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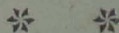
RECORDS
OF THE
BOTANICAL SURVEY OF INDIA

VOLUME XVIII—NO. 2.

A BOTANICAL TOUR IN
KASHMIR STATE

By

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Systematic Botanist, Northern Circle.
BOTANICAL SURVEY OF INDIA, DEHRA DUN.



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INTRODUCTION

I was deputed during the summer of 1956 by the Chief Botanist of the Botanical Survey of India to explore botanically certain parts of the State of Kashmir, with a view to study the flora of the State and to bring back as complete a representation of the vegetation as possible. Accompanied by a photographer, a fieldman, and two peons I left Calcutta on the 21st of June 1956 by train to Pathankot and arrived in Srinagar on the 26th June 1956. The party spent nearly six weeks in the State collecting plants from various places as described in the following pages and returned to Calcutta on the 6th of August 1956. The total number of species of which specimens were collected in this trip is 550, of which 491 are *Angiosperms*, 7 are *Gymnosperms* and 19 are *Pteridophytes*, as enumerated in this work. Specimens of *Bryophytes* and *Lower Cryptogams* could not be definitely identified for want of a properly equipped herbarium. These, therefore, have not been included in the present census.

Grateful acknowledgement is made to the authorities of the Government of Jammu and Kashmir for the facilities provided during this tour. The party is, particularly, indebted to Col. Sir R. N. Chopra, Director, Drug Research Institute, Srinagar for his unfailing kindness and valuable guidance throughout the period of collection.

The identification of the specimens collected during this tour was done at the Herbaria of the Indian Botanic Garden at Sibpur and the Forest Research Institute at Dehra Dun. Grateful acknowledgement is made to the authorities of these institutions.

BOTANICAL HISTORY

The history of botanical exploration in Kashmir dates back to 1831 when Victor Jacquemont (1801—1832) who was the first botanist to enter Kashmir collected a large number of plants in that year. He did not live long to complete the study of his collections. His collections were, however, studied and published by J. Cambessedes and F. Decaisne in 1845. Jacquemont was followed by Baron Von Huegel and Godfrey Thomas Vigne who both met in the Vale of Kashmir and opened the doors for further explorations. Vigne collected 99 specimens from Kashmir and other parts in 1835. The interesting flora drew the attention of many well known plant collectors and travellers of those days like Dr. Moorcroft who collected specimens in the Ladakh region and sent his collections to Wallich and Royle. Falconer, another plant collector also obtained plants from Kashmir, probably, in the year 1839. Royle sent collectors to Kashmir during the years, 1833—1839 and his rich collections were published in London in the year 1839. Dr. Thomas Thomson who collected in different areas in Jammu and Kashmir in 1849 was among the pioneers who botanised the state of Kashmir. An account of his exploration came out in London Journal of Botany, Vol. VII, page 657 and Hooker's Journal of

Botany, Vol. I, page 68 (1849). The other botanists who had a hand in the exploration of the flora of Kashmir are Schlagintweit (1855-1857), William Hay (1862), J. L. Stewart (1868) and Henderson and Hume (1873). C. B. Clarke who collected plants from almost all parts of India visited Kashmir in 1876 and brought a fairly good number of specimens. In the years 1892-1893, Duthie was deputed by the Botanical Survey of India to explore and collect plants from Kashmir. His survey was mostly confined to the Botany of Baltistan and Gilgit. He has recorded his tour observations in the pages of Records of the Botanical Survey of India. Duthie engaged several collectors in Northern parts of India and among them W. Gollam and Inayat collected in Kashmir in 1889 and 1891 respectively. G. A. Gammie collected in Kashmir in the year 1891 and 1893. Meebold explored certain parts of Kashmir State in 1905 and published an interesting list of Plants of Kashmir in 1909. Keshavanand of Indian Forest Service collected plant specimens in Kashmir from 1906 to 1909, especially in Kishenganga valley.

W. Koelz collected in Kashmir from 1931—1936, all his specimens being sent to U.S.A. F. Halberg collected in Kashmir mainly at Apharwat and Blatter's "Beautiful flowers of Kashmir" was based on Halberg's collection.

