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REPORT ON A BOTANICAL TOUR
TO BOMDI-LA, N. E. F. A.
(May, 1955)

By

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Figs. 1-3. Fig. 1, (top left) *Rhododendron niveum* Hk. f. Fig. 2, (top right) *Rhododendron arboreum* Sm.
Fig. 3, (bottom) *Rhododendron griffithianum* Wight.

REPORT ON A BOTANICAL TOUR TO BOMDI-LA, N.E.F.A.

INTRODUCTION.

The flora of the Eastern Himalayas, particularly of the regions of the Nepal and the Sikkim Himalayas, and that of the Khasia and Jaintia Hills in Assam, is fairly well known, mainly due to the strenuous and concerted efforts of such eminent botanists as Dr. Nathaniel Wallich, Sir Joseph Hooker, Sir George King, Sir David Prain, R. Pantling, I. H. Burkill and a few others. Very little information, however, is available of the botany of the North East Frontier Agencies (NEFA), particularly of the Kameng Division. The great value that can naturally be derived of the knowledge obtained from the flora of these hitherto unexplored Frontier Tracts was fully appreciated by our most beloved and highly esteemed Prime Minister and H. E. the Governor of Assam. They suggested, therefore, that preliminary botanical excursions be conducted in these regions to assess their potential natural wealth with a view to undertake detailed and intensive explorations at later stages for possible commercial exploitations by the State.

Under very favourable auspices, therefore, it was jointly decided by the Government of India and the Government of Assam that a botanical tour be undertaken to Bomdi-la, the headquarters of the Kameng Frontier Division of NEFA, by the Botanical Survey of India. Necessary permission was also accorded for a small party of five persons from the Industrial Section of the Indian Museum, Botanical Survey of India to visit the place for the collection of specimens from that area.

The party consisted of Shri K. S. Srinivasan, the Curator, Shri A. Basu, the Gallery Assistant, Shri B. P. Roy Chowdhury, the Artist, Shri S. Mondal, the Herbarium Duftry and Sri Baikunthanath Das, the Bearer. The visit to Bomdi-la was scheduled to be in the month of May, 1955.

Preparations

Pressure of time and difficulties in obtaining the necessary camp and field equipment, became the limiting factors of our expedition. It was only through the generous help of the Political Adviser, NEFA, that these difficulties could be surmounted in time and our thanks are due to him. H. E. the Governor of Assam gave our expedition every encouragement, for which we are most grateful.

Description of the Journey

We left Calcutta by Train on the morning of the 3rd May, 1955, reaching Rangapara North on the night of the 5th May at 9 p.m. The Assam Government had kindly

with dry aspects rather prominent. Many of the tall towering trees in the former areas were covered with a thick coat of leafy Jungermanniales, mosses and lichens, good indications of tropical monsoon forest types. Tree-ferns are not uncommon here and there in some of these forests. Beyond Sisini, *Pinus excelsa* Wall, is a gregarious tree, practically throughout, towering in slopes and ravines and standing picturesquely in more or less exposed forests. Generally, it was noticed that many of the areas of these forests were strikingly poor in the undergrowth or ground-cover, which is usually a characteristic of the tropical Rain-forest types. Again the large lianes and scramblers that one would normally expect were found to be rather scarce; in very favourable areas, especially about Bomdi-la and Bampu-la, bamboos and reeds were flourishing in extensive stretches, where *Chimonobambusa callosa* Nakai, was noted as the dominant form. Epiphytes were found to be surprisingly poor, even though we examined several huge felled tree-tops for possible epiphytes. Except for a few species of orchids and polypodiaceous ferns we did not come across those interesting forms that one normally expects to see in such forests. Possibly the time of our visit was not quite the best season for a rich and varied botanical harvest; we were led to this conclusion by the fact that most plants were only in leaf and in places large barren areas were in evidence. Further, in many areas of the district there has been much deforestation, and this has naturally brought in many changes particularly in herbaceous and low shrubby elements.

The outskirts of the forests, especially between Foot-hills and Sisini, consist of shrubby vegetation. *Mussaenda frondosa* Linn., with its very characteristic large white clayx-leaf, and *Solanum torvum* Swartz, deserve mention here. Species of *Curcuma* and *Arisaema* are also frequent as smaller herbaceous forms, the former sometimes covering larger areas. In more or less wet and shady situations throughout the region covered by us, we met with *Begonia laciniata* Roxb, a very profuse flowering herb in certain areas. In similar wet and shady situations, *Impatiens radiata* Hk.f. and occasionally *Geranium nepalense* Sweet were seen, though not as common as *Begonia laciniata* Roxb. *Commelina obliqua* Ham. with its attractively coloured leaves and bracts is common as a rambling or nearly climbing herbaceous plant in many moist situations; there, too, *Streptolirion volubile* Edgew, was also frequent. Rock cuttings with plenty of moisture and shade especially at Sisini harboured extensive patches of liverworts and club-mosses among which *Marchantia polymorpha* Linn., *Targionia hypophylla* Linn. and *Selaginella caulescens* Spreng. were common. *Dumortiera hirsuta* Reinw. was characteristic of the places where there was a gentle and constant flow or dripping of water. The liverworts were all found fruiting and in some cases in well advanced stages.

The forests themselves are composed of trees of varying height; some are lofty and attain 100 to 150 ft. in height. Among such trees are to be mentioned *Pinus excelsa* Wall., *Tsuga brunoniana* Carr, *Taxus baccata* Linn. and *Michelia excelsa* Blume. *Betula cylindrostachys* Wall. is also a very characteristic large tree of these forests, though found to be smaller in height than the conifers just mentioned.

Among the trees between 30 to 50 ft. high may be mentioned *Prunus nepalensis* Ser., *Cornus macrophylla* Wall., *Rhododendron griffithianum* Wight. *Rhododendron falconeri* Hook. *Acer hookeri* Miq., and *Acer campbellii* Hook. Species of *Rhododendron*,

Daphniphyllum himalayense Muell., *Maesa indica* Wall. *Cinnamomum* sp. constitute the small trees or larger shrubs of these forests.

The forests consist of an admixture of the Evergreen and Deciduous trees, the dominance of one or the other type characterising the particular aspect of the forest in a particular area. The following are some of the Evergreen trees observed :

Pinus excelsa Wall.
Tsuga brunoniana Carr.
Taxus baccata Linn.
Betula cylindrostachys Wall.
Quercus lamellosa Smith.
Pasania spicata (Smith). Oerst.
Daphniphyllum himalayense Muell.
Machilus kurzii King.
Maesa indica Wall.
Prunus nepalensis Ser.
Cornus macrophylla Wall.
Rhododendron griffithianum Wight.
Rhododendron falconeri Hook.
Rhododendron arboreum Sm.
Cinnamomum sp.
Ilex dipyrena Wall.

The following are some of the Deciduous trees :

Acer campbellii Hk. f. & T.
Acer hookeri Miq.
Michelia excelsa Blume.
Albizia stipulata Boiv.
Machilus odoratissima Nees.
Quercus griffithii Hook.

Among the large woody climbers are to be mentioned :

Holboellia latifolia Wall.
Clematis buchananiana DC.
Capparis multiflora Hk.f. & T.
Entada phaseoloides Linn.

Parthenocissus himalayana (Laws.) Planch was not uncommon, sometimes covering with its foilage the large trees over which it climbs.

Zanthoxylum oxyphyllum Edgew. and species of *Smilax* form the prickly climbing shrubs in these forests. *Jasminum dispernum* Wall. and *Jasminum grandiflorum* Linn. are also common as climbing plants.

In many places, the forests are more or less of the open type, with interrupted canopy and sparsely distributed large trees, permitting plenty of light to penetrate through. The undergrowth vegetation in such areas was also poor. But in favourable areas, a dense vegetation of under-shrubs was common. *Strobilanthes agrestis* Clarke and *Plectranthus* sp. are the dominant species in certain localities. In cool and shady

places, *Ajuga macrosperma* Wall., *Urtica parviflora* Roxb., *Lecanthus wightii* Wedd. and *Pilea symmeria* Wedd. were noticed. *Urtica parviflora* Roxb., *Pilea symmeria* Wedd. and *Amarantus gangeticus* Linn. were also noticed in the undergrowth near water courses; occasionally *Disporum pullum* Salisb. was noticed forming small thickets, with bunches of beautiful white flowers. *Equisetum diffusum* D. Don., though rare, was seen in crevices and sheltered places on the banks of mountain river courses.

In comparatively open areas, on dry ground, exposed to the full blaze of the sun, the following plants formed special communities:

- Elsholtzia strobilifera* Benth.
- Rumex hastatus* D. Don.
- Crepis silhetensis* Hk.f.
- Gnaphalium luteo-album* Linn.
var. *multiceps*. (Wall. ex DC.) Hk.f.
- Anaphalis cinnamomea* Clarke.
- Anaphalis araneosa* DC.
- Conyza japonica* Less.
- Bidens biternata* (Lour) Merr. & Sherff.

Sonchus oleraceus Linn., *Sonchus arvensis* Linn., *Gerbera piloselloides* Cass., *Gynura pseudo-china* DC. and *Senecio densiflorus* Wall. though occasional in similar dry localities, preferred slightly shady situations. *Pteridium aquilinum* (L) Kuhn. was noticed in nearly pure stands in very arid situations, in the neighbourhood of certain villages between Jabrang and Rupa.

It must, however, be mentioned here that the shrubby belts which came next to trees, were not clearly defined, for such belts contained also some trees of larger sizes. Similarly the bushy regions in several places also contained vacant spaces with stumps of dead trees, and the soil in such situations was practically barren; we cannot assign the real cause for such a condition, but the appearances were very striking and typical.

Nothing can exceed the richness and elegance of the varieties of *Rhododendrons* which displayed a profusion of splendid blossoms (Figs. 1—3). The red and purplish flowered species certainly are very pretty and ornamental. We first encountered *Rhododendrons* in large numbers while on our march from Sisini to Jabrang, particularly when within 3 to 4 miles from Jabrang. The forests were at first mixed. Gradually *Rhododendrons* prevailed until we were almost entirely surrounded by them. At the time of our visit, most of the *Rhododendron* trees were in full blossom. In several places, the forest floor was covered with a carpet of the flowers that had dropped down. *Rhododendron* forests extended beyond Jabrang for about 3 miles in the direction of Rupa. The dense heads of red or pink or white flowers give a delightful and colourful touch to the otherwise dull and monotonous scenery of these forests at that season. Beyond this belt, the *Rhododendrons* disappear, except for a few trees scattered, which in their isolation were not very impressive. At Bomdi-la, however, and in the forests about it, *Rhododendrons* came up again in large numbers.

Rhododendron niveum Hook. (Fig. 1) is perhaps the more widely distributed species in the area, together with *Rhododendron grande* Wight and *Rhododendron arboreum* Sm.

(Fig. 2). These species adorn the forests with their blossoms occurring as many-flowered dense heads, usually red or pink. *Rhododendron dalhousiae* Hook., *Rhododendron griffithianum* Wight. (Fig. 3) and *Rhododendron falconeri* Hook. bear larger flowers, which are white or with shades of light green or pink. The flowers are very fragrant.

The following are the species of *Rhododendron* we came across in these forests:

Rhododendron vaccinioides Hook.
Rhododendron grande Wight.
Rhododendron falconeri Hook.
Rhododendron arboreum Sm.
Rhododendron niveum Hook.
Rhododendron griffithianum Wight.
Rhododendron edgeworthii Hook.
Rhododendron dalhousiae Hook.

