yellow and strongly aromatic inside. Spikes ca 20 cm long ; bracts lower green, upper mauve. Flowers as long as bracts, blood red.

*Fl. & Fr.* : January - November.

Firmbase, 83735.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, SRI LANKA.

*Globba clarkel* Baker in *Fl. Brit. India* 6 : 201. 1890 ; Rao & Verma in *Bull. Bot. Surv. India* 14 : 118. 1972.

Perennial herbs, with slender rhizome : stems 0.5 - 1.7 m. Panicles terminal, pubescent. Flowers 1 - 3 together, pale yellow or brownish yellow.

*Fl. & Fr.* : April - December.

Noa - Dihing river, 84934 ; 77th mile M.V. road 99593

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, THAILAND.

*Globba multiflora* Wallich ex Baker in *Fl. Brit. India* 6 : 202. 1890 ; Rao & Verma in *Bull. Bot. Surv. India* 14 : 118. 1972.

Perennial herbs ; stems 0.5 - 1 m high. Panicles ca 50 cm long ; rachis panicles and branches villous. Flowers 6 - 9 together, yellow.

*Fl. & Fr.* : April - October.

Salt lick forest, Miao. 83551

*Distrib.* : INDIA : North - east India

*Hedychium coccineum* J.E. Smith in *Rees. Cyclop.* 17 : 5. 1811 ; Baker in *Fl. Brit. India* 6 : 23. 1892 ; Balakr., *Fl. Jowai* 2 : 528. 1983.

Perennial herbs ; stems 1 - 2 . 0 m high, purplish and villous beneath. Spikes *ca* 25 cm long. Flowers bright crimson - red ; corolla as long as the bracts

*Fl. & Fr.* : May - December.

27th mile, camp on M.V. road, 84978 ; Dola, 99530.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, INDO - CHINA.

**Hedychium coronarium** Koenig, in Retz., Observ. Bot. 3 : 73. 1783 ; Rao & Verma in Bull. Bot. Surv. India 14 : 128. 1972.

Perennial herbs ; stems *ca* 2 m high. Spikes cone - like, 10 - 18 cm long, 3 - 9 flowered. Flowers fragrant, white with a pale yellow blotch.

*Fl. & Fr.* : June - December.

M Pen chack gate, 83170.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, SRI LANKA, MALAYA.

**Hedychium venustum** Wight, Icon. t. 2012, 1853 ; Baker in Fl. Brit. India 6 : 226 1892

Perennial herbs ; stems *ca* 1 - 5 m high. Spike lax flowered ; bracts small, single flowered. Flowers whitish ; calyx exceeding the bract.

*Fl. & Fr.* : June - November.

Imbeong, 87613.

*Distrib.* : INDIA : Arunachal Pradesh, Nilgiris.

**Hedychium villosum** Wallich in Roxb., Fl. Ind. 1 : 12. 1820 ; Rao & Verma in Bull. Bot. Surv. India 14 : 131. 1972.

Terrestrial or epiphytic herbs ; stems *ca* 0. 3 m high. Spikes *ca* 2 cm long, lax flowered ; bracts brownish, 2 - 3 flowered, villous. Flowers fragrant, white.

*Fl. & Fr.* : December - October.

10th mile, M.V. road, 87763.

*Distrib.* : INDIA, North - east India ; NEPAL, BANGLA DESH.

**Hitchinea careyana** Benth. in Benth. & Hook., Gen. Pl. 3 : 643. 1883 ; Baker in Fl. Brit. India 6 : 225. 1892 ; Balakr., Fl. Jowai 2 : 525. 1983.

Perennial herbs ; stems *ca* 0 . 2 m tall. Spikes terminal, cone like, *ca* 2 cm long ; bracts greenish or greenish - white, 3 - 6 flowered. Flowers pinkish - purple.

*Fl. & Fr.* : July - December.

M' Pen, 83167 : On the way to Vijayanagar, 99567.

*Distrib.* : INDIA, North - east India, BANGLA DESH.

### MARANTACEAE

***Phrynium capitatum*** Willd., Sp. Pl. 1 : 17. 1797 ; Baker in Fl. Brit. India 6 : 258. 1892 ; Deb, Fl. Tripura 2 : 383. 1938.

Herbs with creeping root - stock. Leaves solitary terminal, 25 - 50 x 10 - 20 cm, ovate - oblong or ovate. Flowers purple ; corolla lobes longer than the tube.

*Fl. & Fr.* : June - November.

P. Kund, 99454.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYSIA.

***Phrynium placentarium*** (Lour.) Merr. in Phillip. J. Sci. 15 : 230. 1919 ; Balakr., Fl. Jowai 2 : 531. 1983. *Phyllodes placentaria* Lour., Fl. Cochinch. 13. 1790. *Phrynium parviflorum* Roxb., Fl. Ind. 1 : 7. 1820 ; Baker in Fl. Brit. India 6 : 259. 1892 ; Rao & Verma in Bull. Bot. Surv. India 14 : 141. 1972.

Rhizomes *ca* 1 cm thick ; capitulae sessile, *ca* 4 cm across. Flowers white ; sepals white with pinkish tip ; corolla white. Capsule wall membranous.

*Fl. & Fr.* : July - December.

20 km point on M.V. road, 83195.

*Distrib.* : INDIA : North east India ; NEPAL, CHINA, THAILAND.

***Phrynium pubinerve*** Blume, Enum. Pl. Java 38. 1827 ; Rao & Verma in Bull. Bot. Surv. India 14 : 141. 1972 ; Balakr., Fl. Jowai 2 : 531. 1983. *P. capitatum non* Willd. ; Baker in Fl. Brit. India 6 : 258. 1892.

Rhizome *ca* 1 cm thick ; capitulae sub sessile , *ca* 6 cm across. Flowers white or pink - red ; corolla purplish - red. Capsule wall woody.

*Fl. & Fr.* : April - December.

29th mile, M.V. road, 86618.

*Distrib.* : INDIA : North - east India ; NEPAL.

### CANNACEAE

*Canna coccinea* Mill., Gard. Dict. ed. 8. no. 3. 1768 ; Balakr., Fl. Jowai 2 : 532. 1983. *C. indica non* L. : Baker in Fl. Brit. India 6 : 260. 1892.

Erect herbs with tubercous perennial rootstock. Inflorescence simple ; corolla red with yellow top. Spathulate bright red ; lip shorter, red with pale yellow at base.

*Fl. & Fr.* : December - October.

Zero camp, 83738.

*Distrib.* : INDIA : Throughout India ; NEPAL, SRI LANKA, MALAYA.

### MUSACEAE

*Ensete glaucum* (Roxb.) Cheesman in Kew Bull. 1947 : 101. 1948 ; Hara, Fl. E. Himal. 3 : 136. 1975. *Musa glauca* Roxb., Fl. Corom. t. 300. 1819 ; Baker in Fl. Brit. India 6 : 262. 1892. *M. nepalensis* Wallich in Roxb., Fl. Ind. 2 : 492. 1824.

Pseudo - stems thick ca 4 m high cylindric . Spikes drooping from the base ; bracts greenish, many flowered ; calyx pale , ca 2.5 cm ; corolla much shorter than the calyx . Fruits with black globose seeds.

*Fl. & Fr.* : February - September.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, MALAYSIA.

*Musa velutina* Wendl. & Drude in Regal. Garten. Fl. 24 : 65. t. 823. 1875 ; Baker in Fl. Brit. India 6 : 263. 1892 ; Balakr., Fl. Jowai 2 : 531. 1983.

Pseudo stem 1.0 - 1.5 m, pale red at base, purple blotched upwards ; bracts densely pubescent., red - purple. Flowers orange - yellow, arranged in a single row. Fruits pinkish - red ; seeds angular, black.

*Fl. & Fr.* : February - October.

Miao forest, 83124 ; 27th mile, forest, 87887.

*Distrib.* : INDIA : North - east India.

## HYPOXIDACEAE

**Curculigo capitulata** (Lour.) Kuntze, Rev. Gen. Pl. 2 : 703. 1891. *Leucojum capitulatum* Lour., Pl. Cochinch. 199. 1790. *Curculigo recurvata* Dryand in Ait. Hort. Kew ed. 2 : 253. 1811 ; Hook. f., Fl. Brit. India 6 : 278. 1892. *Molineria capitulata* (Lour.) Herbert, Amaryllidaceae 84. 1837 ; Balakr., Fl. Jowai 2 : 533. 1983.

Erect herbs ca 1.5 m high. Scapes stout, slender ; bracts spathaceous, villous. Flowers pedicellate in heads, villous, yellow.

*Fl. & Fr.* : March - December

10th mile , M.V. road, 87789.

*Distrib.* : INDIA : West Bengal, North east India ; NEPAL, MYANMAR, SRI LANKA, CHINA, MALAYA.

**Curculigo crassifolia** (Baker) Hook. f., Fl. Brit. India 6 : 279. 1892. *Molineria crassifolia* Baker in J. Linn. Soc. 17 : 121. 1878.

Erect herbs ; scape flattened, stout, densely tomentose. Flowers in long dense racemes. Fruits greenish with persistent black calyx.

*Fl. & Fr.* : June - November.

20 km, M.V. road, 83196 ; Deban, 85058 ; 29th mile, M.V. road, 86626.

*Distrib.* : INDIA : Sikkim, Arunachal Pradesh, Meghalaya.

## AGAVACEAE

**Dracaena angustifolia** Roxb., Fl. Ind. 2 : 155. 1824 ; Hook. f., Fl. Brit. India 6 : 327. 1892 ; Balakr., Fl. Jowai 2 : 534. 1983.

Erect shrubs or small trees. Panicle with several well developed branches. Flowers white or tipped with pink or light yellow. Fruits berries, orange.

*Fl. & Fr.* : November - October.

27th mile camp, 86642.

*Distrib.* : INDIA : North - east India, Andamans ; MYANMAR, MALAYA, AUSTRALIA.

## TACCACEAE

**Tacca integrifolia** Ker - Gawler in Curtis Bot. Mag. t. 1488. 1812 ; Hook. f., Fl. Brit. India 6 : 287. 1892. *T. choudhurliana* Deb in Indian For. 90 : 141. 243. 1964.

Rhizomes oblong, curved, 3 - 8 cm thick. Scape as long as petiole ; spathes twisted, dirty green with purple nerves. Flowers greenish - purple or yellow. Fruits black, angular, hairy.

*Fl. & Fr.* : February - October.

20 km, M.V. road, 83199.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya ; BANGLA DESH, MYANMAR.

*Tacca laevis* Roxb., *Fl. Ind.* 2 : 171. 1824 ; *Hook. f.*, *Fl. Brit. India* 6 : 288. 1892 ; *Balakr.*, *Fl. Jowai* 2 : 535. 1983.

Rhizomes 1 - 2 cm thick. Scape curved, purplish - green. Flowers greenish grey, bluish, violet or chocolate coloured. Fruits oblong, turbinate, black.

*Fl. & Fr.* : Throughout the year.

Salt lick forest, Miao, 83359.

*Distrib.* : INDIA : North east India ; BANGLA DESH, MYANMAR, BHUTAN, JAVA.

### DIOSCOREACEAE

*Dioscorea alata* L., *Sp. Pl.* 1033. 1753 ; *Hook. f.*, *Fl. Brit. India* 6 : 296. 1892 ; *Rao & Verma in Bull. Bot. Surv. India* 15 : 201. 1973.

Dioecious climbers with usually solitary tubers ; stems 4 - winged unarmed or prickly. Flowers rare. Fruits capsule, reddish brown on drying ; seeds all around winged.

*Fl. & Fr.* : February - November.

10th mile, M.V. road, 87775.

*Distrib.* : INDIA : Throughout India ; cultivated for its tubers.

*Dioscorea belophylla* Voigt ex Haines, *For. Fl. Chota Nagpur* 530. 1910. *Dioscorea glabra* non Roxb. ; *Hook. f.*, *Fl. Brit. India* 6 : 294. 1892 ; *Rao & Verma in Bull. Bot. Surv. India* 15 : 19. 1973.

Climbers with solitary or more tubers ; stems terete or faintly ridged. Fruits capsule with retuse base, winged ; seeds winged all around.

*Fl. & Fr.* : September - February.

26th mile. M.V. road, 86668.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India, Maharashtra ; MYANMAR, MALAYA.

**Dioscorea pentaphylla** L., Sp. Pl. 1032. 1753 ; Hook. f., Fl. Brit. India 6 : 289. 1892 ; Balakr., Fl. Jowai 2 : 537. 1983.

Climbers ; stems up to 10 m, prickly bulbils many, globose or ellipsoid. Fruits capsule, ascending, pubescent when young, rounded at both ends, winged ; seeds winged at base only.

*Fl. & Fr.* : July - December.

Miao forest, 81142.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, THAILAND, CHINA, MALAYA.

**Dioscorea wattii** Prain & Burkill in J. Asiat. Soc. Beng. N. S. 4 : 457. 1908 ; Rao & Verma in Bull. Bot. Surv. India 15 : 201. 1973.

Climbers, with deeply buried tubers, flesh red on exposure ; stems 8 - ridged with scattered recurved prickles. Fruits capsule, apex slightly cordate ; seeds winged all around.

*Fl. & Fr.* : March - February.

Kamlat to Krosun, 88018.

*Distrib.* : INDIA : North - east India.

### STEMONACEAE

**Stemona tuberosa** Lour., Fl. Cochinch. 490. 1790 ; Hook. f., Fl. Brit. India 6 : 298. 1892 ; Balakr., Fl. Jowai 2 : 538. 1983.

Perennial erect herbs, with fasciculate roots ; stem woody below, scandent or climbing. Flowers usually 2, rarely 1 in the axil of leaves in condensed cymes, greenish with purple veins. Fruits capsule, ovoid, with 5 - 8 seeds.

*Fl. & Fr.* : March - September.

27th mile, M. V. road, 87944.

*Distrib.* : INDIA : West Bengal, North - east India ; BANGLA DESH, CHINA.

### LILIACEAE

**Disporum cantoniense** (Lour.) Merr. in Phillip. J. Sci. 15 : 229. 1919 ; Balakr., Fl. Jowai 2 : 542. 1983. *Fritillaria cantoniensis*

Lour., Fl. Cochinch. 206. 1790. *Disporum pullum* Salisb. in Trans. Hort. Soc. London 1 : 331. 1812 ; Hook. f., Fl. Brit. India 6 : 360. 1892.

Erect herbs ca 1 - 5 m high, branched at apex. Flowers in umbels, many or few flowered, white or dull purple. Fruits - berries, blue - black.

*Fl. & Fr.* : June - December.

Salt lick forest, Miao, 83548 ; Hornbill - Firmbase, 83684.

*Distrib.* : INDIA : Uttar Pradesh, Bihar, Sikkim, North east India ; NEPAL, MYANMAR, CHINA, THAILAND.

***Ophiopogon intermedius*** D. Don, Fl. Nep. 48. 1825 ; Hook. f., Fl. Brit. India 6 : 269. 1892. *O. wallichianus* (Kunth) Hook. f., Fl. Brit. India 6 : 268. 1892.

Scapigerous herbs with a very short and thick root - stock. Flowers in lax or dense flowered racemes or solitary, white or pale - lilac. Fruits black.

*Fl. & Fr.* : September - February.

Krosam - Shirong, 88088.

*Distrib.* : INDIA : Throughout India ; NEPAL, SRI LANKA, THAILAND, CHINA.

***Peliosanthes tetra*** T. Anderson subsp. *humilis* (T. Anderson) Jessop in Blumea 23 : 155. 1976 *P. humilis* T. Anderson, Bot. Repos. 10 : 1. 634. 1811. *Peliosanthes bakeri* Hook. f., Fl. Brit. India 6 : 267. 1892 ; Balakr., Fl. Jowai 2 : 540. 1983.

Herbs with horizontal rootstock. Flowers in dense flowered short racemes, green or dark purplish - green. Fruits indehiscent, sub - globose, blackish.

*Fl. & Fr.* : November - April.

Hornbill - Firmbase, 83695 ; Kumon Burn, 99694.

*Distrib.* : INDIA : Arunachal Pradesh, Meghalaya.

***Pleomele angustifolia*** (Roxb.) N.E. Brown in Kew Bull. 1914 : 277. 1914. *Dracaena angustifolia* Roxb., Fl. Ind. 2 : 155. 1832 ; Hook. f., Fl. Brit. India 6 : 327. 1892.

Shrubs ca 1.5 m high. Leaves sessile, 20 - 60 x 2 - 5 cm, linear or ensiform, recurved. Flowers white or tipped with pink, 2 - 3 rate on the branches of spreading panicles. Berries ca 2.5 cm diam., orange.



*Fl. & Fr.* : January - December.

P. Kund, 99456.

*Distrib.* : INDIA : North - east India, Andamans ; MYANMAR, BANGAL DESH, MALAYSIA, AUSTRALIA.