O. Coventry, Conservator of Forests, Kashmir, took ample coloured photos of the plants of that state, which are reproduced in his "Wild Flowers of Kashmir". Recently R. R. Stewart of Rawalpindi has made several visits to the State with a view to prepare a comprehensive flora of Kashmir.

TOPOGRAPHY

Kashmir extends from 32° 17' to 36° 58' N. latitude and from 73° 26' to 80° 30' E. longitude. The State is surrounded on the north by the U.S.S.R. and Sinkiang, on the north-east by Tibet, on the east by the Punjab Himalayas and on the south by Pakistan and Punjab. It covers an area of 80,900 sq. miles.

The State can be divided naturally into three distinct regions, each of which exhibits its own type of vegetation.

1. The Valley: The Vale of Kashmir is situated at an altitude of 2,000 m and extends roughly 84 miles in length and 20 to 25 miles in breadth. It is surrounded on all sides by mountains of great heights.

2. The Mountainous Region: Mountains of varying heights surround the valley. Nanga Parbat (8,728 m) is in the north, Haramukh (5,635 m) in the east, Mahadeo in the south and further south, Gwash Brari (5,934 m) and the peak of Amarnath at 5,774 m; to the south-west is the Pir Panjal Range with peaks of 5,000 m, and in the north-west corner, the Kajinag of 4,042 m.

3. The Alpine Zone: The Alpine Zone exists at higher altitudes. This zone ranges from 3,667 m to 5,000 m, followed by regions of perpetual snow.

ITINERARY AND COLLECTION

1. The Valley: The valley is drained by the Jhelum and numerous fast moving snow-fed streams from the surrounding mountains. Many canals, nalahs, lakes, springs,

etc., form the distinctive features of the valley. This region is very much disturbed due to extensive cultivation of grain crops like Paddy and Maize. In spite of this, one could see the extremely rich vegetation in the beds and banks of streams, nalahs and canals. Our exploration was confined only to certain parts of the valley. The flora of Babul Canal area and the Ferozepur Nalah is extremely rich and several interesting plants were collected in this area. The *Myricaria germanica* association in the river beds and *Polygonum alpinum* (white and red flowers) association on the banks were the conspicuous elements in the flora of this region. The water courses and the margins of the streams supported *Spiraea lindleyana*, *Impatiens brachycentra*, *I. sulcata*, *Chenopodium botrys*, *Epilobium cylindricum*, *Plantago ovata*, *Euonymus hamiltonianus*, *Codonopsis ovata*, *Geranium collinum*, *G. wallichianum*, *G. nepalense*, *Rosa moschata*, *Fragaria vesca*, *Arisaema jacquemontii* and species of *Rubus*, *Salix* and *Jasminum*. The endemic species, *Lavatera kashmiriana* with its beautiful large pink flowers was in great abundance. Plants of economic importance noticed in this area were *Cichorium intybus*, *Ferula jaeschkeana*, *Solanum tuberosum* (cultivated), and a species of *Dioscorea*. Parasitic *Cuscuta* on *Viburnum nervosum* and *Viscum japonicum* on *Juglans* sp., were also collected. The important edible fruit yielding plants of this area are *Crataegus oxyacantha*, *Fragaria vesca* and species of *Rubus* and *Juglans*.

The next water course investigated was the Ninglinala area. The vegetation here is not so rich and varied. Among the interesting plants of this area are *Circaea alpina*, *Impatiens edgeworthii* and *Aesculus indica*. Plants of economic importance of this area are *Plantago ovata*, *Oxalis acetosella*, *Aconitum heterophyllum*, *Podophyllum hexandrum*, *Valeriana wallichii*, and *V. hardwickii* var. *acuminata*. Some of the deciduous trees of importance of the belt are *Acer caesium*, *Parrotia jacquemontiana*, *Platanus orientalis* and species of *Salix* and *Populus*.