Amid the striking flowers that enliven these forests, those of orchids (Figs. 4—7) deserve particular mention. As far as we could notice, two zones seem particularly well suited for the production of orchids, viz., the forests about Sisini and those about Bomdi-la. Of the species encountered by us, *Dendrobium nobile* Lindl. (Fig. 4) is decidedly the most elegant and attractive orchid with heavy bunches of beautiful flowers. This orchid was seen in favourable situations, especially on the way to Bomdi-la from Rupa, in large patches, perched on rocky cliffs, on thick mossy carpets. Another interesting, though not very attractive orchid, met by us is *Galeola falconeri* Hook. (Fig. 18). We collected two impressive specimens of the entire plant at Sisini, both specimens were large ones, the root-stock of which being as thick as a man's wrist, with their stems easily attaining a height of 5 to 5½ feet. *Bulbophyllum collettii* King & Prantl. is yet another interesting find in these forests.

The following are the species of orchids noticed during this tour:

Dendrobium nobile Lindl.
Dendrobium dalhousieanum Wall.
Bulbophyllum griffithii Reichb.
Bulbophyllum collettii King & Prantl.
Cirrhopetalum brevipes Hook. f.
Eria graminifolia Lindl.
Coelogyne corymbosa Lindl.
Otochilus alba Lindl.
Calanthe chloroleuca Lindl.
Stauroopsis undulatus Benth.
Galeola falconeri Hook.
Paphiopedilum insigne (Wall.) Pfitz.
Ritaia himalaica King & Prantl.

It struck us that the season was not perhaps favourable for a large number of epiphytic and ground orchids to be represented in these forests. A proper appreciation of the orchid wealth of these forests can be had only when extensive searches are

made, all through the year, and at proper times. However, one thing impressed us, that the Nepal Himalayas, particularly in the vicinity of Kakani, presented very favourable spots for a very vast assemblage of orchids, some species of which are so abundant as to form conspicuous "forests", strikingly beautiful and wonderful. The Sikkim Himalayas, and the Khasia and Jaintia Hills in Assam are also noted for their orchid wealth. Being so, the NEFA region, contiguous to these territories, can be expected to harbour several more species than what was presented to us during the season of our visit to the place. Repeated attempts to discover the species therein are expected to yield very encouraging results.

Even with only a preliminary acquaintance with the forests of the Kameng Division, NEFA, we find that the flora of the area is botanically and economically interesting. This report is not aimed at giving a detailed account of these aspects, but a few sketchy notes are necessary even though not exhaustive.

Economic aspect

1. Timber Trees

The Timber Wealth of these forests is appreciable. A large number of trees of known economic value flourish in these forests. Among those that are of value for building and construction purposes, and for the making of doors and window frames and the like articles, are to be mentioned:

Michelia excelsa Blume.
Pinus excelsa Wall.
Viburnum erubescens Wall.
Engelhardtia spicata Blume.
Pasania spicata (Smith). Oerst.
Quercus lamellosa Smith.
Quercus griffithii Hook.
Lindera sp.
Machilus odoratissima Nees.
Machilus kurzii King.

and where much quality and fine workmanship is not required *Maesa indica* Wall, and *Rhododendron arboreum* Sm. The following are valuable for planking purposes also:

Michelia excelsa Blume.
Pinus excelsa Wall.
Acer campbellii Hk.f. & T.
Alibizzia stipulata Boiv.
Lindera sp.
Machilus kurzii King.
Engelhardtia spicata Blume.
Daphniphyllum himalayense Muell.
Prunus nepalensis Ser.

For furniture and cabinet work, *Michelia excelsa* Blume, *Taxus baccata* Linn., and to a certain extent *Alibizzia stipulata* Boiv. offer good timbers. *Acer hookeri* Miq.,



Fig., 4. *Dendrobium nobile* Lindl.

Engelhardtia spicata Blume, *Rhododendron falconeri* Hook., *Rhododendron arboreum* Sm., *Vaccinum nummularia* Hk.f. & T. yield useful wood for making different kinds of utensils as spoons, laddles, plates and the like. For packing purposes and making of tea-boxes, *Acer campbellii* Hk.f. & T., *Engelhardtia spicata* Blume, *Machilus odoratissimus* Nees and *Albizzia stipulata* Boiv. can be advantageously used. *Pinus excelsa* Blume, *Viburnum erubescens* Wall., *Vaccinum nummularia* Hk.f. & T. and *Daphniphyllum himalayense* Muell. afford very good wood for carving purposes; for agricultural implements, dug-outs and turneries, *Quercus griffithii* Hook., *Pinus excelsa* Blume, *Taxus baccata*, Linn., *Albizzia stipulata* Boiv. yield good timbers; *Cornus macrophylla* Wall. is known to yield very good charcoal for gun-powder, and *Betula cylindrostachys* Wall. quality charcoal, considered best for locomotive purposes.

We saw an Industrial school run at Bomdi-la where we noticed Chap or Champa or Phul champa (*Michelia excelsa* Blume) and Jangli Akhrot (*Daphniphyllum himalayense* Muell.) used for furniture making, long-ching (*Pinus excelsa* Blume) for door and window frames and making platforms; Yearga (*Elaeocarpus varunua* Ham.) for wooden utensils such as spoons, plates, ash-trays, etc. For rough type of work Chipsing (*Cinnamomum* sp.) is often used.

The utility of the various timber trees of the forests is known to the local inhabitants of the place, as is well evidenced by the information which they were able to furnish us at our instance. According to the local information, the following are some of the valuable timber trees:

- Karsing (*Acer hookeri* Miq.),
- Sim sing Meto (*Vaccinum nummularia* Hk.f. & T.),
- Shersumpasing (*Ribes glaciale* Wall.),
- Jamkarmesing (*Lindera* sp.),
- Akhrot or Okhar (*Daphniphyllum himalayense* Muell.),
- Kauloh or
Maseh kauloh } (*Machilus kurzii* King.),
- Safed kauloh (*Machilus odoratissimus* Nees),
- Kapashi (*Acer campbellii* Hk.f. & T.),
- Phul champ (*Michelia excelsa* Bl., also *Machilus* sp.),
- Ranee champ (*Daphniphyllum himalayense* Muell), also
called by some as Okhar.
- Bajrant (*Quercus*).
- Aroopatty (*Prunus nepalensis* Ser).

2. Bamboos

The stretches of Bamboo forests in several areas offer yet another very valuable economic forest product. Different kinds of bamboos are largely employed in the Frontier Tracts for construction of living sheds, houses and camps, where the roofing, floor coverings, partition walls and enclosures are all done by split-bamboos and reeds plaited together.

3. Medicinal plants

The forests are also rich in several plant species of medicinal value. We collected some such medicinal plants, among which mention may be made of:

Berberis aristata DC.,
Plantago major Linn.,
Zanthoxylum oxyphyllum Edgew.,
Curculigo orchioides Gaertn.,
Valeriana hardwickii Wall.,
Lycopodium clavatum Linn.,
Drynaria quercifolia J. Smith.

Maesa indica Wall. occurs in places as dense vegetation, the leaves of which are well-known fish-poison. *Taxus baccata* Linn. is also an important medicinal species; the leaves of this tree contain volatile oils, tannic acid and gallic acids, and the leaves and fruits are medicinal and very poisonous to cattle. Several Liliaceous plants are known to be poisonous; the genus *Paris* is one of such poisonous plants. *Paris polyphylla* Sm. grows in these forests, and its medicinal properties can be explored. *Aconitum palmatum* D. Don. is seen in the NEFA area; though this particular Aconite has not gained recognition in Pharmacopoeias, the local people claim medicinal virtues for this species also, popularly known to them as Boa carpo. *Equisetum debile* Roxb. is a known medicinal plant, and is administered as a cooling medicine in Punjab; it is given in Gonorrhœa. *Equisetum diffusum* D. Don. noticed in these parts deserves investigation. *Coriaria nepalensis* Wall. is another species the leaves and seeds of which are poisonous.

4. Other economic plants

There are several other probable economic species also in these forests. Only a few of them are indicated here. The Fumitory (species of *Corydalis*) deserves mention here. *Corydalis tuberosa* and *Corydalis fabaceae* are officinal in Europe; their bitter acid roots are used as external application in indolent tumours; the chemical properties of the bitter roots are analogous to those of Morphia and Anarcotine. The Fumitory is well represented in Kashmir area, where at least 12 species are known, and some of them extend upto Sikkim. *Corydalis govaniana* Wall. from N.W. Himalayas and near Simla, is used as a tonic and anti-periodic. *Corydalis ramosa* Wall. occurring in the Kurram Valley in the Himalayas is also employed medicinally by the natives in the treatment of eye-diseases. *Corydalis formosa* roots are considered to be tonic, diuretic and alternative. In NEFA we came across *Corydalis leptocarpa* Hk.f. & T. (Fig. 16). In consideration of the medicinal values of the several species of this genus, the local species deserves attention.

The Ivy (*Hedera nepalensis* Koch) was at one time highly valued in medicine. This species is common with other species of Araliaceae in these forests, such as *Aralia pseudo-ginseng* Benth., *Macropanax oreophilum* Miq. and others. These would also offer potential source of economic species. Similarly, the Gentians, which generally have bitter stems and roots and many species of which are of considerable medicinal value deserve exploitation. *Gentiana quadrifaria* Blume. (Fig. 29) is the species we came

across in this belt. So also the medicinal properties of *Lobelia pyramidalis* Wall., *Myrsine semiserrata* Wall. occurring in these parts, may be investigated. *Artemisia vulgaris* Linn. (Fig. 11) and *Cannabis sativa* Linn. (Fig. 38) which grow in a wild stage can be brought under systematic and extensive cultivation for their medicinal properties. *Andromeda elliptica* Sieb & Zucc. is another plant deserving consideration as also *Aristolochia saccata* Wall. The young leaves and buds of *Andromeda elliptica* Sieb & Zucc. (Fig. 21) are known to be poisonous, which property renders them useful as an insecticide.

Just as there are a good many medicinal plants, these forests also possess a number of dye and tan yielding species, such as *Berberis aristata* DC. (Fig. 12), *Coriaria nepalensis* Wall., *Symplocos theaeifolia* Buch. Ham. ex. D. Don., *Geranium nepalense* Sw. (Fig. 14), *Rubia cordifolia* Linn. (Fig. 15), *Engelhardtia spicata* Blume, *Taxus baccata* Linn., etc. Several species of *Galium* also yield a dye, and in Europe it is known that the species *Galium verum* Linn. is extensively collected for its roots which yield a dye. *Galium mollugo* Linn. (Fig. 31) and *Galium triflorum* Mich. are seen in these forests, the economic aspects of which would seem merit consideration.

Valeriana hardwickii Wall. (Fig. 9) and *Valeriana wallichii* DC. (Fig. 10) yield roots of interest for perfumery and when dry can be used as incense. So also, *Taxus baccata* Linn. yields a gummy exudation which can constitute an incense.

There are oil-yielding plants, among which *Camellia drupifera* Lour (Fig. 20) may be referred to for possible exploitation. It has long ago been reported that this species would seem worthy of attention as an oil-seed bearing species, as it yields a non-drying oil of superior quality, and which is also known to be used medicinally in Cochin-China. Another species deserving attention is *Brassica napus* Linn. a species growing wild in NEFA. This species is known to be intensively cultivated in Japan for the valuable oil-seeds it yields. *Taxus baccata* Linn. the Yew, is also of value for the volatile oil its leaves contain. *Cornus macrophylla* Wall. is another species, which may deserve attention. *Cornus sanguinea* Linn. and *Cornus mascula* Linn. yield valuable commercial oils, a fact which would seem to suggest that the local species be also examined for probable oils of economic value. So also, the Thistles may be examined; species of *Cnicus*, especially *Cnicus arvensis* yields large quantities of oil from the tiny seeds. *Cnicus argyranthus* DC. and *Cnicus khasianus* Clarke were collected by us from these areas, and these species should be investigated. For brevity sake, we do not propose to dilate any further on other well-known oil-yielding plants.