*Pleomele terniflora* (Roxb.) Merr. in J. Arn. Arb. 23 : 157. 1942 ; Deb, Fl. Tripura 2 : 425. 1983. *Dracaena terniflora* Roxb., Fl. Ind. 2 : 159. 1832 ; Hook. f., Fl. Brit. India 6 : 328. 1892. *Tuplstra wattii* Hook. f., Fl. Brit. India 6 : 325. 1892. *Campylandra wattii* Baker in J. Linn. Soc. 25 : 78, t. 32. 1889.

Straggling shrubs ca 1 m tall. Leaves 12 - 22 x 5 - 7 cm, elliptic - lanceolate, shortly acuminate. Flowers 2 - 3 rate, in the axils of small bracts. Berries reddish.

*Fl. & Fr.* : June - December.

*Distrib.* : INDIA : North - east and South India, BANGLA DESH, MALAYA.

### SMILACACEAE

*Smilax perfoliata* Lour., Fl. Cochinch. 622. 1790 ; Balakr., Fl. Jowai 2 : 544. 1983. *S. roxburghiana* Hook. f., Fl. Brit. India 6 : 311. 1892.

Climbing shrubs, prickly ; stem quadrangular. Flowers in solitary umbels or 2 - 3 on a common peduncles, many flowered, greenish. Fruits berries, with 1 or 2 seeds.

*Fl. & Fr.* : January - December.

Salt lick forest, Miao, 83573.

*Distrib.* : INDIA : Uttar Pradesh, Bihar, West Bengal, Sikkim, North - east India ; NEPAL, MYANMAR, CHINA.

### PONTEDERIACEAE

*Monochoria hastata* (L.) Solms in DC., Mon. Phan. 4 : 523. 1883 ; Balakr., Fl. Jowai 2 : 545. 1983. *Pontederia hastata* L., Sp. Pl. 288. 1753. *Monochoria hastaeifolia* Presl., Rel. Haenk. 2 : 128. 1835 ; Hook. f., Fl. Brit. India 6 : 362. 1892.

Fresh water or marshy herbs with creeping rhizome. Flowers in simple or subumbellate racemes, pale blue with green midrib ; filaments white. Fruits sub - globose capsule.

*Fl. & Fr.* : December - October.

Rani jheel, 83733.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, CHINA, MALAYA.

### COMMELINACEAE

***Aclisia subumbellata*** (C.B. Clarke) C.B. Clarke *Commelin.* & *Cyat.* Beng. t. 30. 1874. *Pollia subumbellata* C.B. Clarke in J. Linn. Soc. Bot. 11 : 451. 1871 ; Hook. f., Fl. Brit. India 6 : 368. 1892.

Herbs with creeping stems, rooting below at the nodes. Flowers in depressed sessile panicles, white ; bracteoles amplexicaulis, persistent.

*Fl. & Fr.* : February - October.

Miao forest, 81035.

*Distrib.* : INDIA : Sikkim, North - east India ; BHUTAN, BANGLA DESH.

***Amischotolype mollissima*** (Blume) Hassk. in Flora 392. 1863. *Campelia mollissima* Blume, Pl. 1 : 7. 1827. *Forrestia mollissima* (Blume) Kds. ex Kursion, Fl. Java 1 : 282. 1911 ; Balakr., Fl. Jowai 2 : 550. 1983. *F. mollis* Hassk. in Flora 68. 1864 ; Hook. f., Brit. India 6 : 383. 1892.

Small erect herbs, rooting in basal nodes ; sheaths tubular hairy. Flowers in sub sessile capitate cymes, white or pale violet. Capsule purplish.

*Fl. & Fr.* : February - October.

M' Pen Check gate, 81010 ; 29th mile, M.V. road, 86662.

*Distrib.* : INDIA : North - east India ; MYANMAR, MALAYA.

***Commeliana diffusa*** Burm. f., Fl. Ind. 18. t. 6. f. 2. 1768 ; Hara & William, Enum. Fl. Pl. Nepal 1 : 82. 1978. *C. nudiflora* non L. : Hook. f., Fl. Brit. India 6 : 369. 1892.

Small herbs, with creeping stems. Spathes ca 2 cm, acute or cordate, puberulous. Flowers in cymes, 1 - 3 flowered, blue or pale whitish outside.

*Fl. & Fr.* : September - December.

Miao forest, 83101.

*Distrib.* : INDIA : Throughout India ; Pantropic weed.

***Commeliana paludosa*** Blume, Enum. Pl. Java 1 : 2. 1827 ; Balakr., Fl. Jowai 2 : 548. 1983. *C. obliqua* Buch. - Ham. ex D. Don, Prodr. Fl. Nep. : 45. 1825 ; Hook. f., Fl. Brit. India 6 : 372. 1892.

var. *paludosa*.

Small creeping herb. ; sheaths ca 4 cm long. Spathes terminal, densely hairy. Flowers in racemes, white or violet.

*Fl. & Fr.* : October - May.

Miao forest, 83036 ; M' Pen Check gate, 83131.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, SRI LANKA, MALAYSIA.

*Dietyospermum scaberrimum* (Blume) J.K. Morton in J. Linn. Soc. Bot. 59, 4/6, 1966. *Commelina scaberrima* Blume, Enum. Pl. Java 1 : 4, 1827. *Aneilema scaberrimum* (Blume) Kunth, Enum. Pl. 4 : 69, 1843 ; Hook. f., Fl. Brit. India 6 : 382, 1892 ; Balakr., Fl. Jowai 2 : 551, 1983.

Erect or trailing herbs, often rooting at lower nodes. Sheaths ca 4 cm hispid. Flowers in terminal or axillary panicles. Pinkish white or bluish. Fruits sticky.

*Fl. & Fr.* : September - February.

Salt lick, Miao, 81034 ; M' Pen Check gate, 83174 ; Happy valley, 85130.

*Distrib.* : INDIA : North east India, NEPAL, BHUTAN, SRI LANKA, CHINA, MALAYSIA.

*Floscopa scandens* Lour., Fl. Cochinch, 193, 1790 ; Hook. f., Fl. Brit. India 6 : 390, 1892, Balakr., Fl. Jowai 2 : 551, 1983.

Small erect herbs, with creeping stems. Sheaths ca 2.5 cm long, glabrous or hirsute. Flowers in terminal or axillary pyramidal, panicles pinkish white or violet.

*Fl. & Fr.* : September - March.

M' Pen Check gate, 791788, 83151 ; Deban river, 85115.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, MALAYSIA, AUSTRALIA.

*Murdannia nudiflora* (L.) Brenan in Kew Bull. 1952 : 189, 1952 ; Balakr., Fl. Jowai 2 : 553, 1983. *Commelina nudiflora* L., Sp. Pl. 4, 1753, p. p. *Aneilema nudiflora* (L.) R. Br., Prodr. 271, 1810 ; Hook. f., Fl. Brit. India. 6 : 378, 1892.

Slender diffuse herbs, rooting at base. Sheaths ca 1 cm long, hairy at margins. Flowers in cymes, at the end of branches, purplish or pinkish - white.

*Fl. & Fr.* : June - December.

27th mile camp, 84965 ; Deban nala, 85105.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, CHINA, JAPAN, MALAYSIA, AFRICA.

**Murdannia terminalis** Raiz. in Indian For. 84 : 499. 1958. *Tradescantia terminalis* Blume, Enum. Pl. Java 1 : 6. 1827. *Aneilema humilontanum* Wallich ; Hook. f., Fl. Brit India 6 : 380. 1892.

Small herbs, growing in marshy places, stems creeping rooting from the nodes. Flowers in terminal panicles, purplish.

*Fl. & Fr.* : September - February.

Miao forest, 83103.

*Distrib.* : INDIA : Throughout India ; JAVA.

**Pollia hasskarlii** Rolla Rao in Notes R. Bot. Gard. Edinb. 25 : 188. 1964. *P. aclicia* Hassk. in Fl. Jungh. 148. 1852, *nom. illegit. p. p.* ; Hook. f., Fl. Brit. India 6 : 367. 1892.

Erect, stout herbs. Flowers in erect lax flowered panicles, villous, white. Fruits subglobose, small, black or bright blue.

*Fl. & Fr.* : August - February.

Miao forest, 81033 ; 10 km from Deban, 83621.

*Distrib.* : INDIA : North-east India ; NEPAL, BHUTAN, MYANMAR, CHINA, MALAYSIA.

## ARECACEAE

**Calamus erectus** Roxb., Fl. Ind. 3 : 774. 1882 ; Beccari & Hook. f., Fl. Brit. India 6 : 438. 1892 ; Balakr., Fl. Jowai 2 : 556. 1983.

*Asm.* : Jeng.

Erect tufted palms, armed with whorls of spines ; stems 2.4 cm thick ; sheaths flagelliferous with long flat spines. Leaf rachis not cirriferous ; leaflets 1 costate ; costa bristly on both surfaces. Fruits ellipsoid, yellowish - red.

*Fl. & Fr.* : January - December.

Miao forest, 81754 ; Imbeong, 87619.

*Distrib.* : INDIA : Sikkim, North - east India ; MYANMAR,

**Calamus floribundus** Griffith in Calc. J. Nat. Hist. 5 : 56. 1845. Beccari & Hook. f., Fl. Brit. India 6 : 444. 1892 ; Balakr., Fl. Jowai 2 : 556. 1983.

Asm. : *Lejai bet.*

Scandent tufted climbing palms ; stem 2 - 5 cm thick. Sheaths with dark brown *ca* 3 cm long spines. Leaflets inequidistant, in remote fascicles, costae 3 - 7, bristly. Fruits subglobose, pale brownish yellow.

*Fl. & Fr.* : February - October.

Miao forest, 81140.

*Distrib.* : INDIA : North - east India.

**Calamus gracilis** Roxb., Fl. Ind. 3 : 781. 1832 ; Beccari & Hook. f., Fl. Brit. India 6 : 453. 1892.

Slender, scandent palms ; stems thin *ca* 1 cm thick. Sheaths green - glabrous. Leaflets few in opposite groups of 3 - 5 on each side. Costae 3 - 7, more or less setose. Fruits oblong, pale.

*Fl. & Fr.* : February - December.

39th mile, M. V. road, 87669 ; Miao forest, 81140.

*Distrib.* : INDIA : North - east India.

**Calamus leptospadix** Griffith in Calc. J. Nat. Hist. 5 : 49. 1845 ; Beccari & Hook. f., Fl. Brit. India 6 : 441. 1892 ; Balakr., Fl. Jowai 2 : 556. 1983.

Scandent palms ; stem 1. 2 - 1. 8 cm. Sheaths scurfy - ferruginous, with flat solitary or aggregated spines and flattened clawed flagellum, costae 3, closely bristly. Fruits subglobose, yellowish with reddish brown patches.

*Fl. & Fr.* : March - December.

Firmbase, 83723.

*Distrib.* : INDIA : Sikkim, North - east India.

**Caryota urens** L., Sp. Pl. 1189. 1753 ; Beccari & Hook. f., Fl. Brit. India 6 : 423. 1892 ; Deb, Fl. Tripura 2 : 433. 1983.

Lofty palms, trunks *ca* 20 m high with big bi - pinnate leaves *ca* 6 m long. Spadix very large ; branches simple, very long, pendulous. Fruits reddish, with thin yellow pericarp.

*Fl. & Fr.* : April - December.

29th mile, M. V. road, 86604.

*Distrib.* : INDIA : North east and South India ; NEPAL, MYANMAR, SRI LANKA, MALAYA.

*Didymosperma nana* H. Wendl. & Drude in Kerchov, Palm. 243. 1878 ; Hook. f. in Bot. Mag. t. 6836 1885 ; Baccari, Fl. Brit. India 6 : 420. 1892. *Wallichia nana* Griffith in Calc. J. Nat. Hist. 5 : 488. 1845.

Small erect palms ; stem 1 - 2 m high ; rooting from the base. Leaflets 1 - 3 pairs opposite or alternate. Spadix erect, very stout, dense flowered. Fruits white oblong, 1 seeded.

*Fl. & Fr.* : February - December.

Krosam to Shirong, 88071.

*Distrib.* : INDIA : North east India.

*Livistona jenkinsiana* Griffith in Calc. J. Nat. Hist. 5 : 334. 1845 ; Baccari & Hook. f., Fl. Brit. India 6 : 435. 1892.

Asm. : *Toko*.

Tall palms *ca* 10 m high. Leaves *ca* 2 m long, reniform, divided into bilobed segments. Spadix *ca* 1 m long, axillary, dichotomously branched at the end of the spathes. Fruits drupes, reniform globose, alternate at the base.

*Fl. & Fr.* : February - November.

30th mile, M. V. road, 87635.

*Distrib.* : INDIA : North east India.

The leaves are used for covering the tops of palanquins and the roofs of boats, and also used for making peculiar hats and it merits for its lightness and durability.

*Phoenix rupicola* T. Anderson in J. Linn. Soc. 11 : 13. Baccari & Hook. f., Fl. Brit. India. 6 : 425. 1892.

Tall palms, *ca* 7 m high with long leaves, quite glabrous. Spadices elongated much compressed. Fruits oblong, shining yellow, with grooved seeds.

*Fl. & Fr.* : June - February.

Miao forest, 79083 ; 19th mile, M. V. road, 85164.

*Distrib.* : INDIA : Sikkim, North - east India.

***Pinanga gracilis*** (Roxb.) Blume in Rumphia 2 : 77. 1889 ; Beccari & Hook. f., Fl. Brit. India 6 : 407. 1892 ; Balakr., Fl., Jowai 2 : 557. 1983. *Areca gracilis* Roxb., Fl. Ind. 3 : 619. 1832.

Tall slender, usually gregarious palms, *ca* 6 m high. Leaves sparingly pinnate ; leaflets *ca* 0.4 m long, 2 - 3 ribbed. Spadix simple, reflexed. Male flowers in 3 - rows. Fruits *ca* 1 cm long, ovate, orange or scarlet.

*Fl. & Fr.* : January - December.

29th mile. M.V. road, 86623.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN, MYANMAR.

***Wallichia densiflora*** Mart., Nat. Palp. 3 : 190. 1838 ; Beccari & Hook. f., Fl. Brit. India 6 : 419. 1892 ; Balakr., Fl. Jowai 2 : 557. 1983.

Erect, elegant palms ; stems up to 5 m high. Leaves pinnatisect, 2 - 3 m long ; leaflets alternate or subopposite or 2 - 4 nate with brown midrib, spadices axillary, curved, often pendulous, spathes membranous tinged with dark purple. Male flowers many, yellow ; female flowers purplish. Fruits oblong, *ca* 1 cm long, dull purple.

*Fl. & Fr.* : January - December.

27th mile road, 86660.

*Distrib.* : INDIA : Kumaon to North - east India ; BANGLA DESH.

***Zalacca secunda*** Griffith in Calc. J. Nat. Hist. 5 : 12. 1845 ; Beccari & Hook. f., Fl. Brit. India 6 : 472. 1892.

Stemless, armed palms. Leaves *ca* 10 m long ; leaflets 70 - 80 cm long and 8 cm broad. Male spadix compact ; stake nearly as long as the spathe. Female spadix paniculately branched, tomentose. Flowers densely crowded ; stamens united to the petals. Fruits ovoid, with thin pericarp ; seeds subglobose, dark brown.

*Fl. & Fr.* : January - December.

Happy valley, 85134.

*Distrib.* : INDIA : Arunachal Pradesh.

## ARACEAE

**Pothos cathcartii** Schott, Aroid, 1 : 22, t. 44, 45, 1857 ; Hook. f., Fl. Brit. India 6 : 552, 1893.

Small climbing shrubs with creeping stems ; peduncles very stout, sheathed ; bracts large, concave ; spathe orbicular. Spadix strongly stipitate, ca 1 cm diam., oblong to globose. Berries oblong or obovoid, scarlet.

*Fl. & Fr.* : February - October.

27th mile, M.V. road, 87877 ; 20th mile, M.V. road, 85010.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; NEPAL, BHUTAN, MYANMAR, CHINA,

**Pothos scandens** L., Sp. Pl. 968, 1753 ; Hook. f., Fl. Brit. India 6 : 551, 1893 ; Balakr., Fl. Jowai 2 : 559, 1983.

Small climbing shrubs, with creeping stems. Peduncles small, sheathed ; bracts very small ; spathe cymbiform, cuspidate, equal to bracts ; sub globose. Berries oblong, scarlet.

*Fl. & Fr.* : July - February.

Deban forest, 84995.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MYANMAR, CHINA, MALAYA,

**Rhaphidophora grandis** Schott in Ost. Bot. Zeischer, 394, 1858 ; Balakr., Fl. Jowai 2 : 561, 1983. *R. eximia* Hook. f., Fl. Brit. India 6 : 547, 1893, p. p.

Tall climbing plants ; stems stout, 2 - 3 cm thick. Leaves dark green on both the surfaces, pinnatifid, peduncles ca 2 cm long. Spathe oblong, cuspidate, pale - yellowish - white ; spadix shorter than the spathe, white. Berries orange - yellow.

*Fl. & Fr.* : June - December.

19th mile, M.V. road, 85167.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North - east India.

**Rhaphidophora hookeri** Schott in Donpland, 45, 1857 ; Hook. f., Fl. Brit. India 6 : 546, 1892.

Lofty climbing plants, with very large leaves, green on both surfaces, membranous, entire. Spathe green, yellow within, ovoid oblong, turgid ; spadix, short, stout. Berries greenish.