Kashmir Valley abounds in lovely lakes and swampy lagoons with distinctive hydrophytic formations. Our explorations were confined to the Wular, Sopore, Manasbal, Nagin and Dal lakes, where a large number of specimens were collected. One could see the grandeur of the sacred lotus plants even from a distance. The lakes are beautifully covered by *Nelumbo nucifera*, *Nymphaea alba*, *Trapa natans*, *Sagittaria sinensis*, *Euryale ferox* and species of *Potamogeton*, *Salvinia*, *Lemna*, *Naias* and *Epilobium*. The margins of the lakes are edged with many interesting plants. In the swampy moist margins were collected *Sagittaria sinensis* and species of *Alisma*, *Plantago* and *Epilobium*. These are followed by an abundance of hydrophytes, chief among them being *Nymphaea alba*, *Nelumbo nucifera*, *Trapa natans*, *Euryale ferox* and species of *Lemna*, *Limnanthemum* and *Salvinia*. The important submerged plants are *Myriophyllum spicatum* and species of *Naias*, *Potamogeton*, *Ceratophyllum* and *Chara*. Another interesting aspect of this hydrophytic flora is the formation of 'Floating Gardens'. These 'Gardens' are composed of *Typha angustata*, *Nymphaea alba*, *Trapa natans* and species of *Lemna*, *Sagittaria*, *Naias*, *Potamogeton* and *Salvinia*, and drift from place to place depending on the water currents. The plants of economic importance of this area are *Nelumbo nucifera*, *Euryale ferox*, *Trapa natans* and *Typha angustata*.

2. The Mountainous Region: The mountains around the valley are chiefly dominated by forests. The mountains exhibit a gentle gradient with elevations ranging from

2,334 m to 5,674 m. The elevation of these mountains is responsible for the occurrence of plants which are common in temperate regions. The mountains have a good number of glades clothed in grass, massive ridges, and spurs. The two important spurs are the well known Sind and Lidder valleys. Our excursion was confined only to a few of the mountains. A camp was set up at Yarikkah (Tangmarg) at 2,467 m and the surrounding mountains and nalahs were explored. At Tangmarg, one can notice the gradual replacement of deciduous plants by conifers. Some of the common and conspicuous trees are *Pinus wallichiana*, *Abies pindrow*, *Cedrus deodara*, *Taxus baccata* and *Picea smithiana*. In the Tangmarg area, the vegetation is mixed up; in the valleys, one can see rich herbaceous vegetation and at higher altitudes the conifers dominate. Amidst the coniferous plants, specially under their shade, the most common plants are *Parrotia jacquemontiana*, *Aesculus indica*, *Acer caesium*, *Viburnum nervosum*, *Skimmia laureola*, *Indigofera gerardiana* and the herbaceous vegetation consists chiefly of *Plantago major*, *P. ovata*, *Lotus corniculatus*, *Trifolium pratense*, *T. repens*, *Cichorium intybus*, *Potentilla* sp., *Impatiens brachycentra*, *I. sulcata*, *Bupleurum falcatum*, *Rumex nepalensis*, *Dianthus jacquemontii*, and species of *Mentha*, *Cynoglossum*, *Medicago* and *Achillea*.

Proceeding from Tangmarg to Gulmarg the flora becomes denser and many characteristic plants were collected. Amidst tall gigantic conifers, the shrubby undergrowth is constituted chiefly of *Phytolacca acinosa* with greenish white flowers, *Sambucus ebulus*, *Viburnum nervosum* and species of *Urtica*, *Myosotis* and *Rosa*. The herbaceous vegetation was also rich in many species which had already been collected by the party in the Tangmarg area. Fringing the moist slopes of the valley and near the streams, the plants commonly found are *Caltha palustris*, *Anagallis arvensis*, *Oxalis corniculata*, *Verbascum thapsus*, *Rumex nepalensis*, *Alisma plantago*, *Polemonium coeruleum*, *Fragaria vesca*, *Geum urbanum* and species of *Impatiens*, *Geranium*, *Ranunculus*, *Adiantum*, *Equisetum*, Moss, *Lycoperdon*, and *Geastrum*.