There are other plants that give economic products; mention may be made of plants yielding food-stuffs, spices (*Cinnamomum tamala*, Nees & Ebr. the Lavanga), gums and resins (*Pinus excelsa* Bl., *Taxus baccata* Linn. *Albizia stipulata* Boiv), fibres (*Urtica parviflora* Roxb., *Pilea symmeria* Wedd.), turpentine, etc. (*Tsuga brunoniana* Carr., *Pinus excelsa* Bl.).

5. Ornamental plants

Such a brief survey of the economic plants of this area would be incomplete if some of the highly ornamental shrubs were left out. Many of them are great favourites

with gardeners ; others should be introduced into our gardens. *Deutzia staminea* Br. (Fig. 22) and *Spiraea bella* Sims. are among the finest ; many of the orchids that grow in these forests would soon be in great esteem if they were properly known.

Among other less important, yet interesting species, mention should be made of *Begonia laciniata* Roxb., a succulent herb of moist situations, common throughout these forests. It is claimed that the juice of this species as also of other species of the same genus is poisonous to leeches and may be used to kill them. We did not, however, have an opportunity to test the efficacy of this property of this interesting herb.

6. Phytogeographical notes

The flora of Kameng Division proved of considerable botanical interest from the phytogeographical and distribution point of view. In these tracks, we found several species, which are not mentioned in Hooker's Flora of British India, and among such plants we would mention *Cayratia japonica* (Thunb.) Gagnep., *Cnicus khasianus* Clarke, *Erechthites valerianaefolia* DC., *Wahlenbergia prainiana* Watt., *Ritaia himalaica* King and Prantl., *Chimonobambusa callosa* Nakai. We also noticed with interest that species, supposed to be restricted in habitat and confined to only a particular locality, are now extending into the North East Frontier Agencies. In this, we would make particular mention of *Enkianthus deflexus* Sehn and *Bulbophyllum collettii* King & Prantl. In other cases plants said to range from Bhutan or Sikkim towards the west in the Himalayas, were noticed in NEFA, much further east than as hitherto known. From these purely scientific aspects, the flora of NEFA proved of great interest to us.

Conclusion

In spite of our misfortunes, our stay at Bomdi-la was not without pleasant experiences. We had much amusement when the droning air-craft, at scheduled times hovered round the hilly terrain of Bomdi-la, and came to the rescue of the officials and employees of the place, with provisions, vegetables and other food articles, which were dropped with or without parachutes. On two days during our stay at Bomdi-la we witnessed these operations, which as they amused the visitors, they made the inhabitants of the place rejoice with a sense of great relief, as they could look to the "heavens" for their food to "descend". Some of the members of the party had also an opportunity to witness the "Posa Payment Celebrations" held at Bomdi-la, which was picturesque.

In concluding, it is our hope that even the very meagre information we at present possess of the Botany of NEFA will justify this account, however sketchy it may be ; being presented to the Government of India, we do hope it will be of interest and value.

A systematic enumeration of the species collected, and a synopsis of the collections determined are also appended to this report.

Finally, I would be failing in my duties, if I did not place on record my deep sense of gratitude to the various officials of NEFA administration and Government of Assam. To the Government of India and the Government of Assam, I am grateful for the opportunity given to visit the place. I am indebted to Capt. Har Mandar Singh, Political Adviser

to the Governor of Assam, for the help and advice he gave us ; to Mr. R. S. Nag, Political Officer, Kameng Frontier Division, Bomdi-la, one of the most amiable and liberal of men we came across in the tour, and whose enthusiasm and interest was really most encouraging ; to Shri T. A. Imti. the Assistant Political Officer, for his ready willingness to help in all our efforts and looking after our comforts while on our botanical mission to Bomdi-la ; to the Superintendent, Indian Botanic Gardens, Sibpur, for help in the determination of the species and to Rev. Fr. Dr. H. Santapau, S.J., for the valuable advice and encouragement he gave throughout as Chief Botanist of the Botanical Survey of India, and for his kind criticism of this report.

CALCUTTA:

The 24th April 1956.

K. S. SRINIVASAN,

Curator,

*Industrial Section, Indian Museum,
Calcutta.*



Figs. 5-7. Fig. 5, (right) *Stawopsis undulatus* Benth. Fig. 6, (middle) *Coelogyne corymbosa* Lindl.
Fig. 7, (left) *Dendrobium dalhousieanum* Wall.

Systematic enumeration of the species collected.

Ranunculaceae

<i>Clematis buchananiana</i> DC.	
Bomdi-la (NEFA), over 8000 ft. altitude	18-5-1955
<i>Clematis buchananiana</i> DC. var. <i>rugosa</i>	
Bomdi-la	13-5-1955
<i>Ranunculus diffusus</i> DC.	
Bomdi-la	12-5-1955
<i>Aconitum palmatum</i> D. Don.	
Bomdi-la	13-5-1955
Known locally as Boa Carpo and is considered as a remedy against fevers.	

Magnoliaceae

<i>Illicium manipurense</i> Watt. ex King.	
Bomdi-la	12-5-1955
<i>Michelia excelsa</i> Blume	
Bomdi-la	16-5-1955
A very valuable timber tree seen in many forests in NEFA.	

Berberidaceae

<i>Holboellia latifolia</i> Wall.	
Bomdi-la	14-5-1955
<i>Mahonia nepaulensis</i> DC.	
On the way from Sisini to Jabrang	7-5-1955
<i>Berberis aristata</i> DC.	
Rupa	9-5-1955
<i>Berberis insignis</i> Hk.f. & T.	
Bomdi-la	14-5-1955
The occurrence of this species at NEFA gives it an extended distribution in the Eastern Himalayas, where it has so far been reported from E. Nepal, Sikkim and Bhutan.	

Fumariaceae

<i>Dactylicapnos scandens</i> (Walp.) Hutchin.	
Bomdi-la	16-5-1955
<i>Corydalis leptocarpa</i> Hk.f. & T.	
Bomdi-la	12-5-1955

Cruciferae*Cardamine hirsuta* Linn.

- Bomdi-la 14-5-1955
 The plants were noticed in flowering and fruiting stages.

Brassica napus Linn.

- Bomdi-la 13-5-1955
 This species which is reported to be grown as an oil-seed crop in Japan, is found to grow in a wild state in the NEFA also. The cultivation of this species in this country would seem merit consideration for the oil the seeds yield.

Capparidaceae*Capparis multiflora* Hk.f. & T.

- Sisini 6-5-1955
 This large woody and somewhat thorny climber, grows climbing on larger trees in the thick forests at Sisini. In the month of May, the plants were seen in full blossom.

Violaceae*Viola hookeri* T. Thoms.

- Bomdi-la 13-5-1955
 Flowering.

Viola distans Wall.

- On rock cuttings and slopes of hills, all along the way from Sisini to Jabrang. 7-5-1955
 Flowering.

Polygalaceae*Polygala sibirica* Linn.

- Rupa 9-5-1955
 On dry and very exposed areas. Flowering.

Caryophyllaceae*Cerastium vulgatum* Linn.

- Rupa 9-5-1955
 On extremely xerophytic conditions, growing more or less as sub-erect plants. Flowering.

Drymaria cordata Willd.

- Bomdi-la 14-5-1955
 At NEFA, it is gathered at an altitude above 8500 ft. which is of interest. This species has been claimed as useful as ground-cover for preventing soil erosion, particularly on steep slopes. The plants were noticed bearing tiny flowers during the season.

Hypericaceae*Hypericum hookerianum* W. & A.

- Bomdi-la (NEFA) 13-5-1955
 Locally this species is known as Ong Buja, and the local people of the hills claim that it is used as a tea-substitute.

Ternstroemiaceae*Pyrenaria barringtoniaefolia* Seem.

On the way from Sisini to Jabrang 7-5-1955

Camellia sinensis (Linn.) O. Kuntze.

Bomdi-la 18-5-1955

Grows in a wild state in the forests about Bomdi-la at higher elevations.

Camellia drupifera Lour.

Bomdi-la 18-5-1955

Malvaceae*Malva verticillata* Linn.

Rupa 9-5-1956

The leaves and tender shoots are boiled and eaten as spinach with rice.

Tiliaceae*Elaeocarpus lanceaefolius* Roxb.

Bomdi-la 16-5-1955

Elaeocarpus sp. (*varunua* Ham.?).

Bomdi-la 18-5-1955

Geraniaceae*Geranium nepalense* Sweet.

On the way from Rupa to Bomdi-la 19-5-1955

The root yields a red colouring matter, used to colour medicinal oils.

Impatiens tripetala Roxb.

Sisini 6-5-1955

Impatiens radiata Hk.f.

On the way from Rupa to Bomdi-la 10-5-1955

Rutaceae*Zanthoxylum oxyphyllum* Edgew.

Bomdi-la 16-5-1955

Skimmia laureola Hk.f.

Bomdi-la 18-5-1955

Meliaceae*Munronia* sp.

Bomdi-la 13-5-1955

Ilicaceae*Ilex dipyrena* Wall.

Bomdi-la 14-5-1955

Ilex godajam Colebr.

Bomdi-la 11-5-1955

Celastraceae

- Euonymus bullatus* Wall.
 Bomdi-la 18-5-1955
- Euonymus frigidus* Wall. var. *elongatus*.
 Bomdi-la 13/14-5-1955
- Euonymus griffithii* Kurz.
 Bomdi-la 12-5-1955
- Euonymus theaeifolius* Wall.
 Between Bomdi-la and Rupa. Flowering 19-5-1955
- Euonymus* sp.
 Between Bomdi-la and Rupa 10-5-1955

Vitaceae

- Parthenocissus himalayana* (Laws.) Planch.
 Bomdi-la 18-5-1955
- Tetrastigma serrulatum* Planch.
 On the way between Rupa and Bomdi-la 10-5-1955
- Cayratia japonica* (Thunb.) Gagnep.
 Sisini 6-5-1955
 This is a new record ; the plant is not mentioned in Hooker's Flora of British India.

Sapindaceae

- Acer hookeri* Miq.
 Bomdi-la 13-5-1955
 This is known locally as Karsing. The wood is used locally for making wooden utensils.
- Acer campbellii* Hk.f. & T.
 Bomdi-la 16-5-1955
 Flowering. It is known locally as Kapashi. It is a very useful timber tree for planks and making tea-boxes. It is also used as fodder for cattle.
- Turpinia pomifera* DC.(?)
 Bomdi-la 16-5-1955

Sabiaceae

- Meliosma pungens* Wall.
 Bomdi-la 16-5-1955

Coriariaceae

- Coriaria nepalensis* Wall.
 Rupa 9-5-1955
 Flowering and fruiting profusely during the season. The plant is known to be one of the food plants of silk-moth. It is also valuable as a tan-yielding plant.

Leguminosae*Desmodium ramosum* Lindl.

Bomdi-la 12-5-1955
 This species is not referred to in Hooker's Flora of British India.

Entada phaseoloides Linn.

Beyond Sisini, on the way to Jabrang (Bompula camp) 7-5-1955
 A few stragglers were noticed with flowers.

Indigofera dosua Ham.

Rupa 9-5-1955
 On very dry mountain slopes in quite exposed places, sometimes associated with
Pteridium aquilinum (L.) Kuhn. Flowering and fruiting during the season.

Albizia stipulata Boiv.

Rupa 19-5-1955
 I met with a tree in beautiful blossom, growing on the gravelly bank of the river
 Rupa-Narain at Rupa. The wood is useful for making tea-boxes and packing
 cases. Also used for planking and dug-outs, well-curbs, turnery articles, etc.
 The gum of the tree is also useful for sizing paper.

Rosaceae*Prunus nepalensis* Ser.