*Fl. & Fr.* : September - December.

16th mile, M. V. road, 85174.

*Distrib.* : INDIA : Sikkim, North - east India.

### CYPERACEAE

**Carex baccans** Nees in Wight, Contr. Bot. Ind.122. 1834 ; C.B. Clarke in Fl. Brit. India 6 : 722. 1894 ; Balakr., Fl. Jowai 2 : 573. 1983.

Small tufted perennial herbs ; stem *ca* 1 m, erect or nodding ; bracts foliaceous. Spikelets on panicles, reddish - brown. Utricles broadly obovoid beaked, trigonous bright red. Nut ellipsoid, dark brown.

*Fl. & Fr.* : September - February.

Deban to Hornbill, 83678 ; Krosam, 88082.

*Distrib.* : INDIA : North east and South India ; SRI LANKA, CHINA, MALAYA.

**Carex cruciata** Wahlenb. in Vet. Akad. Handl. Stock. 24 : 149. 1803 ; C.B. Clarke in Fl. Brit. India 6 : 715. 1894 ; Balakr., Fl. Jowai : 572. 1983.

Tufted perennial herbs ; stems erect, trigonous ; bracts foliaceous. Spikelets numerous on panicles, reddish - brown, sub - pyramidal. Utricles ellipsoid, whitish stramineous. Nuts trigonous, apiculate, blackish brown.

*Fl. & Fr.* : April - March.

Deban forest, 85095 ; 27th mile, camp, 84962 ; Krosam to Shirong, 88062.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, JAPAN.

**Carex filicina** Nees in Wight, Contr. Bot. India 123. 1834 ; C.B. Clarke in Hook. f., Fl. Brit. India 6 : 717. 1894 ; Balakr., Fl. Jowai 2 : 572. 1983.

Perennial herbs *ca* 2 m high ; stem slender ; sheath reddish brown ; bracts foliaceous, shorter or equal the panicles. Spikelets numerous on panicles, greenish - brown or pale - reddish brown. Utricles divaricate, trigonous, ellipsoid, smooth or hispidulous, greenish. Nuts ellipsoid, brownish - black.

*Fl. & Fr.* : May - October.

M' Pen Check gate, 83160 ; 17 mile, M. V. road, 83752.

*Distrib.* : INDIA : North - east India ; NEPAL, CHINA, MALAYA.

**Carex vesiculosa** Boott, *Illus. Carex* 3 : 107. t. 323. 1862 ; C.B. Clarke in *Fl. Brit. India* 6 : 717. 1894.

Perennial herbs *ca* 1 m high ; stem trigonous ; sheaths yellowish brown. Spikelets numerous on panicles ; yellow brown, Utricles ellipsoid, villous all over. Nuts yellowish brown.

*Fl. & Fr.* : June - February.

Deban, 79157.

*Distrib.* : INDIA : Sikkim, North - east India ; NEPAL, BHUTAN, MALAYSIA.

**Cyperus brevifolius** ( Rottb. ) Hassk., *Cat. Hort. Bogor.* 24. 1844. *Kyllinga brevifolia* Rottb., *Descr. Icon.* 13. t. 4. f. 3. 1773 ; C.B. Clarke in *Fl. Brit. India* 6 : 588. 1893.

Perennial herbs ; rhizomes pinkish or purplish - black ; bracts 3 or 4 foliaceous. Spikes solitary or 2 - 3 lateral spikes, brownish at maturity ; spikelets numerous, pale green or brown. Nuts obovoid, yellowish or brown.

*Fl. & Fr.* : March - November.

30th mile, M. V. road, 79157.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYA.

**Cyperus diffusus** Vahl, *Enum. Pl.* 2 : 321. 1806 ; C.B. Clarke in *Fl. Brit. India* 6 : 603 1893 ; Balakr., *Fl. Jowai* 2 : 589. 1983.

Perennial tufted herbs ; stems stout, trigonous ; bracts foliaceous, deflexed. Spikelets in clusters, rarely solitary, sub compressed. Nut ellipsoid, blackish - brown.

*Fl. & Fr.* : June - March.

M' Pen Check gate, 83169.

*Distrib.* : INDIA : Throughout India ; NEPAL, BHUTAN, CHINA, SRI LANKA, MALAYSIA.

**Cyperus distans** L. f. var. *pseudonutans* Kueckenth. in Engler, *Pflanzenr.* 101 : 137. 1935. *C. nutans auct. non Vahl*, 1906 ; C.B. Clarke in *Fl. Brit. India* 6 : 607. 1893.

Perennial herbs up to 50 cm tall ; stem triquetrous, swollen at base. Spikelets crowded, erect at maturity. Nuts *ca* 1 mm, ellipsoid, brown.

*Fl. & Fr.* : January - April.

Gandhigram, 99696.

*Distrib.* : INDIA : Cosmopolitan.

*Cyperus exaltatus* Retz., Obs Bot. 5 : 11. 1789 ; C.B. Clarke in Fl. Brit. India 6 : 617. 1893.

Perennial tufted herbs ; rhizomes short - woody ; stems with swollen base, stout ; bract foliaceous, spikelets numerous, laxly arranged, many flowered. Nuts broadly stipitate, trigonous, apiculate.

*Fl. & Fr.* : October - March.

Firmbase, 83702.

*Distrib.* : INDIA : Throughout India ; Tropics of the world.

*Cyperus haspan* L., Sp. Pl. 45. 1753 (haspan) ; C.B. Clarke in Fl. Brit. India 6 : 600. 1893 ; Balakr., Fl. Jowai 2 : 589. 1983.

Annual or perennial tufted herbs ; stems slender or rigid compressed ; bracts foliaceous, spreading. Spikelets 3 - 6, digitate, many - flowered ; glumes ovate - oblong, yellowish - red. Nuts broadly obovoid, apiculate, yellowish.

*Fl. & Fr.* : January - December.

27th mile, M. V. road, 84973.

*Distrib.* : INDIA : Throughout India ; Warm temperate regions of the World.

*Cyperus kyllingia* Endl., Cat. Hort. Acad. Vindob. 1 : 94. 1842 ; Balakr., Fl. Jowai 2 : 585. 1983. *Kyllingia monocephala* Rottb., Descr. Icon. 13. t. 4. 1773, p. p. ; C.B. Clarke in Fl. Brit. India 6 : 588. 1893.

Perennial herbs ca 40 cm high ; stems in linear succession, compressed triquetrous ; bracts foliaceous, spreading. Spikes solitary, sub globose, greenish - white in flowers, later on brownish ; spikelets numerous, 1 - 2 flowered ; glumes red dotted all over. Nuts lenticular, blackish - brown.

*Fl. & Fr.* : June - February.

M' Pen Check gate, 83754.

*Distrib* : INDIA : Throughout India ; MYANMAR, SRI LANKA, MALAYSIA.

**Cyperus sanguinolentus** Vahl, Enum. Pl. 2 : 354. 1806 ; Balakr., Fl. Jowai 2 : 586. 1983. *Pycerus sanguinolentus* (Vahl) Nees in Linnaea 9 : 283. 1834 ; C.B. Clarke in Fl. Brit. India 6 : 590. 1893.

subsp. **sanguinolentus**

Annual or perennial herbs *ca* 90 cm high ; stems erect or decumbent at the base, compressed ; bracts foliaceous, spreading. Spikelets congested, compressed, *ca* 35 flowered ; glumes ovate, obtuse, brown. Nuts sub orbicular, black - brown.

*Fl. & Fl.* : May - February.

27th mile, M. V. road 86643.

*Distrib.* : INDIA : Throughout India ; MYANMAR, SRI LANKA, MALAYSIA.

**Eleocharis acutangula** (Roxb.) Schult. in Roem. & Schult., Syst. Mant. 2 : 91. 1824 ; Balakr., Fl. Jowai 2 : 574. 1983. *Scirpus acutangulus* Roxb., Fl. Ind. 1 : 216. 1820. *Eleocharis fistulosa* (Poiret) Link. in Sprengel, Jahrb. Gewach heft 3 : 78. 1820 ; C.B. Clarke in Fl. Brit. India 6 : 696. 1893.

Perennial herbs, 30 - 80 cm high ; stems slender or stout, concave on one side. Leaf sheaths loose, purplish. Spikelets thicker than stem, greenish, many flowered ; glumes imbricating, ovate oblong, red brown. Nuts obovoid, brownish.

*Fl. & Fr.* : June - November.

27th mile, M. V. road, 86643.

*Distrib.* : INDIA : North - east India ; NEPAL, MYANMAR, SRI LANKA, MALAYSIA.

**Fimbristylis complanata** ( Retz. ) Link, Hort. Berol. 1 : 292. 1827 ; C.B. Clarke in Fl. Brit India 6 : 646. 1893 ; Balakr., Fl. Jowai 2 : 581. 1983. *Scirpus complanda* Retz., Obs. Bot. 5 : 14. 1789.

Annual or perennial herbs, *ca* 70 cm high ; stems compressed ; bracts foliaceous, erect. Spikelets solitary, oblong - lanceolate ; glumes spiral, ovate oblong, deep brown. Nuts broadly obovoid trigonous, whitish.

*Fl. & Fr.* : June - October.

27th mile, M. V. road, 84971.

*Distrib.* : INDIA : Throughout India ; Pantropics.

**Fimbristylis dichotoma** (L.) Vahl, Enum. Pl. 2 : 287. 1806, *p.p.* ; Balakr., Fl. Jowai 2 : 580. 1983. *Scirpus dichotoma* L., Sp. Pl. 50. 1753 ; *Fimbristylis diphylla* Vahl, Enum. Pl. 2 : 289. 1806 ; C.B. Clarke in Fl. Brit. India 6 : 636. 1893.

Annual or perennial herbs, ca 1 m high, stems trigonous, compressed ; bracts foliaceous, short. Spikelets ovoid - globose ; glumes spiral, oblong ovate, chestnut brown. Nuts obovoid, apiculate, pale brown.

*Fl. & Fr.* : May - December.

27th mile, M.V. road, 84964.

*Distrib.* : INDIA Throughout India ; Tropics of the World.

**Fimbristylis schoenoides** (Retz.) Vahl, Enum. Pl. 2 : 286. 1806 ; C.B. Clarke in Fl. Brit. India 6 : 634. 1893 ; Balakr., Fl. Jowai 2 : 580. 1983. *Scirpus schoenoides* Retz., Obs. Bot. 5 : 14. 1789.

Perennial herbs, 4 - 50 cm high, rhizomes short, woody, bracts setaceous. Spikelets broadly ovoid, terete ; glumes spiral, glossy rarely red tinged. Nuts stipitate, biconvex, brownish.

*Fl. & Fr.* : July - November.

19th mile M.V. road, 85160.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, MALAYSIA, AUSTRALIA.

**Hypolytrum nemorum** (Vahl) Sprengel, Syst. 1 : 233 1825 ; Balakr., Fl. Jowai 2 : 573. 1983. *Schoenus nemorum* Vahl, Symb. Bot. 3 : 8. 1794. *Hypolytrum latifolium* L.C. Rich. in Pers. Synop. 1 : 70. 1805 ; C.B. Clarke in Fl. Brit. India 6 : 678. 1894.

Perennial herbs, 50 - 100 cm high ; rhizomes woody, purplish outside ; stems 3 angled ; bracts 2 - 4 foliaceous, spikelets solitary, obovoid - oblong, glumes membranous, spiral, brownish. Nuts ellipsoid or ellipsoid oblong, brown.

*Fl. & Fr.* : January - December.

Jairampur forest, 81178.

*Distrib.* : INDIA : Sikkim, North east India & Andamans ; MYANMAR, CHINA, MALAYSIA, AUSTRALIA.

**Scirpus juncoides** Roxb., Fl. Ind. 1 : 218. 1820 ; Balakr., Fl. Jowai 2 : 576. 1983. *S. erectus non* Poirlet 1829 : C.B. Clarke in Fl. Brit. India 6 : 656. 1893.

Annual or perennial tufted herbs, 10 - 80 cm high ; rhizome woody, short ; stems slender, terete ; bracts solitary, erect. Spikelets 2 - 4, ovoid - oblong ; glumes imbricating, brownish. Nuts plano - convex, pitted, black.

*Fl. & Fr.* : April - December.

27th mile, M. V. road, 84966.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, JAPAN, MALAYSIA.

*Scirpus ternatanus* Reinw. ex Miq., *Fl. Ind. Bot.* 3 : 307. 1856 ; Roa & Verma, *Cyperaceae N. E. India* 45, 1982. *S. chinensis* Munro in Seem, *Bot. Voy. Herald* 423, 1857 ; C.B. Clarke in *Fl. Brit. India* 6 : 662. 1893.

Perennial herbs, ca 1.5 m high ; stems trigonous ; bracts 3 - 6, foliaceous. Spikelets in clusters, oblong, many flowered ; glumes imbricating, ovate to sub orbicular, brown. Nuts broadly obovoid, plano convex, apiculate.

*Fl. & Fr.* : March - June.

Happy valley, 83788.

*Distrib.* : INDIA : Kashmir, Uttar Pradesh, Sikkim, North east India ; MYANMAR, CHINA.

*Scleria laevis* Retz., *Obs. Bot.* 4 : 13. 1786 ; Balakr., *Fl. Jowai* 2 : 578. 1983. *S. hebecarpa* Nees in Wight, *Contr. Bot. Ind.* 117. 1834 ; C.B. Clarke in *Fl. Brit. India* 6 : 689. 1894.

Perennial herbs, 70 - 120 cm tall, rhizomes creeping stem solitary, slender, triquetrous. Leaves 18 - 40, 2 × 0.3 - 0.7 cm, acute, sheathes triquetrous. Inflorescence paniculate, terminals or lateral, spikelets lanceolate ; glumes pale brown with darker margins. Nuts - subglobose, apiculate, glossy - white to blue black, polished.

*Fl. & Fr.* : June - December.

Nampong forest, 88693.

*Distrib.* : INDIA : Throughout India ; SRI LANKA, MALAYA, CHINA, JAPAN, AUSTRALIA.

*Scleria terrestris* ( L. ) Fassett in *Rhodora* 26 : 159. 1924 ; Balakr., *Fl. Jowai* 2 : 578. 1983. *Zizania terrestris* L., *Sp. Pl.* 991. 1753. *Scleria radula* Hara in *Ann. Sc. Nat. Bot.* 18 : 232. 1862 ; C.B. Clarke in *Fl. Brit. India* 6 : 691. 1894.

Perennial, erect or scrambling over bushes, *ca* 4 m high ; rhizomes woody, purplish black ; bracts foliaceous, equalling or exceeding the panicles. Spikelets solitary, unisexual purplish ; glumes ovate, ciliolate. Nuts ovoid - sub - globose apiculate, purplish - black.

*Fl. & Fr.* : February - December.

M' Pen forest, 81030.

*Distrib.* : INDIA : North - east India ; NEPAL, CHINA, JAPAN, AUSTRALIA.

### BAMBUSACEAE

*Arundinaria hookeriana* Munro in Trans. Linn. Soc. 26 : 29 1868 ; Gamble in Fl. Brit. India 7 : 383. 1896.

Perennial tall, caespitose bamboo, culms *ca* 6 m high, slender with dark bluish ring at the top of each internode ; internodes *ca* 20 cm long. Culm sheath papery, striate, 30 - 60 × 8 - 15 cm at base. Leaves pale and glabrous beneath except few white hairs round the midrib at the base. Spikelets drooping, with 2 sterile and 1 fertile glumes.

*Fl. & Fr.* : March - December.

Happy valley, 83769.

*Distrib.* : INDIA : North - east India ; NEPAL, BHUTAN.

*Bambusa tulda* Roxb., Fl. Ind. 2 : 193. 1832 ; Gamble in Fl. Brit. India 7 : 387. 1896 ; Bor, Fl. Assam 5 : 27. 1940.

*Asm.* : *Bijli. Nal.*

Perennial evergreen or deciduous, gregarious bamboo ; culms *ca* 6 to 25 m high, grey green, sometimes streaked with yellow ; internodes 30 - 60 cm long. Culms sheath smooth or covered with brown hairs, 15 - 20 × 15 - 22 cm, rounded or triangularly truncate at top. Leaves rounded at base into a short hairy petiole. Spikelets long, many with 1 - 2 short bracts, then 2 - 4 empty glumes followed by 4 - 6 fertile glumes.

*Fl. & Fr.* : Vegetative.

27th mile, on the South bank of Noa Dihing river, 85006.

*Distrib.* : INDIA : Orissa, West Bengal, North east India ; MYANMAR.

*Cephalostachyum fuchsianum* Gamble, Bamb. Brit. India 107. t. 194. 1896. & in Fl. Brit. India 7 : 413. 1896 ; Bor, Fl. Assam 5 : 18. 1940.

Medium sized, arborescent, Sub scandent bamboo : culms small, thin walled, pale, vertically branched from the nodes. Culm sheaths thin, rounded at the top on each side into a deep concave bristly sinus. Leaves large, angled or rounded at the base with black petioled. Spikelets elongate. Palea rather longer than flowering glumes.