The vegetation at Gulmarg (3,000 m) especially in the Golf Maidan is very much disturbed. The Golf Maidan has one of the loveliest grass fields in Kashmir and here one could see very interesting small plants amidst the green turf. These are *Potentilla* sp., *Ranunculus lobatus*, *R. arvensis*, *Anemone obtusiloba*, *Plantago major*, *Stellaria paniculata*, *S. media*, *Alchemilla vulgaris*, *Thymus serpyllum*, *Galium aparine*, *G. triflorum* and others. Slightly raised regions around the golf field supports shrubby plants like *Viburnum nervosum*, *Polemonium coeruleum*, *Indigofera gerardiana*, *Rosa macrophylla*, *R. moschata* and *Rubus* sp. Bordering water courses and slopy moist regions are found *Veronica beccabunga*, *Verbascum thapsus*, *Cardamine macrophylla*, *Cerastium dahuricum*, *C. vulgatum*, *Thlaspi alpestre*, *Senecio chrysanthemoides*, *Phlomis spectabilis*, *Prunella vulgaris* and *Scrophularia* sp.

The journey up hill from Gulmarg to Khillanmarg through the rich fir forests was extremely interesting and yielded several interesting plants of economic importance. The flora is rich and one could see the change in the herbaceous vegetation and the occurrence of purely temperate plants. On the way were collected under shady conditions, *Podophyllum hexandrum*, *Aconitum laeve*, *Aquilegia pubiflora*, *Actaea spicata*, *Thlaspi alpestre*, *Valeriana wallichii*, *Cardamine macrophylla*, *Valeriana hardwickii* and *Trillium* sp. Edged near the water courses were *Caltha palustris*, *Polemonium coeruleum*,

Angelica glauca, *Arisaema jacquemontii*, *A. utile*, *Roripa indica*, *Osmunda claytoniana*, *Adiantum* sp. and Moss sp.

The most important trees at an altitude of 3,167 m to 3,334 m are *Acer caesium*, *Skimmia laureola*, *Lonicera quinquelocularis*, *L. orientalis* var *govaniensis* and species of *Syringa* and *Salix*. The herbaceous vegetation from 3,167 m onwards chiefly consisted of *Taraxacum officinale*, *Hypericum perforatum*, *Prunella vulgaris*, *Trifolium repens* and *Cynoglossum* sp., as also *Artemisia vulgaris*, *Aquilegia pubiflora* and species of *Primula*, *Fritillaria* and *Monotropa*. The other plants of common occurrence from 3,334 m to 3,534 m are *Androsace sarmentosa*, *Anemone obtusiloba*, *Potentilla gelida*, *Anaphalis cuneifolia*, *Geranium collinum*, *Inula royleana*, *Trigonella emodi*, *Polygonum affine*, *Viola* sp., as also species of *Salvia*, *Iris* and *Rumex*. Some of the shrubby type of plants present amidst the boulders at an altitude of 3,534 m are *Berberis petiolaris*, *Euphorbia wallichii*, *Cimicifuga foetida* and *Osmunda claytoniana*. The common trees at this altitude are *Betula utilis*, *Syringa persica*, *S. emodi* and species of *Salix*, *Lonicera*, *Jasminum* and *Juniperus*. The ground vegetation consisted chiefly of grasses, *Polygonum affine*, *Androsace sarmentosa*, *Artemisia vulgaris*, *Anemone obtusiloba*, *Fragaria vesca*, *Taraxacum officinale*, *Salvia hians*, *Primula* sp. and a very interesting species of *Arisaema* with characteristic appearance of a cobra with a projecting tongue.

The next phase of the present survey was in the neighbourhood of Khillanmarg situated at an altitude of 3,534 m to 3,667 m. The Marg extends more or less a mile in length. This lovely meadow is subjected to extensive grazing and the area is more or less devoid of plants of tree habit but abounds in herbaceous vegetation, particularly, in the undisturbed regions. Some of the interesting plants collected here are *Chaerophyllum acuminatum*, *Alchemilla vulgaris*, *Thymus serpyllum*, *Aconitum laeve*, *Thalictrum foliolosum*, *Geum elatum*, *Polygonum affine* and species of *Plantago* and *Potentilla*. Besides these herbs one could see in this area tall and vigorously growing *Euphorbia wallichii*, *Fritillaria roylei*, *Rosa macrophylla*, *R. moschata*, *Osmunda claytoniana* and species of *Cynoglossum*, *Iris* and *Dryopteris*. *Arisaema utile*, *A. jacquemontii* and *Anemone* sp. were especially found near the boulders.