Bomdi-la 17-5-1955
 This plant is known locally by the name Aroopaty. According to the local people
 the leaves when eaten by cattle, prove fatal. The wood is said to be used for
 planks.

Prunus sp.

Bomdi-la 13-5-1955

Spiraea bella Sims.

Bomdi-la 12-5-1955

Spiraea sp.

Bomdi-la 12-5-1955

Neillia rubiflora D. Don.

Bomdi-la 13-5-1955

Rubus calycinus Wall.

Bomdi-la 12-5-1955

Rubus paniculatus Sm.

Bomdi-la 12-5-1955
 The fruits are stated to be edible, though insipid in flavour.

Rubus alpestris Blume.

Jabrang 8-5-1955
 The plant is known locally by the name Charchoreh, and is a fibre-yielding plant
 for making ropes.

<i>Rubus lineatus</i> Reinw.		
Bomdi-la		13-5-1955
The fruits are edible. Locally known as Singnonmoon.		
<i>Rubus macilentus</i> Camb.		
On the way from Rupa to Bomdi-la		10-5-1955
<i>Rubus ellipticus</i> Smith.		
Rupa		9-5-1955
The fruit is edible and has the flavour of rasp-berry and considered to be one of the best wild fruits. Fruiting and flowering.		
<i>Rubus biflorus</i> Ham.		
Bomdi-la		12-5-1955
Flowering. Fruit is edible.		
<i>Rubus rosaeifolius</i> Smith.		
Between Rupa and Bomdi-la		10-5-1955
Flowering. The fruit is edible.		
<i>Fragaria indica</i> Andr.		
Bomdi-la		14-5-1955
The plant was collected above 8500 ft. altitude. Watt reports that the indigenous straw-berry yields abundantly a very insipid fruit which, however, can be much improved by cultivation.		
<i>Potentilla fulgens</i> Wall.		
Bomdi-la		14-5-1955
<i>Potentilla kleiniana</i> Wight.		
Between Rupa and Bomdi-la		10-5-1955
<i>Docynia</i> sp.		
Bomdi-la		14-5-1955
<i>Eriobotrya petiolata</i> Hk.f.		
Bomdi-la		16-5-1955
<i>Pyrus pashia</i> Ham.		
Rupa		19-5-1955
Fruiting		
<i>Pyrus microphylla</i> Wall.		
Bomdi-la		13-5-1955
<i>Photinia integrifolia</i> Lindl.		
Bomdi-la		12-5-1955
Flowering heavily.		
<i>Pourthiaea arguta</i> Dcne.		
Bomdi-la		18-5-1955
Hooker reports this species from Khasia mountains, Sikkim Terai & Burma. The occurrence of this species in NEFA gives it a wider distribution.		

Saxifragaceae*Astilbe rivularis* Ham.

Bomdi-la 12-5-1955

Astilbe sp.

Rupa 9-5-1955

Chrysosplenium nepalense D. Don.

Bomdi-la 13-5-1955

Dichroa febrifuga Lour.

On the way between Rupa and Bomdi-la 10-5-1955

The plant is locally known as Goorbishah. The plant has medicinal properties.
[The roots and leafy tops are employed for treatment of malarial fevers.]

Deutzia staminea Br.

Rupa 9-5-1955

Flowering.

Ribes glaciale Wall.

Bomdi-la 13-5-1955

Hooker mentions for the distribution of this species, Kashmir to Bhutan in temperate and alpine Himalayas. It is seen in NEFA also, east of Bhutan.

Hamamelidaceae*Corylopsis himalayana* Griff.

Jabrang 8-5-1955

Lythraceae*Punica granatum* Linn.

Rupa 13-5-1955

In some of the Bhutia villages, near about and at Rupa, the pomegranate is seen grown in their gardens. The plants were all found to be not quite healthy.

Cucurbitaceae*Thladiantha dubia* Bunge.

Sisini 6-5-1955

Begoniaceae*Begonia laciniata* Roxb.

Between Sisini and Jabrang and near about Bomdi-la 7-5-1955

In most of the shady and moist situations, this species is seen growing abundantly and in flowering, sometimes covering large areas on slopes.

Umbelliferae

- Sanicula europea* Linn.
Rupa 9-5-1955
- Chaerophyllum* sp.
Between Rupa and Bomdi-la 10-5-1955
- Oenanthe thomsoni* C. B. Clarke.
Bomdi-la 14-5-1955
- Coriandrum sativum* Linn
Bomdi-la 13-5-1955
The widely cultivated Coriander plant, was collected in a wild state at Bomdi-la.
Flowering profusely.

Araliaceae

- Aralia pseudo-ginseng* Benth.
Bomdi-la 14-5-1955
- Helwingia himalaica* Hk.f. & T.
Bomdi-la 16-5-1955
- Heptapleurum* sp.
Bomdi-la 13/16-5-1955
At least three species of this genus grow in the forests at Bomdi-la. As all the plants were seen without flowers or fruits, their specific determination has not been possible.
- Brassaiopsis hainla* Seem.
Bomdi-la 18-5-1955
Hooker gives for this species the distribution as from Nepal to Bhutan. It is seen far east also in NEFA.
- Macropanax oreophilum* Miq.
Bomdi-la 18-5-1955
- Hedera nepalensis* Koch.
Between Bomdi-la & Rupa 19-5-1955
Fruiting.
- Gamblea ciliata* Clarke.
Jabrang 8-5-1955
In Hooker's Flora of British India, it is reported from Sikkim at 10,000 ft. This shows much eastward distribution.

Cornaceae

- Cornus macrophylla* Wall.
Bomdi-la 13-5-1955
Flowering. The plant is locally known by the name Ganchasing. The fruits are eaten by the local people.

Caprifoliaceae*Viburnum erubescens* Wall.

- Bomdi-la 12-5-1955
 A good substitute timber for box-wood. The timber is valuable for carving, house posts, etc.

Lonicera macrantha DC.

- Bomdi-la 13-5-1955
 Locally known as Goochasing. This is stated to be used as a purgative with other medicines.

Rubiaceae*Myrioneuron nutans* Wall.

- Between Sisini & Jabrang 7-5-1955

Ixora sp.

- Bomdi-la 12-5-1955

Leptodermis griffithii Hk.f.

- Bomdi-la 18-5-1955

Rubia cordifolia Linn.

- Rupa, Jabrang 8-5-1955
 Very common. Flowering freely, Mojitoh. Its use as a red-dye yielding plant is well-known.

Galium triflorum Mich.

- Bomdi-la 18-5-1955

Galium mollugo Linn.

- Bomdi-la 12-5-1955

Valerianaceae*Valeriana wallichii* DC.

- Bomdi-la 12-5-1955

Valeriana hardwickii Wall.

- Bomdi-la 12-5-1955

Valeriana sp.

- Bomdi-la 12-5-1955

Compositae*Adenostemma* sp.

- Bomdi-la 12-5-1955

Dichrocephala latifolia DC.

- Sisini 6-5-1955

<i>Myriactis nepalensis</i> Less.	
Bomdi-la	12-5-1955
<i>Conyza japonica</i> Less.	
Bomdi-la	12-5-1955
<i>Blumea aromatica</i> DC.	
Sisini	6-5-1955
<i>Anaphalis cinnamomea</i> Clarke.	
Bomdi-la	13-5-1955
<i>Anaphalis araneosa</i> DC.	
Bomdi-la	13-5-1955
<i>Gnaphalium luteo-album</i> Linn.	
Rupa	9-5-1955
On very dry, much exposed mountain slopes.	
<i>Gnaphalium luteo-album</i> Linn. var. <i>multiceps</i> . (Wall. ex DC.) Hk.f.	
Rupa	9-5-1955
<i>Bidens biternata</i> (Lour) Merr. & Sherff.	
Rupa	9-5-1955
<i>Artemisia vulgaris</i> Linn.	
Bomdi-la	13-5-1955
This species which is said to be antiseptic, expectorant and anthelmintic, is worthy of consideration for extensive cultivation.	
<i>Gynura pseudo-china</i> DC.	
At Rupa and between Rupa & Bomdi-la	9/10-5-1955
<i>Senecio densiflorus</i> Wall.	
Bomdi-la	12-5-1955
<i>Senecio</i> sp.	
Bomdi-la	13-5-1955
<i>Cnicus argyranthus</i> DC.	
Rupa	9-5-1955
On exposed river-bed with water-worn pebbles.	
<i>Cnicus khasianus</i> Clarke.	
Bomdi-la	12-5-1955
I do not find this species in the Hooker's Flora of British India	
<i>Ainsliaea pteropoda</i> DC.	
Bomdi-la	12-5-1955

<i>Gerbera piloselloides</i> Cass.	
Between Rupa & Bomdi-la	10-5-1955
On dry exposed sunny slopes.	
<i>Crepis silhetensis</i> Hk.f.	
Rupa	9-5-1955
<i>Lactuca sagittarioides</i> Clarke.	
Rupa	9-5-1955
<i>Sonchus oleraceus</i> Linn.	
Bomdi-la	13-5-1955
<i>Sonchus arvensis</i> Linn.	
Rupa	9-5-1955
<i>Erechthites valerianaefolia</i> DC.	
Sisini	6-5-1955
Campanulaceae	
<i>Lobelia pyramidalis</i> Wall.	
Between Bomdi-la & Rupa	19-5-1955
<i>Wahlenbergia prainiana</i> Watt.	
Bomdi-la	13-5-1955
<i>Campanula sylvatica</i> Wall.	
Rupa	9-5-1955
Vacciniaceae	
<i>Agapetes auriculata</i> Hk.f.	
Sisini	6-5-1955
<i>Agapetes discolor</i> Clarke.	
Sisini	6-5-1955
<i>Vaccinum nummularia</i> Hk.f. & T.	
Bomdi-la	12-5-1955
<i>Vaccinum venosum</i> Wight.	
Bomdi-la	18-5-1955
<i>Vaccinum dunalianum</i> Wight.	
Bomdi-la	16-5-1955

Ericaceae

- Gaultheria griffithiana* Wight.
Jabrang 8-5-1955
- Leucothoe griffithiana* Clarke.
Bomdi-la 14-5-1955
- Andromeda elliptica* Sieb. & Zuce.
Between Bomdi-la & Rupa 19-5-1955
Common. Flowering.
- Andromeda formosa* (D. Don.) Wall.
Jabrang 8-5-1955
Flowering.
- Enkianthus deflexus* Sehn.
Jabrang 8-5-1955
Known from East-Nepal, Sikkim and Bhutan only. Its extension to NEFA (Jabrang)
is very interesting.
- Rhododendron vaccinioides* Hook.
Bomdi-la 18-5-1955
This species is reported by Hooker in the Flora of British India from Sikkim
Himalayas and Darjeeling. Its occurrence at Bomdi-la gives the species an
extended distribution.
- Rhododendron grande* Wight.
Bomdi-la 18-5-1955
Sikkim and Bhutan are the places previously known for this species. It extends
to NEFA also.
- Rhododendron falconeri* Hook.
Jabrang 8-5-1955
This is known abundant from East-Nepal to Bhutan. Its extension into NEFA is
interesting.
- Rhododendron arboreum* Sm.
Bomdi-la 12-5-1955
Known earlier from Kashmir to Bhutan and Khasia Mountains. Gives a continuous
distribution by its occurrence in NEFA.
- Rhododendron niveum* Hook.
Between Sisini and Jabrang 7-5-1955
Known from Sikkim Himalayas, extends into NEFA.
- Rhododendron griffithianum* Wight.
Jabrang 8-5-1955
Known from Sikkim and Bhutan, extends into NEFA.

Rhododendron edgeworthii Hook.

Rupa 9-5-1955
 Reported from Sikkim and Bhutan, extends into NEFA.

Rhododendron dalhousiae Hook.