*Fl. & Fr.* : Vegetative.

Kumon Bum, 81353.

*Distrib.* : INDIA : Arunachal Pradesh ; BHUTAN.

**Cephalostachyum pallidum** Munro in Trans. Linn. Soc. 26 : 139. 1868 ; Gamble in Fl. Brit. India 7 : 412. 1896 ; Bor, Fl. Assam 5 : 17. 1940.

Shrubby or small arboreous bamboo, with whorled branched at the nodes ; culms 3 - 10 m, greenish - yellow ; culm sheaths thin papery, truncate at top. Leaves pale green, unequally rounded at base, setaceous at apex. Spikelets elongate, glabrous ; palea longer than fertile glumes.

*Fl. & Fr.* : Vegetative.

Kumon Bum, 78773.

*Distrib.* : INDIA : Arunachal Pradesh, Manipur, Meghalaya.

**Chimonobambusa griffithiana** (Munro) Nakai in J. Arn. Arb. 6 : 151. 1925 ; Bor, Fl. Assam 5 : 45. 1940. *Arundinaria griffithiana* Munro in Trans. Linn. Soc. 26 : 30. 1868 ; Gamble in Fl. Brit. India 7 : 379. 1896.

Erect, gregarious, thorny shrubs ; culms 3 - 10 m high, olive green ; nodes with circle of conical stout short spines ; internodes 15 - 25 cm long ; culms sheath papery, longer than the internodes, broad at base, attenuate upwards. Leaves linear - lanceolate, narrowed at base. Spikelets narrow with 2 empty glumes and 4 - 6 flowers.

*Fl. & Fr.* : February - December.

Kumon Bum, 78777.

*Distrib.* : INDIA : Arunachal Pradesh, Nagaland, Meghalaya ; BHUTAN.

**Dendocalamus hamiltonii** Nees & Arn. ex Munro in Trans. Linn. Soc. 26 : 151. 1868 ; Gamble in Fl. Brit. India 7 : 405. 1896 ; Bor, Fl. Assam 5 : 9. 1940.

*Asm.* : *Kako*.



Large tufted bamboo with caespitose culms ; culms 12 - 20 m high, much branched above, dull green at maturity ; nodes mark with root scars ; internodes 30 - 50 cm ; culm sheath long and stiff, with patches of brown hairs. Leaves variable, rounded at base, acuminate at apex. Spikelets purple, oval, depressed, glabrous, palea as long as flowering glumes.

*Fl. & Fr.* : Vegetative.

Deban, 79113.

*Distrib.* : INDIA : Uttar Pradesh, Sikkim, North east India ; BANGLA DESH, MYANMAR, THAILAND.

**Dendrocalamus hookeri** Munro in Trans. Linn. Soc. 26 : 151. 1868 ; Gamble in Fl. Brit. India 7 : 405. 1896 ; Bor, Fl. Assam 5 : 8. 1940.

Large tufted bamboo with caespitose stem ; culms 17 - 20 m high much branched, dark - green, internodes 40 - 50 cm long, culm sheath broad at base, densely covered with black or brown hairs outside, glabrous inside. Leaves rounded at base, acuminate at apex. Spikelets ovate, minutely pubescent, narrowly acute.

*Fl. & Fr.* : Vegetative.

Kumon Bum, 81392.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR.

**Pseudostachyum polymorphum** Munro in Trans. Linn. Soc. 26. 142. 1868 ; Gamble in Fl. Brit. India 7 : 409. 1896 ; Bor, Fl. Assam 5 : 13. 1940.

Asm. Bojal.

Large shrubby or semi - arborescent bamboo, with culms arising singly from creeping rhizome ; culms up to 17 m ; internodes 20 - 25 cm ; culm sheath triangular - truncate, shorter than internodes, dark brown hairy outside. Leaves oblong - lanceolate, unequal at base, attenuate and twisted at apex. Spikelets small with 1 fertile flower ; palea thin, much convolute, 2 - keeled.

*Fl. & Fr.* : Vegetative.

24th mile, M. V. road, 86687.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR.

## POACEAE

*Arundinella nepalensis* Trin., Gram. Panic. 62. 1826 ; Bor, Fl. Assam 5 : 183. 1940. *A. brasiliensis non* Raddi, 1823 : Hook. f., Fl. Brit. India 7 : 73. 1896.

Perennial grass ; culms stout, erect, up to 1 m high with woody and hard root stock. Leaves lanceolate, glabrous or villous with long soft tubercled hairs. Panicles 10 - 45 cm long, pedicels, shorter than spikelets or equal. Palea narrow-lanceolate, equal to lemma, ciliate ; stamens 3, anthers purple.

*Fl. & Fr.* : July - December.

Deban, 84996.

*Distrib.* : INDIA ; Throughout hilly parts of India ; NEPAL, MYANMAR, SRI LANKA, CHINA, AUSTRALIA, AFRICA.

*Arundinella setosa* Trin., Gram. Panic. 63. 1826. *A. mutica* Nees ex Steud., Syn. Fl. Glum. 1 : 116. 1854 ; Bor, Fl. Assam 5 : 184. 1940. *A. capillaris* Hook. f., Fl. Brit. India 7 : 74. 1896.

var. *setosa*.

Perennial grass ; culms, slender, clothed with woolly bases of the leaf sheaths ; nodes glabrous. Leaves linear acuminate, glabrous or hairy. Spikelets ca 0.5 cm long ; pedicels with stout bristles. Palea oblong lanceolate, acute ; awn ca 0.5 cm long, caducous.

*Fl. & Fr.* : July - December.

Burma nala, 79133.

*Distrib.* : INDIA ; Arunachal Pradesh ; South - east ASIA.

*Arundo donax* L., Sp. Pl. 81. 1753 ; Hook. f., Fl. Brit. India 7 : 302. 1896 ; Bor, Fl. Assam 5 : 89. 1940.

Tall stout perennial grass ; culms 2 - 6 m high, simple or branched. Leaves linear lanceolate, aristate, drooping. Inflorescence large, terminal, decomposed, plumose panicle. Spikelets 2 - 7 flowered, laterally compressed, brown. Palea about half the length of lemma ; lemma aristate at apex.

*Fl. & Fr.* : August - December.

Miao forest, 83127.

*Distrib.* : INDIA ; Throughout India ; NEPAL, MYANMAR, EUROPE, AFRICA.

**Coix gigantea** Roxb., Fl. Ind. 3 : 570. 1832; Bor, Fl. Assam 5 : 454. 1940. *C. lacrymajobi* L. var. *gigantea* (Roxb.) Stapf ex Hook. f., Fl. Brit. India 7 : 100. 1896.

Tall erect perennial grass up to 2.5 m high. Leaves linear lanceolate, obtuse or sub - cordate at base, acuminate. Flowers on false spikes or racemes, drooping. Spikelets ovate 0.5 - 0.7 cm broad ; lower glumes of male flowers broadly winged. Fruits whitish or bluish - grey, polished.

*Fl. & Fr.* : August - January.

27 th mile, M. V. road, 84982.

*Distrib.* : INDIA : North-east India ; MALAYA, AFGHANISTAN.

**Coix lacrymajobi** L., Sp. Pl. 972. 1753; Hook. f., Fl. Brit. India 7 : 100. 1896 ; Bor, Fl. Assam 5 : 453. 1940.

Annual grass; culms 1 - 2 m high, rooting at lower nodes. Leaves flat, cordate at base, acuminate. Spikelets 0.2 - 0.3 cm broad ; lower glumes of male spikelets narrowly or hardly winged. Caryopsis ovoid or globose. yellowish - white, polished.

*Fl. & Fr.* : May - December.

Firmbase, 83701 ; Nampong forest, 88752.

*Distrib.* : INDIA : Throughout India ; Tropics of ASIA, AFRICA, AMERICA.

**Cyrtococcum oxyphyllum** (Steud.) Stapf in Hook., Icon. Pl. Ser. 5 : t. 3096. 1922 ; Bor, Fl. Assam 5 : 239. 1940. *Panicum oxyphyllum* Steud., Syn. Pl. Glum. 1 : 65. 1854. *P. pilipes* Buse in Miq., Pl. Jungh. 3 : 276. 1854 ; Hook. f. Fl. Brit. India 7 : 57. 1896.

Perennial rambling grass ; culms 15 - 45 cm, rooting at the base. Leaves oblong - lanceolate, acuminate ; leaf sheaths shorter than internodes, glabrous or with ciliate margins. Panicles short lax, branched. Spikelets gibbous, laterally compressed, upper glumes, obtuse, pubescent, yellowish - white.

*Fl. & Fr.* : July - March.

18 th mile Deban, 83607 ; Deban forest, 83750.

*Distrib.* : INDIA : Hilly regions of India ; MYANMAR, MALAYA, AUSTRALIA.

**Echinochloa crusgalli** (L.) P. Beauv., Ess. Agrost. 53. 161. 1812. ; Balakt., Fl. Jowai 2 : 616. 1983. *Panicum crusgalli* L., Sp. Pl. 56.

1753 ; Hook. f., Fl. Brit. India 7 : 30. 1896. *Echinochloa cruspavonis auct non* (H.B.K) Schult. 1824 : Bor, Fl. Assam 5 : 248. 1940.

var. *brevisetata* (Doell) Neir., Fi. Neid. Ost. 31. 1859.

Annual grass ; culms ca 2 m high. Leaves linear to lanceolate, tapering to fine point at apex. Panicles erect, dense, sub opposite. Spikelets in compact clusters ; glumes membranous ; lemma with aristate cuspidate tips.

*Fl. & Fr.* : July - December.

Deban, 79113.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, MALAYA, SRI LANKA.

*Eragrostis unioides* (Retz.) Steud., Syn. Pl. Glum. 1 : 264. 1854: Bor, Fl. Assam 5 : 99. 1940. *Poa unioides* Retz., Obs. Bot. 5 : 19. 1789. *Eragrostis amabilis* Stapf in Fl. Brit. India 7 : 317. 1896.

Annual grass ; culms lax tufted or solitary, 15 - 45 cm, 2 - 3 noded. Leaves basal, tapering into a fine point. Panicles lanceolate, ovate or oblong. Spikelets compressed, many flowered ; palea as long as lemma; keels narrowly winged.

*Fl. & Fr.* : July - December.

M' Pen check gate, 83171 ; 27th mile, M. V. road, 85061 & 84970.

*Distrib.* : INDIA : Throughout India ; NEPAL, CHINA, MALAYA, AFRICA.

*Erianthus longisetosus* T. Anderson in Oefers. K. Vet. Akad. Forh. Stockh. 163. 1855 ; Hook. f., Fl. Brit. India 7 : 124. 1896 ; Bor, Fl. Assam 5 : 324. 1940.

Perennial grass ; culms 2 - 2.5 m high, stout with woody rhizome. Leaves lanceolate, tapering to a fine point. Panicles solitary or binate, erect or drooping, racemes reddish or golden brown hairy. Spikelets with long hairs ; Palea small, truncate.

*Fl. & Fr.* : October - April.

Happy valley, 83770.

*Distrib.* : INDIA : North - east India ; NEPAL, MYANMAR.

*Garnotia acutigluma* (Steud.) Ohwi, in Bot. Mag. Tokyo 55 : 393. 1941 ; Balakr., Fl. Jowai 2 : 604. 1983. *Urache acutigluma* Steud, Syn. Pl.

Glum. 121. 1854. *Garnouia stricta* Brongn. in Duperr. Voy. Coq. Bot. 133. t. 21. 1831 ; Hook. f., Fl. Brit. India 7 : 243. 1896.

Annual or perennial grass ; culms up to 1m high, nodes often bearded. Leaves linear - lanceolate ; sheaths hirsute at margins. Panicles flexuous ; pedicels scabrid. Rachilla with a tuft of hairs at apex ; palea equal to lemma.

*Fl. & Fr.* : June - December.

Deban, 85064.

*Distrib.* : INDIA : Throughout India ; MYANMAR, MALAYA.

*Imperata cylindrica* (L.) P. Beauv., Nom. Bot. ed. 3 : 10, 2. 1791. *Lagurus cylindrica* L., Syst. Nat. ed. 10 : 878. 1759. *Imperata arundinacea* Cyr., Pl. Rar. Neap. 2 : 26. 1792 ; Hook. f., Fl. Brit. India 7 : 106. 1896.

var. *major* (Nees) Hubb ex Hubb. & Vaughan, Grass. Maur. 96. 1940.

Perennial grass, with creeping rootstock ; culms solid, 20 - 200 cm, nodes densely hairy. Leaves linear lanceolate, acuminate. Panicles spiciform, pedicels swollen at tips, covered with long white hairs. Spikelets lanceolate.

*Fl. & Fr.* : March - October.

20th mile, M.V. road, 85016.

*Distrib.* : INDIA : Throughout India ; NEPAL, SRI LANKA, AUSTRALIA, AFRICA.

*Isachne albens* Trans., Sp. Gram. 1 : t. 85. 1826 ; Hook. f., Fl. Brit. India 7 : 22. 1896 ; Bor, Fl. Assam 5 : 196. 1940.

Perennial tall grass ; culms erect, 30 - 130 cm. Leaves linear lanceolate, toothed ; panicles decomposed, with capillary branches and pedicels. Spikelets globose, small ; palea shorter than lemma.

*Fl. & Fr.* : July - December.

27 th - 30 th mile, M. V. road, 84968.

*Distrib.* : INDIA : Uttar Pradesh, North - east India ; NEPAL, MYANMAR, MALAYSIA, AFRICA.

*Lophatherum gracile* Brongn., in Dupeer. Voy. C. Bot. 50. t. 8. 1831 ; Hook. f., Fl. Brit. India 7 : 331. 1896 ; Bor, Fl. Assam 5 : 60. 1940.

Perennial, loosely tufted grass with fleshy roots ; culms erect, 50 -150 cm. Leaves lanceolate, abruptly narrowed slender petiole like base, acuminate. Panicles lax, with few or cluster of branches. Spikelets acute, green ; palea glabrous, 2 - keeled.

*Fl. & Fr.* : June - December.

27th - 30th mile, M. V. road, 84968.

*Distrib.* : INDIA : Sikkim, North east India ; MYANMAR, CHINA, SRI LANKA, JAPAN, MALAYA.

*Microstegium ciliatum* (Trin.) A. Camus in Ann. Soc. Linn. Lyon, n.s. 68, 201. 1921 ; Bor, Fl. Assam 5 : 330. 1940. *Pollinia ciliata* Trin. in Mem. Acad. Sci. Petersb. ser. 6 (2) : 306. 1832 ; Hook. f., Fl. Brit. India 7 : 116. 1896.

Annual or perennial grass ; culms 60 - 120 cm high. Leaves linear - lanceolate, narrowed at base, acuminate. Panicles of 2 - 10 false spikes, flexuous, pale - green. Spikelets linear - oblong, pale ; palea small or absent.

*Fl. & Fr.* : July - December.

Happy valley, 85132.

*Distrib.* : INDIA : Throughout hilly parts of India ; MYANMAR, SRI LANKA.

*Neyraudia reynaudiana* (Kunth) King & Hitchc. in Amer. J. Bot. 21 : 131. 1934 ; Bor, Fl. Assam 5 : 115. 1940. *Arundo reynaudiana* Kunth, Rev. Gram. 1 : 275. t. 49. 1830. *N. madagascariensis* Hook. f. var. *zollingeri* Hook. f., Fl. Brit. India 7 : 305. 1896.

Perennial, reed - like grass ; culms erect, up to 4 m high. Leaves linear - lanceolate, with woolly sheath ; panicles large, drooping, silvery, olive grey. Spikelets 4 - 8 flowered ; palea toothed ; keels minutely ciliate.

*Fl. & Fr.* : June - December.

29th mile, M.V. road, 86634 ; Shirong to Hunung, 88217.

*Distrib.* : INDIA : North east India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

*Oplismenus compositus* (L.) P. Beauv. Ess. Agrost. 54 : 168. 1812 ; Hook. f., Fl. Brit. India 7 : 66. 1896 ; Bor, Fl. Assam 5 : 262. 1940. *Panicum compositum* L., Sp. Pl. 57. 1753.

Perennial grass ; culms up to 1 m high, rooting at lower nodes. Leaves linear - lanceolate, constricted at base, acuminate, hairy. Panicles consisting of a series of secund racemes, hairy all over. Spikelets lanceolate, greenish, with purple red tinged ; palea either absent or very small.

*Fl. & Fr.* : October - March.

10th mile, Deban, 83633.

*Distrib.* : INDIA : Throughout India ; Tropics of the World.

***Paspalum conjugatum*** Berg. in Act. Helv. Phys. Math. 7 : 129. t. 8, 1772 ; Hook. f., Fl. Brit. India 7 : 11. 1896 ; Bor. Fl. Assam 5 : 255. 1940.

Annual or perennial grass ; culms 20 - 60 cm, creeping. Leaves linear lanceolate, acute or acuminate. Panicles of 2 - 3 false spikes, spreading. Spikelets 2 - seriate, imbricate, pale greenish yellow ; palea equal to lemma.

*Fl. & Fr.* : July - December.

27th mile, M. V. road, 84972.

*Distrib.* : INDIA : North - east India ; AFRICA, Tropics of old World, AMERICA.

***Phragmites karka*** (Retz.) Stued., Now. Bot. ed. 2. 2 : 324. 1841 ; Hook. f., Fl. Brit. India 7 : 304. 1896 ; Bor., Fl. Assam 5 : 88 - 1940. *Arundo karka* Retz., Obs. Bot. 4 : 21 - 1786.

Perennial grass ; culms up to 7 m high, hollow. Leaves distichous, linear to broadly lanceolate, subulate. Panicles silky hairy at base, branches filiform. Spikelets many flowered ; palea much shorter than lemma.

*Fl. & Fr.* : July - December.

41st mile, M.V. road, 87699.

*Distrib.* : INDIA : Throughout India ; NEPAL, SRI LANKA, South - east ASIA, AUSTRALIA.

***Pogonatherum crinitum*** (Thunb.) Kunth, Enum. Pl. 1 : 478. 1833 ; Hook. f., Fl. Brit. India 7 : 141. 1896 ; Bor, Fl. Assam 5 : 348. 1940. *Andropogon orinitum* Thunb., Fl. Jap. 40. t. 7. 1784.

Perennial tufted grass ; culms 10 - 30 cm, nodes short pilose. Leaves linear - lanceolate, fimbriate at mouth. Racemes 2 - 3 cm. Spikelets ca 0.2 cm long ; callus hairs long ; palea longer than lemma ; lower floret male with 1 stamen, upper bisexual.

*Fl. & Fr.* : February - October.

17th mile, M. V. road, 83751.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, CHINA, JAPAN, MALAYSIA.

*Pogonatherum panicum* (Lam.) Hack. in Allg. Bot. Zeits 12 : 178. 1906 ; Bor, Fl. Assam 5 : 347. 1940. *Saccharum panicum* Lam., Encycl. Meth. Bot. 1 : 595. 1785. *Pogonatherum saccharoideum* P. Beauv., Esa. Agrost. 176. 1812 ; Hook. f., Fl. Brit. India 7 : 141. 1896.

Perennial, caespitose grass ; culms tufted, 10 - 50 cm high ; nodes glabrous. Leaves linear lanceolate, acuminate ; racemes 1 - 3 cm. Spikelets ca 0.3 cm ; callus hairs short ; palea linear - oblong or absent ; lower male florets with 2 stamens ; upper floret bisexual.

*Fl. & Fr.* : May - February.

19th mile, M. V. road, 79074.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, SRI LANKA, CHINA, THAILAND, MALAYSIA.

*Sacciolepis myosuroides* (R. Br.) A. Camus in Lecomte, Fl. Gen. Indo China 7 : 460. 1922 ; Bor, Fl. Assam 5 : 217. 1940. *Panicum myosuroides* R. Br., Prodr. 189. 1810 ; Hook. f., Fl. Brit. India 7 : 42. 1896.

Herbs with creeping rhizomes ; culms 40 - 60 cm high, slender glabrous. Leaves 10 - 23 × 0.2 - 0.6 cm, linear, acuminate. Panicle 10 - 20 cm long, narrow, cylindric. Spikelets 1.5 mm long in small fascicles, longer than the pedicels ; palea small hyaline ; lemma ovate - oblong, acute.

*Fl. & Fr.* : July - December.

Firmbase, 83714.

*Distrib.* : INDIA : Throughout hilly places in India ; Tropical ASIA & AUSTRALIA.

*Setaria pallidifusca* (Schum.) Stapf & Hubb. in Kew Bull. 1930 : 259. 1930 ; Bor, Fl. Assam 5 : 291. 1940. *Panicum pallide-fuscum* Schum., Beskr. Guin. Pl. 58. 1827.

Annual grass ; culms tufted, 30 - 60 cm high. Leaves linear, tapering to a fine point. Spikes dense, erect, purplish. Spikelets ca 0.2 cm long, bristly ; palea equal or slightly longer than lemma.

*Fl. & Fr.* : October - March.

Firmbase, 83709.



*Distrib.* : INDIA : Throughout India : Tropics of old World.

**Setaria palmifolia** (Koenig) Stapf in J. Linn. Soc. Bot. 42 : 186. 1914 ; Bor, Fl. Assam 5 : 284. 1940. *Panicum palmifolium* Koenig in Natur. f. 23 : 208. 1788. *P. plicatum non* Lam. 1791 : Hook. f., Fl. Brit. India 7 : 55. 1896.

Perennial grass ; culms 50 - 200 cm high, 4 - 9 noded. Leaves linear lanceolate, finely acuminate, hairy. Panicles 30 - 60 cm long, nodding. Spikelets ovoid, ca 0.3 cm ; palea very small or absent.

*Fl. & Fr.* : October - March.

Salt lick forest, Miao 83799.

*Distrib.* : INDIA : Throughout India ; Tropics of old and new World.

**Themeda villosa** (Poiret) A. Camus in La Comte, Fl. Indoch. 7: 364. 1922 ; Bor, Fl. Assam 5 : 409. 1940. *Anthistiria villosa* Poiret in Lam, Encycl. Meth. Bot. Suppl. 1 : 396. 1814. *A. gigantea* Cav. subsp. *villosa* (Poiret) Hack. in DC., Monogr. Phan. 6 : 674. 1889 ; Hook. f., Fl. Brit. India 7 : 217. 1896.

Perennial grass ; culms tufted up to 2 m high. Leaves linear lanceolate, tapering to narrow base, acuminate. Panicles decomposed, villous. Involucral spikelets 4, sparsely hairy. Palea narrow ciliate.

*Fl. & Fr.* : September - January.

22nd mile, M. V. road, 83504.

*Distrib.* : INDIA : North-east India ; NEPAL, CHINA, MALAYA.

**Thysanolaena maxima** (Roxb.) O. Ktze., Rev. Gen. Pl. 2 : 794. 1891 ; Bor, Fl. Assam 5 : 176. 1940. *Agrostis maxima* Roxb., Fl. Ind. 1 : 319. 1820. *Thysanolaena agrostis* Nees in Edinb. New Phil. J. 18 : 180. 1835 ; Hook. f., Fl. Brit. India 7 : 61. 1896.

Asm. *Kuehi phul*.

Perennial grass ; culms 1.5 - 3.5 m high. Leaves lanceolate, coriaceous, subamplexicaul, acuminate. Panicles 30 - 60 cm, with filiform branches. Spikelets ovate, lanceolate, acuminate, 2 flowered ; palea short.

*Fl. & Fr.* : September - March.

M' Pen Check gate, 83168 ; P. Kund, 96362.

*Distrib.* : INDIA : Throughout India ; NEPAL, MYANMAR, CHINA, MALAYSIA.

## ETHNOBOTANICALLY IMPORTANT PLANTS USED BY DIFFERENT TRIBALS

### INHABITING IN NAMDAPHA PROPOSED BIOSPHERE RESERVE

The proposed biosphere area is ethnobotanically a very diverse terrain. Tribals of various ethnic groups dominate the wooded habitats of the hilly region, where they mainly practise "jhum" cultivation. Land holdings are small and subsistence agriculture prevails ; the natives still gather many wild food plants from natural sites and used as edible types ; tubers, rhizomes, shoots and berries, etc. are eaten raw or boiled or even cooked as vegetables. Similarly, the ripe fruits of many wild plants which are pulpy and sweet are either eaten raw or pickled and used as vegetable. Sometimes, the roasted seeds are also eaten. It is imperative to say that certain tribes i.e 'Lisus' of Gandhigram and its vicinity are still far off from the main stream of the country and are mainly dependent on the wild plants for their survival. Emphasis is laid on urgency for exploration of the field resources because with the advancing civilization, the tribal pockets in the country are fast dwindling. Here I would like to quote Linneaus :

"Man ever desirous of knowledge, has already explored many things, but more and more greater still remains concealed ; perhaps reserved for the distant generations, who shall prosecute the examination of their creator's work and make necessary discoveries for the pleasure and convenience of life."

The list of few such species is appended here:

<u>BOTANICAL NAMES</u>	<u>PLANT PARTS USED</u>
<i>Abroma augusta</i> L. f. (Sterculiaceae)	Bark used for fibres
<i>Achyranthes aspera</i> L. (Amaranthaceae)	Leaves as vegetable & seeds cereal
<i>A. bidentata</i> Blume (Amaranthaceae)	Leaves as vegetable & seeds as cereal
<i>Aconitum lethale</i> Griffith (Ranunculaceae)	Rhizome used for arrow poisoning
<i>Actephila excelsa</i> Mull. - Arg. (Euphorbiaceae)	Beverage
<i>Aesculus asamica</i> Griffith (Hippocastanaceae)	Leaves for fish poisoning
<i>Agapetes variegata</i> D. Don (Vacciniaceae)	Flowers as vegetables

<i>Albizia julibrissin</i> (Willd.) Durazz. (Mimosaceae)	Dried leaves as substitute for tea
<i>Albizia procera</i> (Roxb.) Benth. (Mimosaceae)	Leaves & Barks as food
<i>Alpinia malaccensis</i> (Burm. f.) Rose (Zingiberaceae)	Rhizome & Fruits eaten
<i>Alternanthera sessilis</i> (L.) R. Br. (Amaranthaceae)	Leaves as salad
<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Leaves & tender shoots as vegetable
<i>Amomum aromaticum</i> Roxb. (Zingiberaceae)	Seeds as condiment
<i>A. dealbatum</i> Roxb. (Zingiberaceae)	Seeds as condiment
<i>Antidesma acuminatum</i> Wight (Euphorbiaceae)	Foods consumed raw
<i>A. bunius</i> (L.) Sprengel (Euphorbiaceae)	Leaves & fruits cooked with rice
<i>Aquilaria malaccensis</i> Lam. (Thymeleaceae)	Fungal infected stem forms the source of agar
<i>Ardisia crispa</i> (Thunb.) DC. (Myrsinaceae)	Leaves as vegetables and roasted fruits
<i>A. humilis</i> Vahl (Myrsinaceae)	Leaves & young shoots as vegetable
<i>Argyreia nervosa</i> (Burm. f.) Bojer (Convolvulaceae)	Young shoots as vegetables
<i>Artocarpus chama</i> Buch. - Ham. (Moraceae)	Fruits as vegetable & Pickled
<i>A. elastica</i> Roxb. ex Hornem. (Moraceae)	Leaves as salad
<i>Artocarpus heterophyllus</i> Lam. (Moraceae)	Fruits used as vegetables and pickle
<i>Arundo donax</i> L. (Poaceae)	Young shoots as vegetable but bitter in taste
<i>Arundinaria hookeriana</i> Munro (Bambusaceae)	Roasted seeds eaten
<i>Bambusa tulda</i> Roxb. (Bambusaceae)	Young shoots are eaten as vegetables

<i>Begonia barbata</i> Wallich (Begoniaceae)	Leaves & stems as vegetable
<i>Beilschmeidia roxburghiana</i> Nees (Lauraceae)	Fruits very sweet in taste
<i>Bidens pillosa</i> L. (Asteraceae)	Leaves & young shoots as vegetable & also mixed with tea
<i>Borreria articularis</i> (L. f.) Will. (Rubiaceae)	Leaves as vegetable
<i>Brassica rapa</i> L. (Brassicaceae)	Leaves & flowers ; seeds source of oil.
<i>Calamus erecto</i> Roxb (Arecaceae)	Young shoots are eaten as vegetables, & fruits are also eaten. Stem used for baskets making.
<i>C. floribundus</i> Griffith (Arecaceae)	Young shoots are eaten as vegetables & ripe fruits are also eaten. Stem used for furniture
<i>C. leptospadix</i> Griffith (Arecaceae)	Young shoot as vegetable. The different species of <i>Calamus</i> are also used for suspension bridges
<i>Callicarpa arborea</i> Roxb. (Verbenaceae)	Bark chewed with pan
<i>C. rubella</i> Lindley (Verbenaceae)	Root & bark chewed as pan
<i>Capparis acutifolia</i> Sw. (Capparaceae)	Leaves as vegetable
<i>Cardamine hirsuta</i> L. (Brassicaceae)	Leaves & young shoots as vegetable
<i>Cayratia trifolia</i> (L.) Domin (Vitaceae)	Leaves as vegetable
<i>Caryota urens</i> L. (Arecaceae)	Young shoots are eaten as vegetables
<i>Castanopsis indica</i> (Roxb.) A. DC. (Fagaceae)	Roasted seeds eaten
<i>Castanopsis tribuloides</i> A. DC. (Fagaceae)	Roasted seeds eaten
<i>Centella asiatica</i> (L.) Urban. (Apiaceae)	Whole plants as vegetable
<i>Chloranthus elatior</i> R. Br. ex Link (Chloranthaceae)	Leaves as vegetable

<i>Clerodendrum colebrookianum</i> Walp. (Verbenaceae)	Leaves as vegetable
<i>C. serratum</i> (L.) Sprengel (Verbenaceae)	Young leaves and flowers as vegetable
<i>Cinnamomum tamala</i> (Buch. - Ham.) Nees & Eberm. (Lauraceae)	Leaves and barks used as spice
<i>Cissus assamica</i> (Lawson) Craib (Vitaceae)	Fruits mesocarp sweet and eaten
<i>Citrus medica</i> L. (Rutaceae)	Fruits as confectionery
<i>Coffea bengalensis</i> Roxb. ex Roem. & Schult.  (Rubiaceae)	Seeds used as a substitute of coffee
<i>C. khasiana</i> Hook. f. (Rubiaceae)	Seeds as coffee substitute
<i>Coix. lacrymajobi</i> L. (Poaceae)	Seeds as cereal & roasted
<i>Commeliana diffusa</i> Burm. f. (Commelinaceae)	Fruits eaten raw as well as roasted
<i>Cordia myxa</i> L. (Boraginaceae)	Fruits pickled
<i>Costus speciosus</i> (Koeing) Smith (Zingiberaceae)	Rhizome & tender shoots as vegetable
<i>Curcuma aromatica</i> Salish. (Zingiberaceae)	Rhizome as condiment
<i>Cyathula prostrata</i> (L.) Blume (Amaranthaceae)	Plants as substitute for salt
<i>Cyperus haspan</i> L. (Cyperaceae)	Plants ash as a substitute for salt
<i>Cyperus diffusus</i> Vahl (Cyperaceae)	Roots edible - raw
<i>Debregeasia longifolia</i> (Burm. f.) Wedd. (Urticaceae)	Roasted fruits eaten
<i>Deeringia amaranthoides</i> (Lam.) Merr. (Amaranthaceae)	Leaves as vegetable

<i>Dendrocalamus hamiltonii</i> Nees & Arn. ex Murno (Bambusaceae)	Young shoots are eaten as vegetables
<i>Desmos dumosus</i> (Roxb.) Safford (Annonaceae)	Stem as heverage
<i>Dillenia indica</i> L. (Dilleniaceae)	Leaves & fruits are eaten as vegetable
<i>D. pentagyna</i> Roxb. (Dilleniaceae)	Flower buds & fruits are eaten as chatani and also cooked with pulses
<i>Dioscorea alata</i> L. (Dioscoreaceae)	Roasted tubers and fruits eaten
<i>D. glabra</i> (non) Roxb. (Dioscoreaceae)	Tubers & bulbs eaten
<i>D. pentaphylla</i> L. (Dioscoreaceae)	Tubers eaten after boiled with water
<i>Dracaena angustifolia</i> Roxb. (Liliaceae)	Leaves as vegetable
<i>Dryptes assamica</i> (Hook. f.) Pax & Holtum (Euphorbiaceae)	Roasted fruits eaten
<i>Echinochloa crusgalli</i> (L.) P. Beauv. (Poaceae)	Young shoots & seeds as vegetable & puddings
<i>Elaeagnus umbellata</i> non Thunb. (Elaeagnaceae)	Fruits pickled
<i>Eleocharis sphaericus</i> (Gaertn.) K. Schum. (Flacocarpaceae)	Fruits pickled
<i>Embelia subcoriacea</i> (C.B. Clarke) Mez. (Myrsinaceae)	Leaves as vegetables
<i>Emilia sonchifolia</i> (L.) DC. & Wight (Asteraceae)	Leaves as salad
<i>Entada pursaetha</i> subsp. <i>sinohimalensis</i> Crisson & Long (Mimosaceae)	Young leaves as vegetable ; old seeds as coffee ; young beans poisonous
<i>Eriobotrya bengalensis</i> (Roxb.) Hook. f. (Rosaceae)	Ripe fruits sweet, edible
<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Young shoots as vegetable