Bomdi-la also between Sisini & Jabrang 7-5-1955
 Reported earlier from Sikkim Himalayas and Bhutan.

Monotropaceae*Monotropa uniflora* Linn.

Bomdi-la 18-5-1955

Primulaceae*Primula mollis* Hook.

Between Rupa and Bomdi-la 10-5-1955

Lysimachia alternifolia Wall.

Sisini 6-5-1955
 In shady places.

Myrsinaceae*Maesa indica* Wall.

Sisini 6-5-1955
 In jungles, by the side of river courses, in shady localities.

Myrsine semiserrata Wall.

Jabrang 6-5-1955
 Flowering and fruiting.

Ardisia macrocarpa Wall.

Rupa 9-5-1955
 Fruiting.

Styracaceae*Symplocos* sp.

Bomdi-la 16-5-1955

Symplocos theaeifolia Buch. Ham. ex D. Don.

Bomdi-la 16-5-1955

Symplocos glomerata King.

Bomdi-la 17-5-1955

Symplocos pyrifolia Wall.

Jabrang 8-5-1955
 Flowering.

Oleaceae

<i>Jasminum dispersum</i> Wall.		
Bomdi-la	. . . . .	18-5-1955
Common		
<i>Jasminum grandiflorum</i> Linn.		
Bomdi-la	. . . . .	18-5-1955
<i>Osmanthus suaveolens</i> King.		
Bomdi-la	. . . . .	18-5-1955
<i>Olea dentata</i> Wall.		
Bomdi-la	. . . . .	16-5-1955
<i>Ligustrum robustum</i> Blume.		
Rupa	. . . . .	9-5-1955
<i>Ligustrum myrsinoides</i> Dcne.		
Bomdi-la	. . . . .	12-5-1955
<i>Ligustrum</i> sp.		
Bomdi-la	. . . . .	12-5-1955

Asclepiadaceae

<i>Alstonia</i> sp.		
Rupa	. . . . .	9-5-1955
<i>Trachelospermum axillare</i> Hk.f.		
Bomdi-la	. . . . .	16-5-1955

Apocynaceae

<i>Hoya linearis</i> Wall.		
Between Sisini & Jabrang	. . . . .	7-5-1955

Loganiaceae

<i>Buddleia macrostachya</i> Benth.		
Bomdi-la	. . . . .	12-5-1955

<i>Buddleia paniculata</i> Wall.		
Rupa	. . . . .	9-5-1955

This species has been reported by Hooker as common westwards in Himalayas, becoming rarer in Sikkim and Bhutan. The occurrence of this species eastwards of Bhutan at NEFA is of considerable interest. We came across this frequently about Rupa.

<i>Buddleia asiatica</i> Lour.		
Sisini	. . . . .	6-5-1955

Gentianaceae*Gentiana quadrifaria* Blume.

Bomdi-la 14-5-1955

Boraginaceae*Cynoglossum* sp.

Bomdi-la 12-5-1955

Cynoglossum furcatum Wall.

Bomdi-la 12-5-1955

Scrophulariaceae*Verbascum thapsus* Linn.

Rupa 9-5-1955

Mimulus nepalensis Benth.Bomdi-la 18-5-1955
Flowering.*Mazus rugosus* Lour.Sisini 6-5-1955
Flowering.*Hemiphragma heterophyllum* Wall.Bomdi-la 14-5-1955
Flowering freely.*Veronica javanica* Blume.Bomdi-la 12-5-1955
Flowering.**Acanthaceae***Strobilanthes agrestis* Clarke.Bomdi-la 12-5-1955
This species extends eastwards beyond Bhutan and is seen at NEFA. Common as
under-shrubs in jungles.**Labiatae***Plectranthus coetsa* Ham.

Bomdi-la 13-5-1955

Plectranthus sp.

Bomdi-la 12-5-1955

Elsholtzia strobilifera Benth.

Bomdi-la 12-5-1955

<i>Calamintha umbrosa</i> Benth.		
Sisini		6-5-1955
<i>Ajuga macrosperma</i> Wall.		
Between Sisini and Jabrang		7-5-1955
In shady and moist situations.		
	Plantaginaceae	
<i>Plantago major</i> Linn.		
Bomdi-la		12-5-1955
	Amarantaceae	
<i>Amarantus gangeticus</i> Linn.		
Sisini		6-5-1955
	Polygonaceae	
<i>Polygonum posumbu</i> Ham.		
Sisini		6-5-1955
<i>Polygonum alatum</i> Ham.		
Sisini		6-5-1955
<i>Polygonum capitatum</i> Ham.		
Rupa		9-5-1955
Flowering.		
<i>Polygonum paniculatum</i> Blume.		
Bomdi-la		13-5-1955
Locally the plant is known by the name Kochomah, and is stated to be used for making jelly (?).		
<i>Polygonum molle</i> Don.		
Rupa		9-5-1955
<i>Rumex hastatus</i> Don.		
Rupa		19-5-1955
	Aristolochiaceae	
<i>Aristolochia saccata</i> Wall.		
Bomdi-la		18-5-1955
	Lauraceae	
<i>Cinnamomum</i> sp.		
Bomdi-la		16-5-1955
<i>Cinnamomum tamala</i> Nees & Ebr.		
On the way to Jabrang we saw a moderate sized tree felled, only the basal stump remaining and the bark partly peeled off.		7-5-1955
<i>Machilus edulis</i> King.		
Bomdi-la		16-5-1955
Reported earlier from Sikkim Himalayas near Darjeeling. Extends eastwards into NEFA.		

<i>Machilus odoratissima</i> Nees.	
Bomdi-la	12-5-1955
<i>Machilus kurzii</i> King.	
Between Rupa and Bomdi-la	10-3-1955
<i>Actinodaphne</i> sp.	
Bomdi-la	17-5-1955
Locally known as Sisi Lala and its wood used for planks.	
<i>Litsaea elongata</i> Wall.	
Bomdi-la	18-5-1955
<i>Lindera</i> sp.	
Bomdi-la	13-5-1955
Thymeleaceae	
<i>Daphne cannabina</i> Wall.	
Between Rupa and Bomdi-la	10-5-1955
Fruiting.	
Elaeagnaceae	
<i>Elaegnus umbellata</i> Thunb.	
Rupa	19-5-1955
This species is known from Kashmir to Nepal in temperate Himalayas. It extends beyond Nepal into NEFA.	
Euphorbiaceae	
<i>Phyllanthus parvifolius</i> Ham.	
Rupa	19-5-1955
On very xerophytic conditions. Flowering.	
<i>Daphniphyllum himalayense</i> Muell.	
Bomdi-la	13/16-5-1955
<i>Mercurialis laiocarpa</i> Sieb. et Zucc.	
Bomdi-la	12-5-1955
Urticaceae	
<i>Tragia</i> sp.	
Bomdi-la	12-5-1955
<i>Cannabis sativa</i> Linn.	
Bomdi-la	13-5-1955
Plenty, seen growing wild between Rupa and Jabrang.	
<i>Urtica parviflora</i> Roxb.	
Bomdi-la, Sisini	6-5-1955
As evergreen under-shrubs in outskirts of forests.	

<i>Ficus</i> sp.		
Bomdi-la	. . . . .	18-5-1955
<i>Pilea symmeria</i> Wedd.		
Bomdi-la	. . . . .	12-5-1955
<i>Lecanthus wightii</i> Wedd.		
Bomdi-la	. . . . .	13-5-1955
<i>Elatostema lineolatum</i> Wight.		
Sisini	. . . . .	6-5-1955
<i>Elatostema platyphyllum</i> Wedd.		
Sisini	. . . . .	6-5-1955
<i>Elatostema obtusum</i> Wedd.		
Bomdi-la	. . . . .	18-5-1955

Juglandaceae

<i>Engelhardtia spicata</i> Bl.		
Bomdi-la	. . . . .	17-5-1956

Betulaceae

<i>Betula alnoides</i> Ham.		
Bomdi-la	. . . . .	14-5-1955
<i>Betula cylindrostachys</i> Wall.		
Bomdi-la and on the way to Sisini, Jabrang ;	. . . . .	12-5-1955
Here and there on declivities, standing as large trees, with the barks, characteristically peeling off.		
<i>Quercus griffithii</i> Hook.		
Rupa	. . . . .	9-5-1955
All along the way, in many places. Abundant near Rupa.		
<i>Quercus lanuginosa</i> Don.		
Rupa	. . . . .	9-5-1955
<i>Quercus lamellosa</i> Smith.		
Bomdi-la	. . . . .	16-5-1955
<i>Pasania spicata</i> (Smith) Oerst.		
Bomdi-la	. . . . .	18-5-1955

Salicaceae

<i>Salix</i> sp.		
Bomdi-la	. . . . .	14-5-1955

Coniferae

<i>Taxus baccata</i> Linn.	
Bomdi-la	12-5-1955
<i>Pinus excelsa</i> Wall.	
Rupa	9-5-1955
Very common throughout.	
<i>Tsuga brunoniana</i> Carr.	
Jabrang	8-5-1955
Locally known as Deyaloh, is said to yield a kind of turpentine and resin. The oil is used for burning purposes.	

Orchidaceae

<i>Dendrobium nobile</i> Lindl.	
Between Bomdi-la and Rupa	19-5-1955
On rocks with mossy felt, plenty and flowering heavily.	
<i>Dendrobium dalhousianum</i> Wall.	
Jabrang	8-5-1955
Common.	
<i>Bulbophyllum griffithii</i> Reichb.	
Bomdi-la	18-5-1955
Hooker reports this from Khasia hills only.	
<i>Bulbophyllum collettii</i> King & Prantl.	
Bomdi-la	18-5-1955
<i>Cirrhopetalum brevipes</i> Hk f	
Bomdi-la	18-5-1955
Known from Sikkim Himalayas near Darjeeling.	
<i>Eria graminifolia</i> Lindl.	
Bomdi-la	13-5-1955
Known at Sikkim Himalayas.	
<i>Coelogyne corymbosa</i> Lindl.	
Jabrang	8-5-1955
<i>Otochilus alba</i> Lindl.	
Sisini	8-5-1955
<i>Calanthe chloroleuca</i> Lindl.	
Bomdi-la	13-5-1955
Known from Sikkim Himalayas.	
<i>Stauroopsis undulatus</i> Benth.	
Jabrang	8-5-1955

- Gateola falconeri* Hook.
 Sisini 6-5-1955
 We collected two impressive and full grown specimens of this species from Sisini in one of the thick forests. The plants were large and the root-stock was as thick as a man's wrist, the stem attaining a height of 5 to 5½ or 6 feet.

- Paphiopedilum insigne* (Wall.) Pfitz.
 Bomdi-la 14-5-1955

- Ritaia himalaica* King & Prantl.
 Sisini 6-5-1955
 Hooker does not refer to this in the Flora of British India.

Scitamineae

- Cautleya spicata* Baker.
 Between Rupa and Bomdi-la 10-5-1955

Haemodoraceae

- Ophiopogon wallichianus* Hook.
 Jabrang 8-5-1955

- Ophiopogon intermedius* Don.
 Bomdi-la 12-5-1955

Amaryllidaceae

- Curculigo orchoides* Gaertn.
 Sisini 6-5-1955

Liliaceae

- Smilax rigida* Wall.
 Bomdi-la 12-5-1955

- Smilax parviflora* Wall.
 Bomdi-la 13-5-1955

- Smilax minutiflora* A. DC.
 Bomdi-la 13-5-1955
 Locally known as Drumen. This is stated to be taken internally and applied outside as a remedy against eye-sore and stomach-pain, etc.

- Polygonatum nervulosum* Baker.
 Jabrang 8-5-1955

- Polygonatum punctatum* Royle.
 Bomdi-la 13-5-1955

- Streptopus simplex* D. Don.
 Bomdi-la 13-5-1955

<i>Smilacina pallida</i> Royle.	
Bomdi-la	14-5-1955
<i>Smilacina fusca</i> Wall.	
Bomdi-la	14-5-1955
<i>Tupistra aurantiaca</i> Wall.	
Between Rupa and Bomdi-la	19-5-1955
<i>Lilium giganteum</i> Wall.	
Rupa to Bomdi-la	10-5-1955
<i>Disporum pullum</i> Salisb.	
Rupa	9-5-1955
Near water course in shady places.	
<i>Paris polyphylla</i> Sm.	
Between Rupa and Bomdi-la	10-5-1955

Commelinaceae

<i>Commelina obliqua</i> Ham.	
Sisini	6-5-1955
<i>Streptolirion volubile</i> Edgew.	
Sisini	6-5-1955
In all wet shady places ; very common.	

Araceae

<i>Arisaema cuspidatum</i> (Roxb.) Engler.	
Bomdi-la	12-5-1955
<i>Arisaema consanguineum</i> Schott.	
Rupa to Bomdi-la	10-5-1955

Cyperaceae

<i>Carex filicina</i> Nees.	
Bomdi-la	12-5-1955

Gramineae

<i>Chimonobambusa callosa</i> Nakai.	
Bomdi-la	18-5-1955
<i>Bambusa</i> sp.	
Bomdi-la	18-5-1955

PTERIDOPHYTA**Pteridaceae**

- Monachosorum subdigitatum* Kuhn.
 Bomdi-la 18-5-1955
- Pteridium aquilinum* (L.) Kuhn.
 Sisini 6-5-1955
- Coniogramme javanica* Fée.
 Bomdi-la 13-5-1955

Aspidiaceae

- Aspidium aculeatum* Sm. var *setosum* Wall.
 Bomdi-la 14-5-1955
 Very common.
- Polystichum squarrosus* (Don) Fée.
 Bomdi-la 12-5-1955
 A very hardy fern on drier slopes.
- Polystichum falcatum* (L.F.) Diels.
 Bomdi-la 12-5-1955
- Polystichum aculeatum* (L) Schott.
 Bomdi-la 12-5-1955
- Dryopteris hirtipes* C. Chr.
 Bomdi-la 13-5-1955

Aspleniaceae

- Asplenium nidus* Linn.
 Sisini 6-5-1955
- Asplenium laciniatum* D. Don.
 Sisini 6-5-1955
 Grown as ornamental fern.
- Asplenium ensiforme* Wall.
 Jabrang 8-5-1955

Polypodiaceae

- Polypodium excavatum* (Bory.) Willd.
 Between Bomdi-la and Rupa 19-5-1955
- Pleopeltis thunbergiana* Kaulf.
 Bomdi-la 16-5-1955

<i>Drynaria quercifolia</i> J. Smith.	
Bomdi-la	16-5-1955
<i>Crypsinus griffithianus</i> Copeland.	
Bomdi-la	13-5-1955
<i>Loxogramme involuta</i> Presl.	
Bomdi-la	13-5-1955
<i>Cyclophorus flocculosus</i> (Don.) C. Chr.	
Bomdi-la	11-5-1955

Vittariaceae

<i>Vittaria elongata</i> Sw.	
Bomdi-la	12-5-1955

Lycopodiaceae

<i>Lycopodium clavatum</i> Linn.	
Bomdi-la	14-5-1955

Selaginellaceae

<i>Selaginella caulescens</i> Spring.	
Jabrang	8-5-1955

Equisetaceae

<i>Equisetum diffusum</i> D. Don.	
Between Sisini and Jabrang	7-5-1955
On the banks of river course on gravelly sub-strata, in shade, in crevices of rocks and boulders.	

BRYOPHYTA**Marchantiaceae**

<i>Marchantia polymorpha</i> Linn.	
Sisini	6-5-1955

<i>Marchantia</i> sp.	
Sisini	6-5-1955

<i>Dumortiera hirsuta</i> Reinw. Bl. et Nees.	
Sisini	6-5-1955

Targionaceae

<i>Targionia hypophylla</i> Linn.	
Sisini	6-5-1955

LICHENES**Parmeliaceae**

<i>Parmelia</i> sp.	
On trunks of trees and also on dry rocky faces at many places.	

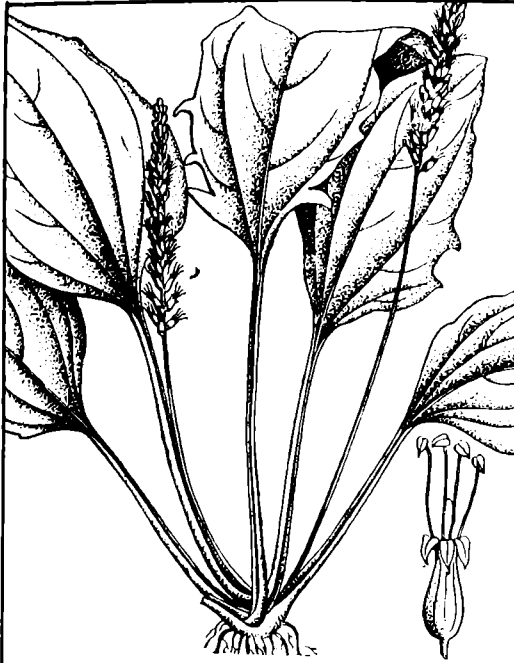
Usneaceae

<i>Usnea</i> sp.	
On trees on several localities.	

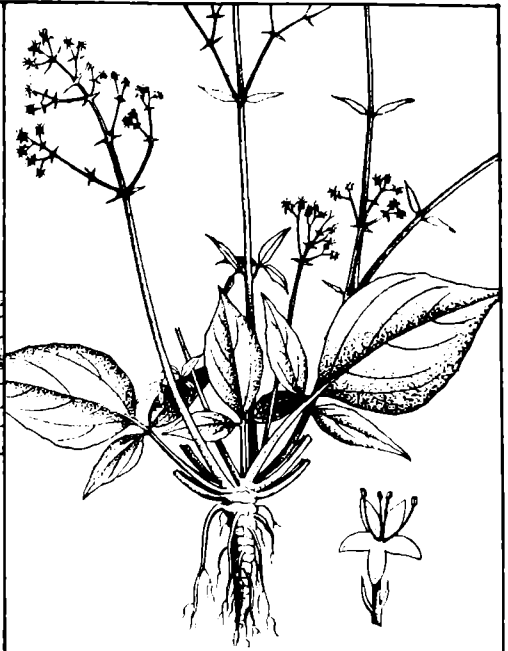
KAMENG DIVISION (NEFA)

Synopsis of the Collections determined

Classification'	Families				Genera				Species				
I. CRYPTOGRAMAE				12				22					27
(i) Thallophyta	2			2				2					2
(ii) Bryophyta	2			2				3					4
(iii) Pteridophyta				8				17					21
(1) Filicinae	5				14					18			
(2) Lycopodinae	2				2					2			
(3) Equisetinae	1				1					1			
II. PHANEROGAMAE				74				193					264
(i) Gymnospermae				1				3					3
(1) Coniferae	1				3					3			
(ii) Angiospermae				73				190					261
(A) Monocotylae				9				28					36
(B) Dicotylae				64				162					225
(a) Polypetalae								72					95
(1) Thalamiflorae	13	32			22					26			
(2) Disciflorae	9				14					21			
(3) Calyciflorae	10				36					48			
(b) Gamopetalae								64					92
(c) Monochlamydae								26					38
TOTALS				80				215					291



8. *PLANTAGO MAJOR* Linn.



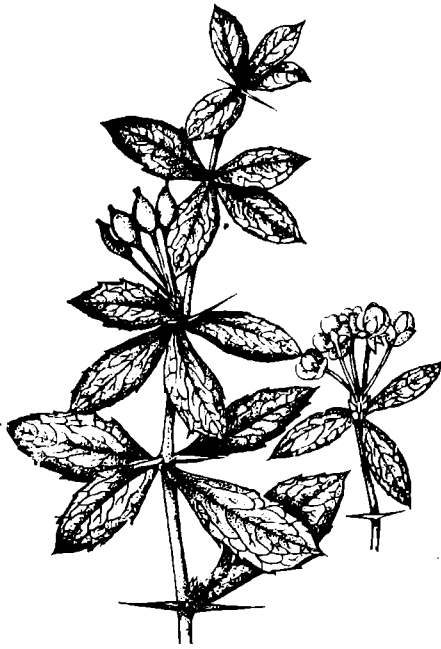
9. *VALERIANA HARDWICKII* Wall.



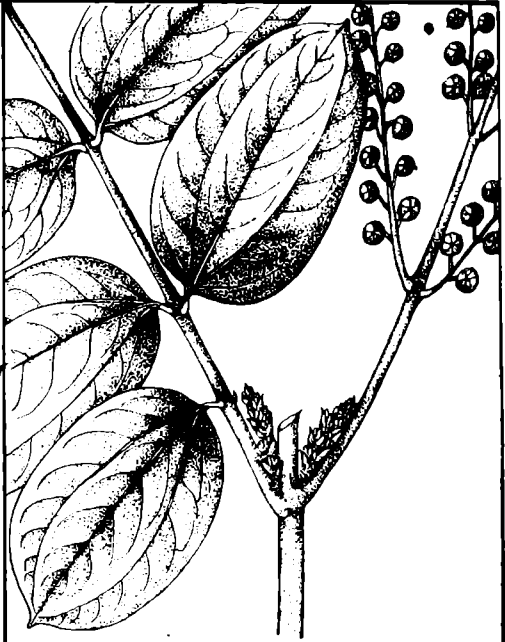
10. *VALERIANA WALLICHII* DC.



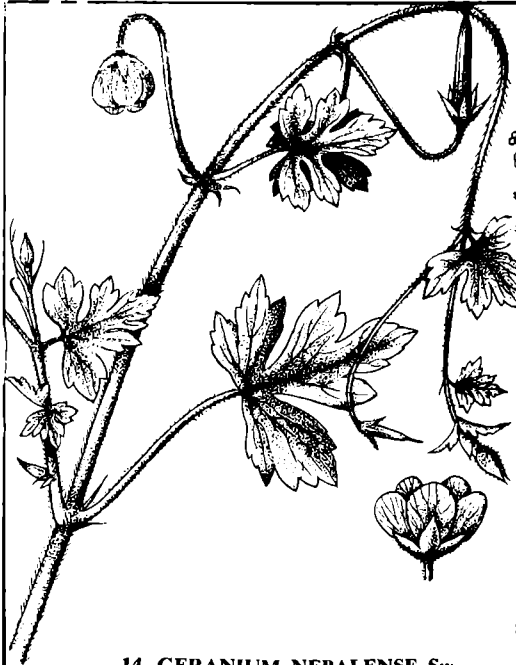
11. *ARTEMESIA VULGARIS* Linn.



12. BERBERIS ARISTATA DC.



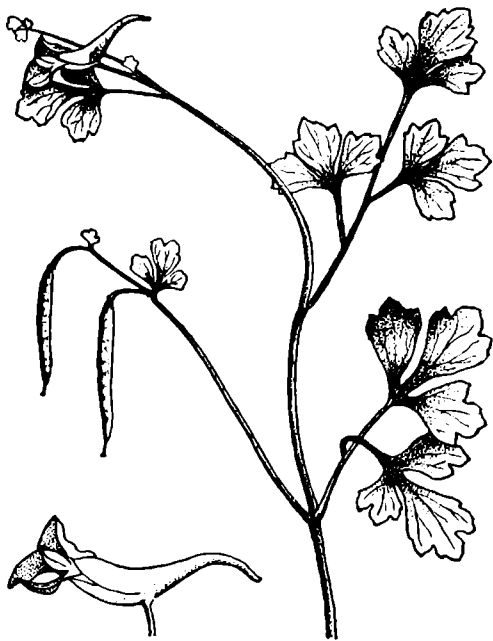
13. CORIARIA NEPALENSIS Wall.