<i>Ficus auriculata</i> Lour. (Moraceae)	Ripe fruits eaten in curries
<i>F. fistulosa</i> Reinw. ex Blume (Moraceae)	Young fruits eaten raw Ripe fruits are eaten
<i>F. leavis</i> Blume (Moraceae)	
<i>F. drupacea</i> Thunb. (Moraceae)	Fruits eaten with curries
<i>F. oligodon</i> Miq. (Moraceae)	Ripe fruits eaten
<i>F. pubigera</i> (Wallich ex Miq.) Brandis (Moraceae)	Fruits eaten
<i>F. sarmentosa</i> Buch. - Ham. ex J.E. Smith (Moraceae)	Fruits eaten as pickle
<i>F. semicordata</i> Buch.- Ham. ex J.E. Smith (Moraceae)	Ripe fruits eaten raw or in jams
<i>Fissistigma polyanthum</i> (Hook. f. & Thomson) Merr. (Annonaceae)	Fruits eaten as pickle
<i>Floscopa scandens</i> Lour. (Commelinaceae)	Leaves & tender shoot as vegetables
<i>Garcinia cowa</i> Roxb. ex DC. (Clusiaceae)	Leaves & fruits eaten raw or cooked
<i>Girardinia diversifolia</i> (Link) Friis (Urticaceae)	Leaves as vegetables
<i>Gmelina arborea</i> Roxb. (Verbenaceae)	Roasted fruits eaten
<i>Gouania tiliaefolia</i> Lam. (Rhamnaceae)	Young leaves as vegetable
<i>Grewia denticulata</i> Wallich ex Voigt (Tiliaceae)	Fruits as pickle
<i>Gynocardia odorata</i> (Roxb.) R. Br. (Flacourtiaceae)	Seeds as cereal
<i>Gynura crepidioides</i> Benth. (Asteraceae)	Leaves as vegetables
<i>Hedychium coronarium</i> Koenig (Zingiberaceae)	Rhizome as condiment
<i>Hodgsonia macrocarpa</i> (Blume) Congdon (Cucurbitaceae)	Fruits & seeds for its oil
<i>Houttuynia cordata</i> Thunb. (Saururaceae)	Roots & leaves as vegetables

<i>Hydrolea zeylanica</i> (L.) Vahl (Hydrophyllaceae)	Young Leaves as vegetable
<i>Hygrophila quadrivalvis</i> Nees (Acanthaceae)	Leaves as vegetables
<i>H. salicifolia</i> (Vahl) Nees (Acanthaceae)	Leaves as vegetables
<i>Imperata cylindrica</i> (L.) P. Beauv. (Poaceae)	Rhizome & young inflorescence as substitute for salt
<i>Ipomea cynosa</i> Roem. & Schult. (Convolvulaceae)	Leaves as vegetables
<i>Isachne albens</i> Trin. (Poaceae)	Young inflorescence as vegetables
<i>Jasminum sambac</i> (L.) Ait. (Oleaceae)	Flowers as tea flavour
<i>Kedura heteroclita</i> (Roxb.) Craib (Schisandraceae)	Fruits as pickle
<i>Laportea terminalis</i> Wight (Urticaceae)	Young shoots as vegetables
<i>Leea crispa</i> L. (Leeaceae)	Fruits cooked eaten
<i>Leea indica</i> (Burm. f.) Merr. (Leeaceae)	Fruits cooked eaten
<i>Lithocarpus dealbata</i> (Hook. f. & Thomson) Rehder (Fagaceae)	Roasted seed eaten
<i>Livistona jenkinsiana</i> Griffith (Arecaceae)	Leaves used for thatching
<i>Litsea cubeba</i> (Lour.) Pers. (Lauraceae)	Roots & fruits as vegetables
<i>Lophatherum gracile</i> Brongn. (Poaceae)	Leaves as vegetables
<i>Macrosolon cochinchinensis</i> (Lour.) V. Tiegh. (Loranthaceae)	Leaves as tea
<i>Maesa indica</i> Wallich (Myrsinaceae)	Leaves & fruits as condiment
<i>Melastoma melabathricum</i> L. (Melastomaceae)	Leaves & fruits as vegetables
<i>Mangifera sylvatica</i> Roxb. (Anacardiaceae)	Fruits eaten as pickle



<i>Mesua ferrea</i> L. (Clusiaceae)	Roasted fruits eaten
<i>Mikania micrantha</i> Kunth. (Asteraceae)	Leaves as vegetables
<i>Monochoria hastata</i> (L.) Solms. (Pontederiaceae)	Leaves as vegetables
<i>Mucuna monosperma</i> DC. ex Wight (Fabaceae)	Leaves & seeds as vegetables
<i>Murdania nudiflora</i> (L.) Brongn. (Commelinaceae)	Young shoots as vegetables
<i>Murraya paniculata</i> (L.) Jack. (Rutaceae)	Flowers & fruits mixed with tea
<i>Mussaenda glabra</i> Vahl (Rubiaceae)	Leaves used as tea
<i>M. roxburghii</i> Hook.f. (Rubiaceae)	Leaves as vegetables
<i>Myriactis wallichii</i> Less. (Asteraceae)	Leaves & young shoots as vegetables
<i>Natsiatum herpeticum</i> Buch.-Ham. ex Arn. (Icacinaceae)	Leaves & young shoots as vegetables
<i>Olax acuminata</i> Benth. (Oleaceae)	Leaves as vegetables
<i>Oxalis corniculata</i> L. (Oxalidaceae)	Leaves as salad
<i>Oxalis debilis</i> H.B.K. var. <i>corymbosa</i> (DC.) Lour.	Bulbs & leaves as vegetables
<i>Paederia foetida</i> L. (Rubiaceae)	Leaves eaten raw
<i>P. scandens</i> Merr. (Rubiaceae)	Stem as vegetables
<i>Pavetta indica</i> L. (Rubiaceae)	Fruits as pickle
<i>Polygonum chinense</i> L. (Polygonaceae)	Soft leaves as vegetables
<i>Pegia nitida</i> Coleb. (Anacardiaceae)	Leaves & fruits as vegetables
<i>Phoenix rupicola</i> T. Anderson (Arecaceae)	Stem pith, source of sago

<i>Phyllanthus urinaria</i> L. (Euphorbiaceae)	Leaves & fruits as vegetables
<i>Pilea glaberrima</i> Blume (Urticaceae)	Leaves & young stems as vegetables
<i>Pinanga gracilis</i> Blume (Arecaceae)	Fruits eaten as beetle nut
<i>Piper sylvaticum</i> Roxb. (Piperaceae)	Fruits as condiment
<i>Pogonatherum crinitum</i> (Thunb.) Kunth (Poaceae)	Young shoots as vegetables
<i>Pogostemon parviflorus</i> Benth. (Lamiaceae)	Leaves as vegetables
<i>P. minus</i> Hudson (Polygonaceae)	Leaves as vegetables
<i>P. strigosum</i> R. Br. (Polygonaceae)	Stem ash as substitute for salt
<i>Pothos cathcartii</i> Schott. (Araceae)	Leaves as vegetables
<i>P. scandens</i> L. (Araceae)	Leaves as vegetables
<i>Pratia nummularia</i> (Lam.) A. Br. & Aschers. (Campanulaceae)	Fruits as cereals
<i>Procris laevigata</i> non Blume (Urticaceae)	Fruits as pickles
<i>Quercus semiserrata</i> Roxb. (Fagaceae)	Seeds roasted & eaten
<i>Ricinus communis</i> L. (Euphorbiaceae)	Leaves & seeds and oil as purgative
<i>Rhynchosyche ellipticum</i> (Wallich ex Dietr.) A. DC. (Gesneriaceae)	Whole plant as vegetables
<i>Rubus lineatus</i> Reinw. (Rosaceae)	Fruits as pickles
<i>R. paniculatus</i> Smith (Rosaceae)	Fruits as pickles
<i>Sambucus javanica</i> Reinw. ex Blume (Sambucaceae)	Leaves, stems & fruits in different preparations
<i>Saurauia nepalensis</i> DC. (Saurauiaceae)	Fruits as pickles

<i>Saurauia punduana</i> Wallich (Saurauaceae)	Roasted fruits eaten
<i>S. roxburghii</i> Wallich (Saurauaceae)	Roasted fruits eaten
<i>Sauropus androgynus</i> (L.) Merr. (Euphorbiaceae)	Leaves & fruits as spices
<i>Scirpus ternatanus</i> Reinw. ex Miq. (Cyperaceae)	Fruits as spices
<i>Securingea virosa</i> (Roxb. ex Willd.) Baill. (Euphorbiaceae)	Fruits as pickle
<i>Setaria pallidifusca</i> (Schum.) Stapf & Hubb. (Poaceae)	Seeds as cereal
<i>S. palmifolia</i> (Koen.) Stapf (Poaceae)	Young shoots & seeds
<i>Solanum indicum non L.</i> (Solanaceae)	Leaves & fruits as vegetables
<i>S. spirale</i> Roxb. (Solanaceae)	Leaves & fruits as curris
<i>S. torvum</i> Swarz. (Solanaceae)	Leaves & fruits as condiment
<i>Spilanthes paniculata</i> Wallich ex DC. (Asteraceae)	Leaves as vegetable
<i>Stellaria media</i> (L.) Vill. (Caryophyllaceae)	Leaves & young shoots as vegetable & salad
<i>Stemone tuberosa</i> Lour. (Stemonaceae)	Roots & fruits as curris
<i>Stephania hernandifolia</i> (Willd.) Walp. (Menispermaceae)	Leaves as vegetable
<i>Syzygium cumini</i> (L.) Skeels. (Myrtaceae)	Fruits with salt, purgative
<i>Terminalia chebula</i> (Gaertn.) Retz. (Combretaceae)	Seeds for oil
<i>T. citrina</i> (Gaertn.) Flem. (Combretaceae)	Fruits as pickle
<i>Tetrastigma rumicispermus</i> (Lawson) Planchon (Vitaceae)	Fruits as pickle
<i>Themeda villosa</i> (Poiret) A. Camus (Poaceae)	Young shoots as vegetables

<i>Toddalia asiatica</i> (L.) Lam. (Rutaceae)	Leaves & fruits as vegetables
<i>Trema orientalis</i> (L.) Blume (Ulmaceae)	Leaves as salad
<i>Trichosanthes origera</i> Blume (Cucurbitaceae)	Roots as cereal
<i>T. tricuspidata</i> Lour. (Cucurbitaceae)	Leaves as vegetable
<i>Turpinia pomifera</i> (Roxb.) DC. (Staphylaceae)	Fruits as pickle
<i>Uraria crinata</i> Desv. (Fabaceae)	Whole plant as vegetable
<i>Urena lobata</i> L. (Malvaceae)	Seeds in puddings
<i>Viburnum corylifolium</i> Hook. f. & Thomson (Caprifoliaceae)	Leaves & fruits in tea
<i>Wallichia densiflora</i> Masters (Arecaceae)	Leaves used for thatching
<i>Xanthium strumarium</i> L. (Asteraceae)	Leaves, shoots as vegetable
<i>Zalacca secunda</i> Griffith (Arecaceae)	Leaves used for thatching & seeds eaten as belle nut
<i>Zanthoxylum armatum</i> DC. (Rutaceae)	Leaves & young shoots as vegetable

### MEDICINAL PLANTS

Namdapha Biosphere reserve (Proposed) harbours a very large number of Medicinal plants which are being used in different ways by the tribals inhabiting in the Changlang and Lohit districts of Arunachal Pradesh. Therefore, it is imperative to collect the folklore claims and their expertise and knowledge of remedies of medicinal plants could provide us a rich source of useful information. It would be appropriate to emphasise here that feasibility of such studies is very difficult because they never like interference from outsiders in their daily life. Obviously, they use the combination of several plants or their parts in different gradients to cure a particular disease. Most of the Kabiraj (Herbals) hesitate to disclose the exact combination due to superstitious belief that if they disclose their permutation and combination, the effect of the medicines will be liquidated. Of course, there are a large number of plants, which are in use since time immemorial. Some of these are listed below with their uses :

Name	Habit	Uses
<i>Abroma augusta</i> (L.) L. f. (Sterculiaceae)	Shrub	Roots used in urinary disorders
<i>Achyranthes aspera</i> L. (Amaranthaceae)	Herb	Roots used in urinary disorders; stem & leaves in boils, wet piles, skin diseases & seeds in hydrophobia
<i>Achyranthes bidentata</i> Blume (Amaranthaceae)	Herb	Plant promote the discharge of urine
<i>Ageratum conyzoides</i> L. (Asteraceae)	Herb	Leaves used in cuts & sores.
<i>Albizia procera</i> (Roxb.) Benth. (Mimosaceae)	Tree	Leaves used to cure Ulcers
<i>Alpinia allughas</i> (Retz.) Rose. (Zingiberaceae).	Tall Herb	Rhizome used in fever & rheumatism
<i>Alternanthera sessilis</i> (L.) R. Br. (Amaranthaceae)	Herb.	Plant used in discharge of mucous from the nose and rheumatism
<i>Amaranthus spinosus</i> L. (Amaranthaceae)	Herb	Roots used in contagious infections ; leaves promoting the discharge of urine
<i>Amomum aromaticum</i> Roxb. (Zingiberaceae)	Herb	Seeds used as antidote to scorpion & snake bites
<i>Anthocephalus chinensis</i> (Lam.) A. Rich. ex Walp. (Rubiaceae)	Tree	Leaves used in cases of ophthalmia and stomatitis
<i>Aquilaria malaccensis</i> . Lam. (Thymelaeaceae)	Herb	Wood used as astringent in diarrhoea and vomiting
<i>Arundinella nepalensis</i> Trin. (Poaceae)	Herb	Plants used in healing of wounds
<i>Arundo donax</i> L. (Poaceae)	Herb	Rhizome used in menstrual discharge & also promoting the discharge of urine
<i>Barleria cristata</i> L. (Acanthaceae)	Shrub	Roots & leaves used in cough & swellings
<i>Bidens pilosa</i> L. (Asteraceae)	Herb	Leaves are used in ear & eye troubles & ulcers
<i>Brassica rapa</i> L. subsp. <i>campestris</i>	Herb	Roots & seeds are used

(L.) Clepham. (Brassicaceae)		to prevent scurvy
<i>Buddlea asiatica</i> Lour. (Buddlejaceae)	Shrub	Plants are used as abortifacient & skin diseases
<i>Callicarpa arborea</i> Roxb. (Verbenaceae)	Shrub or small tree	Stem bark is used in indigestion, gastric troubles and other diseases
<i>Cannabis sativa</i> L. (Cannabaceae)	Shrub	Plant used in stomach disorders & appetite
<i>Caryota urens</i> L. (Arecaceae)	Lofty palm	Fruits are used in head ache
<i>Centella asiatica</i> (L.) Urban (Apiaceae)	Herb	Plants used as tonic, blood purifier ; leaves for skin diseases, leprosy and rheumatism
<i>Chirita vestitum</i> A. DC. (Gesneriaceae)	Herb	Leaves used in itching
<i>Cinnamomum tamala</i> (Spr.) Nees & Eberm. (Lauraceae)	Tree	Leaves used in diarrhoea and rheumatism
<i>Cissampelos pareira</i> L. (Menispermaceae)	Twining shrub	Tuber acts as diuretic, generally taken after delivery ; leaves for itching ; Roots are also used in case of snake bite
<i>Citrus medica</i> L. (Rutaceae)	Shrub	Fruits juice taken in indigestion; roots used in vomiting and urinary troubles
<i>Clerodendrum colebrookianum</i> Walp. (Verbenaceae)	Shrub	Leaves are used in fever; bark for malaria
<i>C. divaricatum</i> Jack. (Verbenaceae)	Shrub	Roots and leaves are taken in dysentery and fever & also useful in cephalalgia
<i>Cnix lachrymajobi</i> L. (Poaceae)	Herb	Roots used in mental disorders & promoting the discharge of urine; seeds abortifacient
<i>Costus speciosus</i> (Koen.) Smith. (Zingiberaceae)	Tall herb	Rhizomes used in respiratory troubles

<i>Crotalaria albida</i> Heyne ex-Roth (Fabaceae)	Herb	Roots used as purgative
<i>Croton caudatus</i> Geiseler (Euphorbiaceae)	Shrub	Fruits used in vomiting
<i>Cryptolepis buchanani</i> Roem. & Schult. (Asclepiadaceae)	Chimber	Plants used to cure rickets in children
<i>Cyathea gigantea</i> (Wallich) ex Hook. f.) Holttum (Cyatheaceae)	Woody shrub or herb	Leaves used in swelling
<i>Cyathula prostrata</i> Blume (Amaranthaceae)	Herb	Roots used for dysentery and skin diseases
<i>Desmodium triquetrum</i> (L). DC. (Fabaceae)	Under shrub	Leaves used in piles
<i>Dillenia indica</i> L. (Dilleniaceae)	Tree	Fruits used in cough, fever and weakness
<i>Dioscorea pentaphylla</i> L. (Dioscoreaceae)	Climber	Tubers used in bile, bronchial asthma and rheumatism
<i>Elaeocarpus sphaericus</i> (Gaertner) Schumann (Elaeocarpaceae)	Tree	Flowers and fruits used in cardiac disorders
<i>Equisetum diffusum</i> D. Don (Equisetaceae)	Herb	Plant used in joining broken bones of cattles
<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Herb	Plants used in bronchial asthma, dysentery and worms
<i>Floscopa scandens</i> Lour. (Commelinaceae)	Herb	Stem juice used in eye trouble
<i>Garcinia acuminata</i> Planch. & Triana (Clusiaceae)	Tree	Fruits used in stomach disorder
<i>G. cowa</i> Roxb. ex DC. (Clusiaceae)	Tree	Fruits used in gastrointestinal problems
<i>Gynocardia odorata</i> R. Brown (Flacourtiaceae)	Tree	Seeds used in leprosy, nausea and rheumatism; bark used in cuts, wounds and insect stinging
<i>Hedychium coronarium</i> Koenig (Zingiberaceae)	Herb	Rhizomes paste applied in case of bone - ache
<i>Houttuynia cordata</i> Thunb. (Saururaceae)		Rhizomes taken in cough and leaves in cholera

<i>Hydnocarpus kurzii</i> (King) Warb. (Flacourtiaceae)	Tree	Barks used in itching and toothache
<i>Hydrolea zeylanica</i> Vahl (Hydrophyllaceae)	Shrub	Leaves antiseptic, used to cure ulcers
<i>Jasminum multiflorum</i> (Burm. f.) T. Anderson (Oleaceae)	Shrub	Roots antidote to cobra venom ; leaves used to cure ulcers
<i>J. sambac</i> (L.) Ait. (Oleaceae)	Shrub	Flowers used as lactifuge arresting secretion of milk
<i>Leea crispa</i> van Royen ex L. (Vitaceae)	Shrub	Tubers in worms ; leaves in wounds
<i>L. indica</i> (Burm. f.) Merr. (Vitaceae)	Shrub	Roots used in diarrhoea and dysentery
<i>Maesa indica</i> (Roxb.) A. DC. (Myrsinaceae)	Shrub or small tree	Roots used in syphilis ; fruits anthelmintic
<i>Mastersonia assamica</i> Benth. (Fabaceae)	Woody climber	Leaves used in wounds
<i>Mesua ferrea</i> L. (Clusiaceae)	Tree	Leaves and flowers used in snake bite and scorpion sting ; flowers are also used in piles
<i>Millettia roxburghiana</i> (Wallich) Hook. f. & Thomson (Annonaceae)	Shrub	Leaves used in headache.
<i>Musa velutina</i> Wendl. & Drude (Musaceae)	Tall perennial herb or shrub	Pseudostem used in dysentery, check the bleeding.
<i>Oxalis corniculata</i> L. (Oxalidaceae)	Herb	Plants used in scurvy
<i>Palhinhaea cernua</i> (L.) Franco (Lycopodiaceae)	Herb	Plants used in rheumatism
<i>Pavetta indica</i> L. (Rubiaceae)	Shrub or small tree	Roots in visceral obstructions ; leaves in haemorrhoidal pains
<i>Persicaria chinensis</i> (L.) I. Gross. (Polygonaceae)	Shrub	Plants used in curing wounds
<i>Persicaria hydropiper</i> (L.) Spach (Polygonaceae)	Herb	Stems and leaves used in urinary disorders



<i>Piper thomsoni</i> (C. DC.) Hook. f. (Piperaceae)	Climber	Roots promote the discharge of urine
<i>Pogostemon pubescens</i> Benth. (Lamiaceae)	Herb	Roots in haemorrhage and antidote for scorpion sting
<i>Pothos scandens</i> L. (Araceae)	Climbing Shrub	Leaves used to cure small pox
<i>Schima wallichii</i> Choisy (Theaceae)	Tree	Roots & leaves used in fever
<i>Sida acuta</i> Burm. f. (Malvaceae)	Shrub	Roots in typhoid fever and nervous disorders
<i>Siegesbeckia orientalis</i> L. (Asteraceae)	Herb	Plants used in ulcers and sores
<i>Solanum indicum</i> L. (Solanaceae)	Shrub	Seeds are stimulant
<i>S. torvum</i> Swartz (Solanaceae)	Shrub	Roots as oral contraceptive; leaves in indigestion & fruits in itching as well as for enlargement of spleen
<i>Spilanthes paniculata</i> Wallich ex DC. (Asteraceae)	Herb	Flowers used in toothache
<i>Syzygium cumini</i> (L.) Skeels (Myrtaceae)	Tree	Fruits in stomach disorders, diarrhoea ; seeds in diabetes
<i>Tacca integrifolia</i> Ker - Gawler (Taccaceae)	Herb	Leaves used in dysentery
<i>Terminalia chebula</i> Retz. (Combretaceae)	Tree	Fruits in chronic ulcers
<i>Toddalia asiatica</i> (L.) Lam. (Rutaceae)	Shrub	Roots used in diarrhoea & fever
<i>Toona ciliata</i> Roem. (Meliaceae)	Tree	Bark used externally in case of ulcers, also useful in fever and rheumatism
<i>Trema orientalis</i> (L.) Blume (Ulmaceae)	Tree	Plants used in diseases of nervous system
<i>Xanthium strumarium</i> L. (Asteraceae)	Shrub	Plants used in inflammation of the thyroid glands and ulcers
<i>Zanthoxylum armatum</i> DC. (Rutaceae)	Small tree	Leaves used in indigestion, twigs in toothache

### WILD RELATIVES OF CULTIVATED PLANTS

The forests explored so far are rich in wild species of cultivated plants. Some of the important plants are given below :

*Artocarpus chama* Buch. Ham. ex Roxb. (Wild Jack Fruit) -- A tall tree with edible fruits.

*Camellia caudata* Wallich (Wild Tea) -- A common small tree grows under the dense canopy of tall trees.

*Citrus medica* L. -- A wild citrus allied to cultivated common lime, distributed at lower altitudes in the proposed Biosphere.

*Coffea benghalensis* Heyne ex Roem. & Schult. (Wild Coffee) -- A shrub with white flowers.

*C. khasiana* Hook. f. (Wild Coffee) -- A common shrub with orange-red flowers.

*Coix gigantea* Roxb.-- Plants are grown in the kitchen garden for its seeds, which is an aborigine.

*Coix lacrymajobi* L. -- Plants are cultivated in the kitchen gardens for its seeds.

*Ensete glaucum* (Roxb.) Cheesman -- Wild banana found growing on the road side before Deban.

*Mangifera sylvatica* Roxb. -- Wild mango plant collected near 36th mile and 40th mile with long pendulous bunches of beaked fruits. Mature fruits are pinkish - red with leathery thick edible skin and very thin non - fibrous covering over the nut.

*Musa glauca* Roxb. -- A tall wild banana, common in moist and open places on forest edges.

*Musa rosacea* Jacq. -- A common wild banana on road sides and forest edges.

*Musa velutina* Wendl. & Drude -- A common gregarious dwarf banana with attractive erect, bright red spadix.

**LIST OF ENDEMIC SPECIES**  
 INDICATING EITHER ENDEMIC TO ARUNACHAL PRADESH OR TO  
 NORTH EAST INDIA INCLUDING SIKKIM

Name of taxa	Family	Endemic to Arunachal Pradesh	Endemic to North-east India and Sikkim
<i>Acanthus leucostactys</i> Nees	Acanthaceae	--	+
<i>Acer oblongum</i> Wallich ex DC. var. <i>microcarpum</i> Hiern	Aceraceae	+	--
<i>A. sikkimensis</i> Miq. var. <i>serrulatum</i> Pax	Aceraceae	+	--
<i>Aconitum lethale</i> Griffith	Ranunculaceae	+	--
<i>Aeschynanthes parasitica</i> (Roxb.) Wallich	Gesneriaceae	--	+
<i>Aglaia edulis</i> A. Gray	Meliaceae	--	+
<i>Anoectochilus sikkimensis</i> King & Pantl.	Orchidaceae	--	+
<i>Arundinaria hookeriana</i> Munro	Bambusaceae	--	+
<i>Baliospermum micranthum</i> Mull. -- Arg.	Euphorbiaceae	--	+
<i>Bauhinia khasiana</i> Baker	Caesalpiaceae	--	+
<i>Begonia aborensis</i> Dunn	Begoniaceae	+	--
<i>B. iridescens</i> Dunn	-do-	+	--
<i>B. obversa</i> C.B. Clarke	-do-	--	+
<i>B. silhetensis</i> C.B. Clarke ex Hook. f.	-do-		+
<i>Bulbophyllum ornatissimum</i> (J.E. Smith) Lindley	Orchidaceae		+
<i>Calamus leptospadix</i> Griffith	Areaceae		+
<i>Calanthe densiflora</i> Lindley	Orchidaceae		+
<i>Capparis acutiflora</i> (Sw.) Haridasan & Rao	Capparaceae		+
<i>Capparis pallidum</i> Munro	-do-		+
<i>Ceratostylis subulata</i> Blume	Orchidaceae	+	
<i>Chirita mishniensis</i> Debb. ex Biswas	Gesneriaceae	+	
<i>Clerodendrum lasiocephalum</i> C.B. Clarke	Verbenaceae		+
<i>Coffia khasiana</i> Hook. f.	Rubiaceae		+

<i>Cuculigo crassifolia</i> (Baker) Hook. f.	Hypoxidaceae		+
<i>Cymbidium eburnerum</i> Lindley	Orchidaceae	+	
var. <i>parishii</i> (Reichb. f.) Hook. f.			
<i>Dendrobium cathcartii</i> Hook. f.	-do-		+
<i>D. sulcatum</i> Lindley	-do-		+
<i>D. hookerianum</i> Lindley	-do-		+
<i>Didymosperma nana</i> H. Wendl.	Arecaeae		+
<i>Dioscorea wattii</i> Prain & Burk.	Dioscoreaceae		+
<i>Diplomeris pulchella</i> D. Don	Orchidaceae		+
<i>Dysoxylum pullens</i> Hiern	Meliaceae		+
<i>D. reticulatum</i> King	-do-		+
<i>Echinocarpus tomentosus</i> Benth.	Flacocarpaceae		+
<i>Embelia subcoriacea</i> (C.B. Clarke) Mez	Myrsinaceae		+
<i>Eria clausa</i> King & Pantl.	Orchidaceae		+
<i>E. ferruginea</i> Lindley	-do-		+
<i>Euonymus glaber</i> Roxb.	Colastraceae	+	
<i>Galeola falconeri</i> Hook. f.	Orchidaceae		+
<i>Garcinia acuminata</i> Planchon	Clusiaceae		+
<i>Gentiana campanulacea</i> (Wallich & Griffith) Marg.	Gentianaceae		+
<i>Globa multiflora</i> Wallich ex Baker	Zingiberaceae		+
<i>Glycosmis cynnosa</i> (Kurz) Narayanaswamy	Rutaceae		+
<i>Goldfussia glabrata</i> (Nees) Balakr.	Acanthaceae		+
<i>Grewia denticulata</i> Wallich ex Voigt	Tiliaceae		+
<i>Haematocarpus validus</i> (Miers) Bakh. f. ex Forman	Menispermaceae		+
<i>Hoya lobbi</i> Hook. f.	Asclepiadaceae		+
<i>Impatiens assamica</i> Bruce	Balsaminaceae		+
<i>I. bracteolata</i> Hook. f.	-do-		+
<i>I. laevigata</i> Hook. f. & Thomson	do-		+
<i>I. latiflora</i> Hook. f. & Thomson	-do-		+
<i>I. mishnensis</i> Hook. f. & Thomson	-do-		+

<i>Impatiens porrecta</i> Wallich ex Hook. f. & Thomson	Orchidaceae	+
<i>I. racemulosa</i> Wallich ex Hook. f. & Thomson	-do-	+
<i>Indigofera nigreseens</i> King	Fabaceae	+
<i>Jasminum lanceolaria</i> Roxb.	Oleaceae	+
<i>Lasianthus hookeri</i> C.B. Clarke ex Hook. f.	Rubiaceae	+
<i>L. sikkimensis</i> Hook. f.	-do-	+
<i>L. tubiflorus</i> Hook. f.	-do-	+
<i>Liparis assamica</i> King & Pantl.	Orchidaceae	+
<i>L. distans</i> C.B. Clarke	-do-	+
<i>L. plantaginea</i> Lindley	-do-	+
<i>Livistona jenkinsiana</i> Griffith	Arecaceae	+
<i>Loxostigma griffithii</i> (Wight) C.B. Clarke	Gesneriaceae	+
<i>Luculia pinceana</i> Hook.	Rubiaceae	+
<i>Magnolia baillonii</i> Pierre	Magnoliaceae	+
<i>M. griffithii</i> Hook. f. & Thomson	-do-	+
<i>Musa velutina</i> Wendl. & Drude	Musaceae	+
<i>Ophiorrhiza calcarata</i> Hook. f.	Rubiaceae	+
<i>O. hispida</i> Hook. f.	-do-	+
<i>Orthosiphon wattii</i> Prain	Lamiaceae	+
<i>Paphiopedilum wardii</i> Summerh.	Orchidaceae	+
<i>Paravatia elliptica</i> (Hemsl.) Nayar & Paul	Lardizabalaceae	+
<i>Pauia belladonna</i> Deb & Dutta	Solanaceae	+
<i>Peliosanthes bakeri</i> Hook. f.	Liliaceae	+
<i>Phaius rubra</i> Lindley	Orchidaceae	+
<i>Phlogocanthus parviflorus</i> T. Anderson.	Acanthaceae	+
<i>P. tubiflorus</i> Nees	-do-	+
<i>Phoenix rupicola</i> T. Anderson	Arecaceae	+
<i>Podochilus khasianus</i> Hook. f.	Orchidaceae	+
<i>Polynura geminata</i> Hook. f.	Rubiaceae	+

<i>Premna nulleflora</i> C.B. Clarke	Verbenaceae		+
<i>Prenanthes scandens</i> Hook. f. & Thomson ex C.B. Clarke	Asteraceae	+	
<i>Pternopetalum senii</i> Deb & Dutta	Apiaceae	-	
<i>Pteracanthus nobilis</i> (C.B. Clarke) Bremek.	Acanthaceae		+
<i>Rhaphidophora hookeri</i> Schott.	Araceae		+
<i>Rhus chinensis</i> Miller	Anacardiaceae		+
<i>Rubus burkillii</i> Rolfe	Rosaceae	+	+
<i>Sauropus stipulatus</i> Hook. f.	Euphorbiaceae		+
<i>Shorea assamica</i> Dyer	Dipterocarpaceae		+
<i>Spiradiclis bifida</i> Kurz	Rubiaceae		+
<i>Spiradiclis cylindrica</i> Hook. f.	-do-		+
<i>Strobilanthes secundus</i> T. Anderson	Acanthaceae		+
<i>Strychnos quintuplinervis</i> A.W. Hill.	Strychnaceae		+
<i>Symplocos pealii</i> King & Das	Symplocaceae	+	
<i>Tetrastigma obovatum</i> (Lawson) Gagnepain	Vitaceae		+
<i>Trichodesma khasianum</i> C.B. Clarke	Boraginaceae		+
<i>Tylasis discolor</i> Hook. f.	Orchidaceae		+
<i>Viburnum corylifolium</i> Hook. f. & Thomson	Caprifoliaceae		+
<i>Vitis planicaulis</i> Hook. f.	Vitaceae		+
<i>Wallichia triandra</i> (Joseph) S.K. Basu	Areaceae	+	
<i>Zatoca secunda</i> Griffith	-do-		+

### RARE AND INTERESTING PLANT RECORDS :

*Aeschynanthes superba* C.B. Clarke (Gesneriaceae) - A stout epiphyte with umbellate showy red flowers collected near 19th mile and 26th mile makes a further distributional record for Arunachal Pradesh. Earlier it was reported endemic to Meghalaya (Balakrishnan, 1983).

*Angiopteris evecta* Hoggm. (Angiopteridaceae) - A terrestrial fern of rare occurrence collected from 26th mile area.

*Arachnis cathcartii* (Lindley) J.J. Smith (Orchidaceae) -- A rare epiphytic orchid with large brownish -- red flowers.

*A. clarkei* (Reichb. f.) J.J. Smith (Orchidaceae) -- A rare epiphytic orchid with large brownish -- red flowers.

*A. khasiana* Wallich (Thymeleaceae) -- Small tree, known so far from Meghalaya. Its occurrence in Namdapha forms a new distributional record of Arunachal Pradesh.

*Aquilaria malaccensis* Lam. (Thymeleaceae) -- A large evergreen tree collected near Miao and 40th mile area. Due to over exploitation of this tree for extraction of *Agar* it is becoming rare in accessible areas.

*Balanophora dioica* R. Br. (Balanophoraceae) -- A rare, fleshy root parasite which grows in undisturbed forests of Namdapha.

*Bruinsmia polysperma* (C.B. Clarke) Van. Steenis (Styraceae) -- A small tree of extremely rare occurrence could be collected from the Biosphere Reserve.

*Cinnamomum glanduliferum* (Nees) Meiss. (Lauraceae) -- The fruits of this tree are aromatic and used in the preparation of 'Attar' reported to be endangered (Shah, 1983) from U.P. Himalaya, have been collected near Deban.

*Cheirostylis pusilla* Lindley (Orchidaceae) -- A small extremely rare, terrestrial orchid collected near Deban was reported hitherto from Khasi Hills (Hooker, 1890) and Garo Hills (Kumar and Rao, 1983). Present collection makes a further distributional record of this species from Arunachal Pradesh.