14. GERANIUM NEPALENSE Sw.



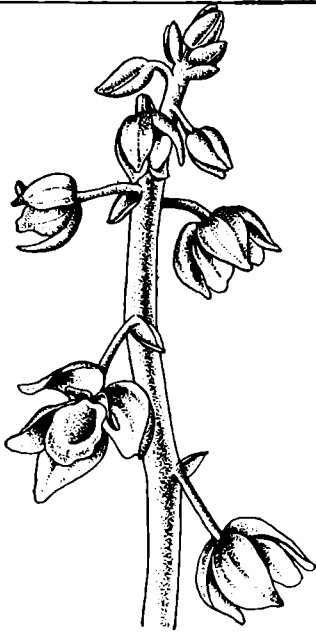
15. RUBIA CORDIFOLIA Linn.



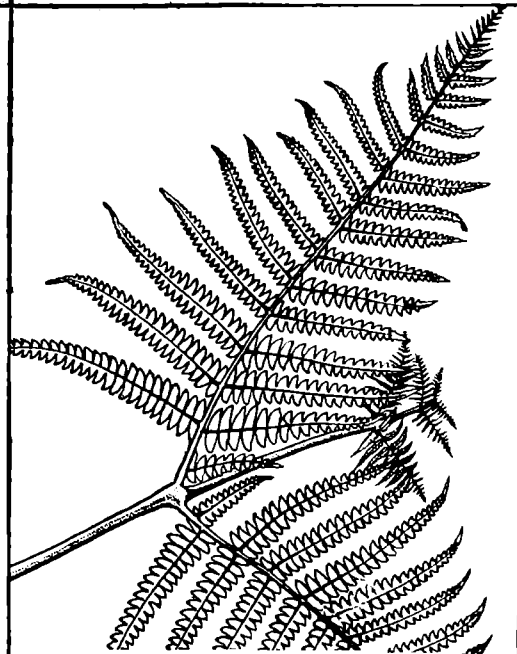
16. *CORYDALIS LEPTOCARPA* Hk.f. & T.



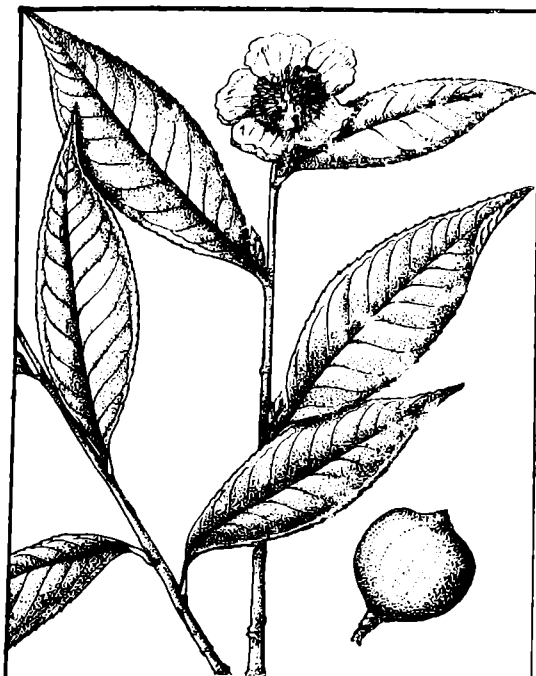
17. *MYRSINE SEMISERRATA* Wall.



18. *GALEOLA FALCONERI* Hk. f.



19. *PTERIDIUM AQUILINUM* (L.) KUHN.



20. *CAMELLIA DRUPIFERA* Lour.



21. *ANDROMEDA ELLIPTICA* Sieb & Zucc.



22. *DEUTZIA STAMINEA* Br.



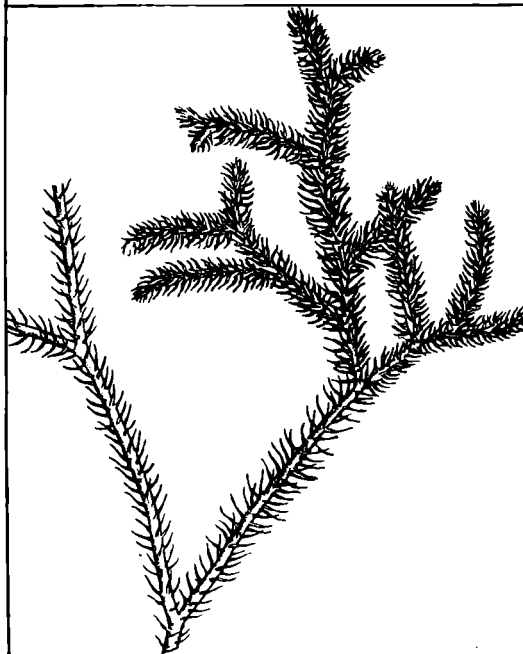
23. *ALBIZZIA STIPULATA* Boiv.



24. *DICHROA FEBRIFUGA* Lour.



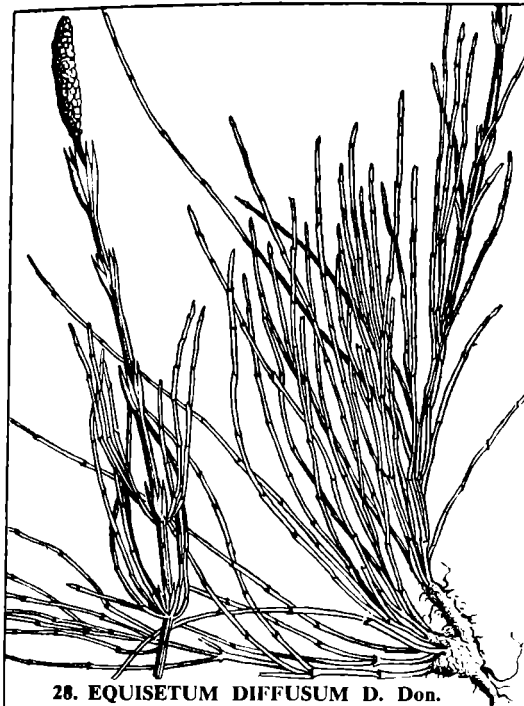
25. *ELAEGNUS UMBELLATA* Thunb.



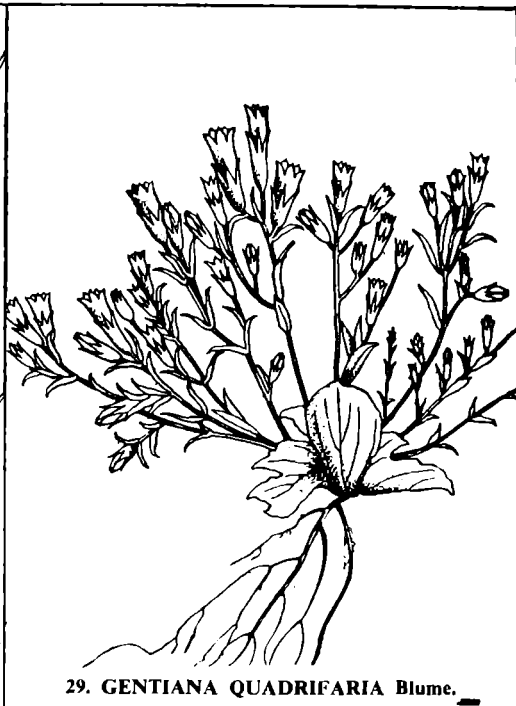
26. *LYCOPodium CLAVATUM* Linn.



27. *DRYNARIA QUERCIFOLIA* J. Smith.



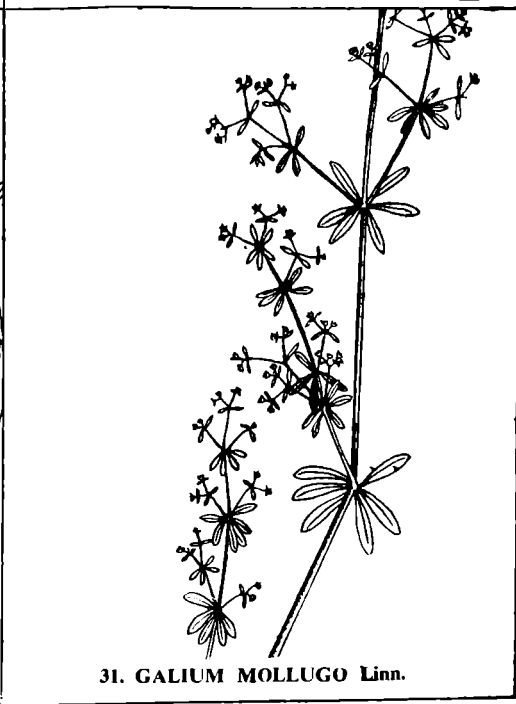
28. *EQUISETUM DIFFUSUM* D. Don.



29. *GENTIANA QUADRIFARIA* Blume.



30. *CORNUS MACROPHYLLA* Wall.



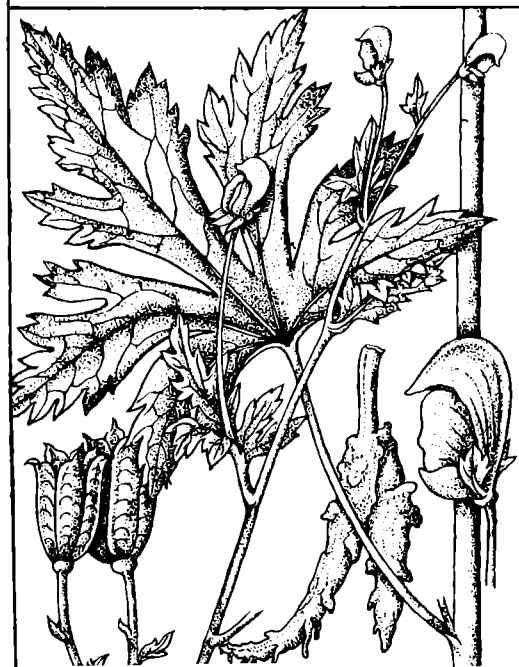
31. *GALIUM MOLLUGO* Linn.



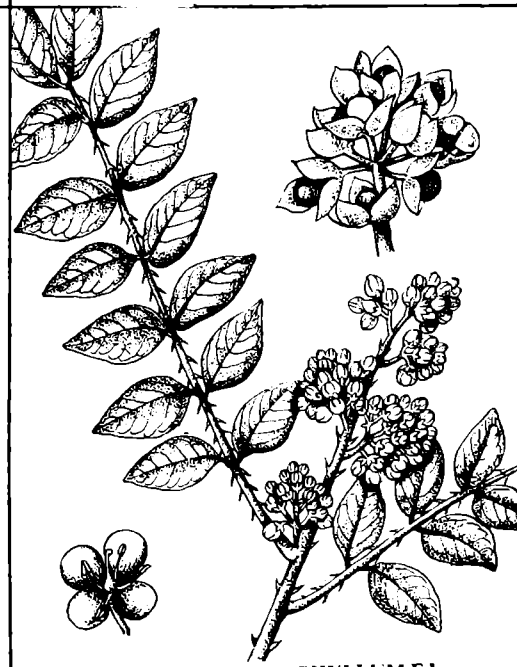
32. SKIMMIA LAUREOLA Hk. f.



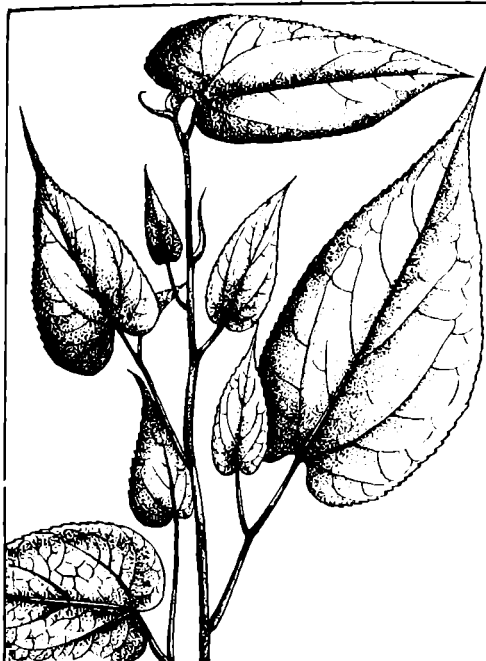
33. PINUS EXCELSA Wall.



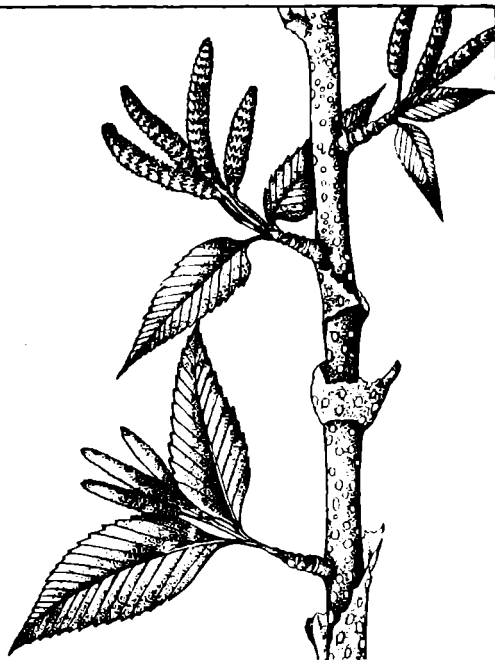
34. ACONITUM PALMATUM D. Don.



35. ZANTHOXYLUM OXYPHYLLUM Edgew.



36. *BETULA ALNOIDES* Ham.



37. *BETULA CYLINDROSTACHYS* Wall.



38. *CANNABIS SATIVA* Linn.



39. *DAPHNE CANNABINA* Wall.

List of Agents for the sale of Government of India Publications as on 7-12-56—contd.

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Bharat Book Centre.
Globe Traders.
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Halchal Sahitya Mandir (R).
- GWALIOR**—
M. B. Jain & Brothers.
Saraswati Sadan (Loyal Book Depot).
**Supdt., Ptg. & Sty. (M.B.)*.
- HOSHARPUR**—
Universal Book Stores.
- HYDERABAD (DN.)**—
**Director, Govt. Press (Publication Bureau)*.
Hyderabad Book Depot.
Peoples' Book House, Nizamabad Road.
Swaraj Book Depot, 1308, Lakri-ka-pul.
- HANAMKONDA**—
Deccan Book Stall.
- INDORE**—
Rupayama Rampur Wala Buildings.
Shri Indore Book Depot, 33, Mahatma Gandhi Road.
Wadhwa & Co., 56, Mahatma Gandhi Road.
- JAI PÜR CITY**—
Garg Book Co., Tripolia Bazar.
Rajasthan Pustak Mandir, Tripolia Bazar
**Govt. Ptg. & Sty. Deptt., Rajasthan*.
Vant Mandir, Sawai Mansingh Highway.
- JAMMU (TAWI)**—
Krishna General Stores, Itaghu Nath Bazar.
Students' Stores, Itaghu Nath Bazar.
- JAMSHEDPUR**—
Amar Kitab Ghar, Diagonal Road, P. B. No. 78.
- JAMNAGAR**—
Swadeshi Vastu Bhandar.
- JODHPUR**—
Dwarka Dass Rathi.
Kitab Ghar, Sojati Gate.
Chajra Brothers, Tripolia Bazar.
Mahesh Book House (B).
- JUBBULPORE**—
Modern Book House, Jawaharganj.
- JULLUNDUR CITY**—
Hazooria & Sons, Mai Hiran Gate.
Jain General House.
University Publishers.
International Book & News Co., G. T. Road (R).
- KANPUR**—
Advani & Co.
Sahitya Niketan.
Universal Book Stall, The Mall.
- KARNAL**—
Malhotra & Co.
- KHANDWA**—
The Suresh Trading Co.
- KHURJA**—
Bharati Mandir, 31-C, Nai Basti.
- KOLHAPUR**—
Maharashtra Grantha Bhandar (B).
- KODARMA**—
The Bhagwati Press, P. O. Thumstalaiya.
- KOTTAYAM**—
The Vidyarthi Mitram Book Depot, P. B. No. 8.
- KUMTA**—
S. V. Kamat.
- KAPASAU (RAJASTHAN)**—
Namdhar Brothers (B).
- KURNOOL**—
Fineland Agencies (Regd.).
- KOZHIKODE**—
K. P. Brothers (B).
- LUCKNOW**—
Balkrishna Book Co., Ltd., Hazratganj.
British Book Depot, 84, Hazratganj.
Law Book Agency, 29-A, Kachery Road.
Ram Advani, Hazratganj.
Universal Publishers Ltd., Plaza Bldg.
Upper India Publishing House Ltd., Literature Palace.
Soochna Sahitya Depot (State Book Depot, U. P.).
- LUDHIANA**—
Loyal Book Depot.
Molindra Brothers (B).
- MADRAS**—
Accounts Test Institute, P. O. 740, Egmore.
C. Subbiah Chetty & Co., Triplicane.
Higginbothams.
K. Krishnamurthy, Mount Road.
Presidency Book Supplies, 8, Pycrofts, Triplicane.
**Supdt., Govt. Press, Mount Road*.
Varadachary & Co.
Simhan Publishing Co.
- MADURAI**—
E. M. Gopal Krishna Kone, North Chitra Street.
Viveka Nanda Press, 48, West Masai Street.
- MANDSAUR**—
Sikhal News Agency.
- MANGALORE**—
U. K. Shenoy & Sons, Car Street.
- MASULIPATNAM**—
Triveni Publishers.
M. Sestachalam & Co.
- MERUT**—
Hind Chitra Press.
Loyal Book Depot, Chhlipi Tank.
Universal Book Depot.
Prakash Educational Stores.
- MORADABAD**—
National Book Depot.
- MYSORE**—
H. Venkataramiah & Sons, New Statue Circle.
J. Nandu Mal & Sons, Lansdown Bldg.
Chandra Stores, New Statue Circle (B).
- NAGPUR**—
**Supdt., Govt. Ptg. (M. P.)*.
New Book Depot, Modi No. 3, Sitabuldi.
Western Book Depot.
- NAINITAL**—
Consul Book Depot.
- NEW DELHI**—
Ajmeri Gate Paper & Sty. Mart., 1/6B, Block, Ajmeri Gate
Extn.
Amrit Book Co., Connaught Circus.
Bhawuni & Sons, Connaught Place.
Central News Agency, Connaught Circus.
Empire Book Depot, 278, Aliganj, Lodhi Road.
English Book Stores, 'L' Block, Connaught Circus.
Faqir Chand Marwah & Sons, Khan Market.
Jain Book Agency, Connaught Place.
Luxmi Book Store (B).
Hind Book House (B).
Jayna Book Depot, Bank Street, Karol Bagh.
Navjag Traders, Original Road, Karol Bagh.
Oxford Book & Stationery Co., Sealdia House.

List of Agents for the sale of Government of India Publications as on 7-12-56--concl'd.

- NEW DELHI—contd.**
 Ram Krishna & Sons (of Lahore), 13/13, Connaught Place.
 Raj Book Depot, 1, Bengali Mal Market.
 Saraswati Book Depot, 15, Lady Hardinge Road.
 Sikh Publishing House Ltd., 70/0, Connaught Place.
 Mehra Brothers, 50-G, Kalai B.
 Suneja Book Centre, 24/90, Connaught Circus.
 Taneja Book & Stationery Mart, Bakina Road.
 United Book Agency, 47 Amritkaur Market, Paharganj.
 Venus Sales Corp. (R), Karol Bagh New Delhi.
- ONGOLE—**
 Shri D. Sreekrishnamurty, Prop.
 Abiyudaya Book Circulating Co.
- PATHANKOT—**
 The Krishna Book Depot.
- PATIALA—**
 Jain & Co., Bazar Shah Nashin.
 *Supdt., Bhupendra State Press.
- PALGHAT—**
 Shri V. K. Itamalingam, Vadakkanthara (R).
- PATNA—**
 Book Centre, Near B. N. College.
 Patuja Brothers, Rajendra Path (R).
 Scientific Book Co. (R).
 Novelty & Co. (R).
 *Supdt., Govt. Printing, Bihar.
 J. N. P. Agarwala & Co., Padri-ki-Haveli,
 Lakshmi Trading Co., Padri-ki-Haveli.
 Moti Lal Banarsi.
- POONA—**
 Deccan Book Stall, Ferguson College Square Road.
 Imperial Book Depot, 268, Main Street.
 International Book Service, Deccan Gymkhana.
 N. B. Bhalerao, 602 Shanwar Peth.
 Raka Book Agency.
- PUDUKKATTAI—**
 P. N. Swaminatha Sivam & Co., East Main Street.
- RAJKOT—**
 Mohan Lal Dossabhai Shah.
- RAIPUR—**
 Kasimud-Din & Sons, Gole Bazar (R).
- ROORKEE (U. P.)—**
 Cambridge Book Depot (R).
- RANCHI—**
 Ideal Book Stores, Main Road.
- REWA—**
 *Supdt., Govt. State Emporium, V. P.
- SAGAR (M. P.)—**
 Students Book Depot (R).
- SECUNDERABAD (DN.)—**
 Hindustan Diary Publishers.
- SHILLONG—**
 *Supdt., Assam Sectt. Press.
 Chapla Book Stall (R).
- SIBSAGAR (ASSAM)—**
 T. Chuttya (R).
- SILCHAR (ASSAM)—**
 Shri Nishik Sen (R).
- SIMLA—**
 Azad Kitab Mahal, Stall No. 13.
 J. Ray & Sons (India) Ltd.
 Minerva Book Shop, The Mall.
 New Book Depot.
 *Supdt., Himachal Pradesh Govt.
 Maria Brothers, 64, The Mall (R).
- SIROHI—**
 Milapchand Balebutmal Haran, Kesar Road.
- SONEPAT—**
 United Book Agency.
- SRINAGAR—**
 The Kashmir Book Shop, Residency Road.
- SURAT—**
 Shree Gajanan Pustakalaya, Lower Road.
- TRICHINOPOLY FORT—**
 S/S. Krishnaswami & Co., Teppukulam.
 Panaiappa Brothers, Teppukulam.
- TRIVENDRUM—**
 International Book Depot, Main Road.
 *Supdt., Govt. Press, Travancore-Cochin.
- VELLORE—**
 S. Venkatasubhan, Law Booksellers.
- VIJAYAWADA—**
 Hindustan Diary Publishers.
- UDAIPUR—**
 Vidya Bhawan (R).
- VIZAGAPATAM—**
 Gupta Brothers, Vizia Buildings.
 M. S. R. Murty & Co.
 Book Centre, 11/97, Main Road.
- WARDHA—**
 Swarajaya Bhandar, Bhaji Market.
- Govt. of India Kitab Mahal, Queensway,
 Opposite India Coffee House, New
 Delhi } For local sale
 Govt. of India Book Depot, 8, Hastings } only.
 Street, Calcutta.
- High Commissioner for India in London,
 India House, Aldwych, London, W.C.2. } For all enquiries
 and orders from }
 Europe and }
 America.