*Cyathea gigantea* (Wallich ex Hook.) Holttum (Cyatheaceae) - The giant tree fern of botanical interest. Widely distributed in hilly regions of eastern and peninsular India, but nowhere reported abundant. It is quite common in Namdapha.

*Cymbidium eburneum* Lindley var. *parishii* (Reichb. f.) Hook. f. (Orchidaceae) -- A rare orchid known only from Changlang District of Arunachal Pradesh.

*Diplomeris pulchella* D. Don (Orchidaceae) -- A rare, terrestrial, showy white flowered orchid reported to be extremely rare and endemic species to Meghalaya (Kumar & Rao, 1983) could be collected near 13th mile area thereby extending its distribution to Arunachal Pradesh.

*Galeola altissima* (Blume) Reichb. f. (Orchidaceae) -- A saprophytic orchid known so far only from Assam could be collected from 17th mile area thereby extending its distribution to Arunachal Pradesh.

*Gnetum gnemon* L. (Gnetaceae) -- A very rare shrubby gymnosperm of botanical interest. Fruits are edible, the plant is of great medicinal value. Collected from Jairampur forest.

*G. ula* Brongn. (Gnetaceae) -- A rare twining climber of botanical interest collected around 40th mile camp.

*Iodes hookeriana* Baill. (Icacinaeae) -- A climbing shrub with attractive panicles of yellow -- red drupes, collected near Miao, reported to be of rare occurrence from Khasi Hills (Jain & Sastry, 1980 ; Sastry, Kataki & Chauhan, 1983.)

*Liparis distans* C.B. Clarke (Orchidaceae) -- A rare epiphytic orchid with largest flowers collected from the proposed Biosphere Reserve.

*Livistona jenkinsiana* Griffith (Arecaceae) -- The only species of the genus localised in some selected valleys of North -- eastern India. Reported to be endangered. This beautiful fan leaved palm collected near 36th mile. Endemic to North - east region.

*Magnolia griffithi* Hook. f. & Thomson (Magnoliaceae) Trees, endemic to Assam, collected near Miao, reported to be rare due to clearance of forest for timber and other purposes.

*Magnolia pterocarpa* Roxb. (Magnoliaceae) -- Tall trees, scarce in the North -- eastern region, occurs in the Biosphere.

*Pentstemon wallichii* Wight (Asclepiadaceae) -- An extremely rare tufted herb or small shrub collected near Deban. There is no specimen of this in ASSAM herbarium. Present collection forms an interesting plant record after a lapse of many years.

*Psilotum nudum* (L.) P. Beauv. (Psilotaceae) -- A small extremely rare and primitive plant of botanical interest collected near 34th mile growing epiphytically on a tree -- fern.

*Rhopalocnemis phalloides* Jungb. (Balanophoraceae) -- A rare, stout, fleshy and interesting large root parasite collected from dense evergreen forest near 40th mile camp growing solitary or in clusters on roots of Vitaceae host



plants. The female inflorescence is very large and fleshy about 25 cm tall and 10 -- 15 cm in circumference, brown to rusty brown in colour, ovoid to oblong.

*Sapria himalayana* Griffith (Rafflesiaceae) -- A large and rare root parasite growing in the dense and undisturbed forest have been collected near 40th mile area and Kumon Bum.

### FAUNA OF THE PROPOSED BIOSPHERE RESERVE

The Biosphere Reserve consists of a diverse pattern of vegetation. As the area is autotrophic component which leads to a result and richness of heterotrophic organisms and facilitate the inhabitation of rich and diverse fauna. According to Kaurup (1974) the Assam region serves as a great faunal gateway through which the Indo -- Chinese elements of the oriental fauna and also that of the palaeartic could spread to Indian and colonize the country at the time when the land connection between the Indian Peninsula and the Asiatic mass to its north was formed. The most of the faunal dispersal has taken place through the Assam gateway due to the natural barriers as Thar and Rajasthan desert on the Western parts of the country. As a result the Indo -- Chinese elements predominates in the Indian fauna. More than 120 species of mammals, 560 species of birds and 90 species of reptiles and amphibians have been recorded from the region.

### LIST OF THE SOME COMMON WILD ANIMALS

1.	<i>Ailurus fulgens</i>	Red Panda
2.	<i>Bos gaurus</i>	Gaur
3.	<i>Capricornis sumatrensis</i>	Serow
4.	<i>Felis bengalensis</i>	Leopard Cat
5.	<i>Felis chaus</i>	Jungle Cat
6.	<i>Felis marmorata</i>	Marbled cat
7.	<i>Felis temmincki</i>	Golden cat
8.	<i>Felis viverrina</i>	Fishing cat
9.	<i>Hycobates hoolock</i>	Hollock gibbon
10.	<i>Helarctos malayanus</i>	Malayan sunbear
11.	<i>Herpestes edwardsi</i>	Common mongoose
12.	<i>Herpestes wiva</i>	Crab-eating mongoose
13.	<i>Macaca assamensis</i>	Assamese macaque
14.	<i>Macaca speciosa</i>	Stump tailed macaque

\* Source : The Namdapha Biosphere Reserve, Project document. Man & Biosphere Programme. Department of Environment, Government of India & Field Director, Project Tiger, Namdapha Miao, Arunachal Pradesh.

15.	<i>Manis pentadactyla</i>	Chinese pangolin
16.	<i>Martes flavigula</i>	Himalayan yellow throat mar - ten.
17.	<i>Melutius ursinus</i>	Sloth deer
18.	<i>Moschus moschiferus</i>	Musk deer
19.	<i>Muntiacus muntjak</i>	Barking deer
20.	<i>Nemorhaedus goral</i>	Goral
21.	<i>Neofelis nebulosa</i>	Clouded leopard
22.	<i>Nycticebus coucang</i>	Slow loris
23.	<i>Panthera pardus</i>	Leopard
24.	<i>Panthera tigris</i>	Tiger
25.	<i>Panthera uncia</i>	Slow leopard
26.	<i>Paradoxurus hermaphroditus</i>	Common palm civet
27.	<i>Payumalar larvata</i>	Himalayan palm civet
28.	<i>Presbytis entellus</i>	Common langur
29.	<i>Prionodon pardicolor</i>	Spotted linsang or Tiger civet
30.	<i>Ratufa bicolor</i>	Malayan giant Squirrel
31.	<i>Ratufa indica</i>	Indian giant Squirrel
32.	<i>Selenarctos thibetanus</i>	Himalayan black deer

**BIRDS :** As it has already been mentioned about that ca 5 60 species of birds have so far been recorded from the reserve area. Few important ones are as follows :-

1.	<i>Aquila chrysaetos</i>	Golden Eagle
2.	<i>Buceros bicornis</i>	The great Indian horn bill
3.	<i>Gypaetus barbatus</i>	Bearded Vulture
4.	<i>Ictinaetus malayensis</i>	Black Eagle
5.	<i>Tragopan blythii</i>	Blythis Tragopan.

The recent work on the identification of animal species which has been carried out by Dr. Salim Ali, Dr. S.D. Riplay and the Scientists of Zoological Survey of India which gives the interesting findings about the hidden truth of nature as follows :

(a) A new species of short wing (Turdinae) and a new subspecies of Scimitar Babbler (*Pometorhinus*) have been collected in dense evergreen

rain forest along the Noa --Dihing river and later on described a new findings to Science.

(b) A new genus and new species of mammals of flying squirrel named Namdapha flying Squirrel (*Biswamoyopterus bisswassi*) was recorded in this area (Saha, 1983.)

(c) The fish fauna collected from the drainage system of Dihing river, reveal at least 40 species, of which 4 species are new to Science, 2 species are the new record to India and a number of species have been collected for the first time in this area.

(d) The critical studies on Amphibians have yielded 2 new species and 12 new records for the reserve. Besides, a good number of rare and endangered species have also been collected from this region.

Under the effective conservation or management of rare animal species, the Project Tiger staff have successfully carried out breeding programme of white -- winged woodduck (*Cairina scutulata*) at Miao Zoo. It is one of the rarest species of white -- winged woodduck received from Hongkong and England recently. Conservation of this bird is being done under captive breeding programme as this species has dwindled considerably in the natural system.

The proposed reserve consist of virgin forests as a result animals found in this area are quite rich and represent a wide range of faunal diversity. Ecologically, it may be emphasised that the area is having balanced ecosystem(s). Interestingly, the human interference in this area is almost negligible, as such the limiting factors are not apparently visible due to the rich vegetative cover, optimum temperature and humidity coupled by well distributed rainfall, etc. It would not be out of place to mention here that animal depend directly or indirectly on plants for their existence i.e. food, shelter and breeding, etc. The identification of various plant species with the beneficiary animal species of the area is *Sine quanon*, which are absolutely essential for successful management of the area as a healthy habitat. For instance, in the reserve, the maximum concentration of the animals are at certain localities viz. Bulbulia, Hornbill and the 27th mile on --ward on M.V. road, etc. whether it is due to the occurrence of salt lick (Salty water) or some other factors, to be ascertaind. Therefore, it is imperative to mention here that animal and plant relationship of the selected rich biological diversity should be studied on priority basis, which could not be worked out due to lack of time as well as inaccessibility of the area.

## THREATS & CONSERVATION

### WORKING PLAN FOR REMEDIAL MEASURES AND UTILISATION

Judicious planning to facilitate perpetual utilisation of organic resources is the hall mark of conservation. Lack of proper knowledge of biological principles and ecological implications of over exploitation of biological resources, coupled with the ever increasing need and greed of the man, have been instrumental in depauperisation of the living resources which ironically sustain him. The concept of conservation broadly envisages preservation or protection and rehabilitation of wild life in their natural habitats for long term scientific, aesthetic and economic utilisation for the benefit of mankind, which can be expressed in mathematical formula:  $C = P + R$  (Joseph). This is originally based on the concept of 'Sustained yield' of those products for which there is greater demand and would give maximum economic return. Cragg (1970) emphasised on the following basic tenets of conservation.

1. Maintenance and perpetuation of environmental quality
2. Aesthetic considerations
3. Food production
4. Preservation of genepool and germplasm
5. Ecological diversity

To meet these requirements, and to establish a relationship between conservation and sustainable development, World Conservation strategy has been launched by the IUCN with the support of World Wild Life Fund (WWF). It is intended to stimulate a more committed approach to the management of living resources, and to provide policy guidance on how this can be carried out by Governmental and non-governmental bodies.

The concept of biosphere reserve is one such method wherein specific natural ecosystems are conserved and managed for posterity. As such, it involves conservation, restoration and the acquisition on knowledge of living resources in different ecosystems, which can be utilised for meeting scientific, economic, educational, cultural and recreational needs. This also involves promoting conservation of undisturbed natural ecosystems for preserving genetic diversity in *totality*. Apart from its primary role as reservoirs of genetic material and to facilitate research relevant to the flora and fauna, they are also ideal sites to promote environmental education. There can be no better learning laboratories for education on nature than the natural ecosystems themselves.

**I. STRUCTURE :** The biosphere reserve have in essence the core area' as the *Sanctum Sanctorum*, which are strictly protected to maintain their ecological integrity. The core area is surrounded by peripheral 'buffer, manipulation and restoration zones' for the manipulative research towards development, taking into account the traditional cultures and the land use patterns/practices. Each reserve includes one or more of the following categories : (a) natural biomes (b) unusual or unique communities (c) harmonious landscapes resulting from traditional land use practices and (d) modified or degraded ecosystems which still have some capacity to revert to more natural conditions.

**II. SELECTION CRITERIA :** While selecting the representative natural areas it is suggested that the following criteria must be regarded as mandatory (UNESCO -- MAB, final report No. 22, 1972).

*a/ Representativeness :* It must represent a sum total of the biological communities occurring within a single life zone (biome) where climate is similar, so that information relating to the nature and dynamics of the reserve area can be extrapolated to similar areas throughout the biogeographical region.

*b/ Uniqueness :* A very important characteristic is the uniqueness associated with a biosphere. It will not be out of place to mention that India has contributed to the World ca 150 economic taxa whose centre of origin/diversity lie in India alongwith their wild --relatives and land races. Thus from this point of view, our biosphere resources are not only relevant to our country but to world at large.

*Natural genetic diversity :* The biosphere reserve should contain abundant genetic diversity. India harbours nearly 45,000 species of plants and 65,000 species of animals. For its size it may have the largest conservation of species per unit area.

*Endangered species ;* There may be critical areas within the biome such as the centres of distribution of particular floristic elements of rare, endangered and threatened species of plants and animals. These may be endangered due to biotic or biotypic depletion on account of their relict nature or even by virtue of being very young and evolving species which did not have enough time to spread their ranges.

*e/ Naturalness :* Priority being placed on the least modified areas and the modification should be interpreted broadly to include a range of conditions from total destruction of natural habitats.

*f/ Effectiveness as Conservation Unit :* A biosphere reserve should be effective, size wise, to maintain natural population in numbers which

should not lead to genetic drift in time to come. Besides, it may also have natural protective barriers. The area would be self - regulating and far from human interference with legal protection which is of utmost necessity.

*g/ Research :* There should be ample opportunity for research in areas such as ecology - environment, population genetic, evolutionary biology, plant - animal interaction, land use management, eco - development and socioeconomic, etc.

The MAB report (1974) suggests that IUCN system for classification of natural regions would be helpful for selection of representative biomes and ecosystems types (Dasmann, 1972, 1973, 1974). Udavardy (1975) has further emphasized that this system and its application to classify the protected areas would be an effective conservation strategy.

### **NEED FOR THE CONSERVATION OF ECOSYSTEM THROUGH THE BIOSPHERE RESERVE IN NORTH - EASTERN INDIA**

The wild flora and fauna are the integral part of the renewable natural resources of the tropical evergreen forests of North - eastern region. They co - exist in complex ecosystems exhibiting great biological diversity. The biological diversity encompasses two basic things, viz. genetic diversity relating to intra-specific variability among individuals, and the richness of species in a community. These genetic resources are most precious and are nature's gift to mankind. Million of years of evolution have brought these forth, and being biologically active are extremely vulnerable to excessive biotic interferences.

Tropical rain forests in South East Asia are considered, by many botanists and ecologists, as one of the most complex and species - rich terrestrial ecosystems (van Steenis, 1951 ; Richards, 1952 ; Ashton, 1964 ; Poore, 1968 ; Jacob, 1974 and Whitnoor, 1975). These ecosystems support huge vegetal wealth with enormous economic potentialities such as timber and fruit trees, ornamental plants and medicinal plants as well as vast genetic resources as described by Soepadma (1979).

The Namdapha area, which falls within the Changlang and Lohit districts of Arunachal Pradesh and wedged between India, Myanmar and China, not only shows floristic affinity with these areas, but also with other parts of the country and far off places in the World. It is rather interesting to note that in spite of its territorial contiguity with its surrounding areas, it shows considerable endemism. It is therefore, imperative to conserve this area to preserve flora and fauna. The following are the summary of the justification for establishment of Biosphere Reserve in the proposed site with North - eastern India :

- 1/ The Namdapha is situated at the phytogeographically strategic point.
- 2/ More than 90% of primary forests of the core area are still virgin and rich in species diversity.
- 3/ Endowed with immense genetic resources, wild relative of cultivated plants as well as other economic and ethonobotanically significant plants.
- 4/ Large number of vascular plants are endemic to this area, besides a score of taxa belonging to lichens and Bryophytes. The area also has large number of species with disjunct or transspecific distribution. It is the richest store house of the terricolous lichens in India.
- 5/ The area also harbours the components of Bengalian rain forests, Burmese monsoon forests and Himalayan high altitude plants. Besides, taxa of other parts of the country as well as neighbouring and far off countries also grow profusely.
- 6/ The faunatic survey also shows the high frequency of the animals and their inter -- relationship with plants.
- 7/ A large number of taxa which have been reported rare, threatened and endemic to the other parts of North - eastern region are growing profusely in this area.
- 8/ Number of taxa viz., *Acer oblongum* Wallich ex DC. var. *serrulatum* Pax., *Aconitum lethale* Griffith, *Begonia aborensis* Dunn, *B. iridescens* Dunn, *Ceratostylis subulata* Blume, *Chirita mishmiensis* Debb. ex Biswas, *Cymbidium eburneum* Lindley var. *parishii* (Reichb. f.) Hook. f., *Euonymus glaber* Roxb., *Paravatia elliptica* (Hemsl.) Nayar & T.K. Paul, *Pauiia belledona* Deb & Dutta, *Phaius rubra* Lindley, *Prananthes scandens* (Hook. f. & Thomson) C.B. Clarke, *Pternopetalum senii* Deb & Dutta, *Rubus burkillii* Rolfe, *Symplocos pealii* King ex Das and *Wallichia triandra* (Joseph) S.K. Basu, etc. are endemic to this area and are found no where else in the world.
- 9/ Similarly, some animals especially avian fauna are also reported to be endemic to this region only.
- 10/ The ethnic groups, especially Lisus of Gandhigram and Vijohnagar area with very limited population are a source of many valuable informations regarding the usefulness of many unknown species.
- 11/ Impact of tourism is practically nil at present.
- 12/ Politically the proposed Nature Reserve area falls in the State of Arunachal Pradesh only and the management would not be difficult from the administrative point of view.

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