Apharwat was visited next and this mountainous area is a ridge, 4,834 m above sea level and situated near Khillanmarg. The vegetation along this ridge was devoid of plants of tree habit. Occasionally, one could see stunted *Betula utilis* and *Juniperus* sp. The journey is very steep with boulders strewn upto a certain altitude. The area was free from snow to a large extent but the presence of small patches of snow was seen at an altitude of 3,767 m. At an altitude of 3,667 m., the plants were the same as represented in the Khillanmarg region. From 3,667 m. to 4,000 m. the alpine vegetation consists of small herbs and stunted woody plant associations. There were encountered *Rhododendron campanulatum* in abundance. The other plants of interest collected at this altitude are *Geranium macrophylla* (not in flowers), *Adonis chrysocyathus*, *Viola biflora* and another species of *Viola*, *Ranunculus lobatus*, *Polygonum affine*, *Androsace sarmentosa*, *Thlaspi alpestre* and species of *Saxifraga*, *Primula*, *Sedum* and *Fritillaria*. From 4,167 m to 4,834 m, the alpine belt of the mountain was covered with small beautiful ground vegetation. Among the picturesque plants of this zone are species of *Allium* and *Primula* (white-flowered). The family Ericaceae is represented by the red flowered *Gaultheria*

trichophylla, *Cassiope fastigiata*, *Rhododendron campanulatum* with fruits and the Crasulaceae by *Sedum tibeticum*, *S. quadrifidum*, *S. rosulatum*. The alpine herbs are *Bergenia ligulata*, *Androsace sarmentosa*, *Gnaphalium luteoalbum*, *Anaphalis cuneifolia*, *Primula nivialis*, *Viola biflora*, *Valeriana wallichii*, *Trigonella emodi*, *Arenaria tenuifolia*, species of *Pedicularis*, *Primula*, *Stachys*, *Euphrasia* and *Viola*. The rare new record for this area is the occurrence of purple flowered *Primula pulchra*, a small herb previously reported from Sikkim himalaya.

On the other side of Apharwat lies the so called frozen lake, Alpathar. This lake is situated at an altitude of 4,000 m. and is surrounded by snow clad mountains. The lake was free from any flowering plants. The vegetation around the lake consisted of the usual alpine plants encountered in other zones.

The next region that occupied our attention was Pahalgam situated at an altitude of 2,667 m. at the junction of the east and west Lidder streams. The place is surrounded by mountains crowned by high meadows. The Lidder valley is situated at the north-eastern corner of the Kashmir Valley. The Lidder streams irrigate the adjoining regions. The main crop plants are Paddy and Maize. Though the region is very much disturbed due to human habitation and cultivation, the area abounds in many interesting plants. Margins of the streams are covered with the shrubby *Myricaria germanica* association, *Sambucus ebulus* and *Viburnum nervosum*. The moist banks and the surrounding regions consisted mostly of herbaceous vegetation. The plants which are common and conspicuous here are *Chenopodium blitum*, *Ranunculus lobatus*, *Prunella vulgaris*, *Trifolium pratense*, *T. repens*, *Rumex nepalensis*, *Mentha sylvestris*, *Delphinium incanum*, *Erysimum altaicum*, *Achillea millefolium*, *Verbascum thapsus*, *Hypericum perforatum*, *Impatiens brachycentra*, *I. sulcata*, *Cichorium intybus*, *Solidago virga-aurea*, and species of *Plantago*, *Cynoglossum*, *Polygonum*, *Epilobium* and *Euphorbia*. Climbing and twining plants are represented by *Codonopsis ovata*, *Convolvulus arvensis* and *Polygonum dumetorum*.

An exploration of the surrounding mountainous region was also made. Baisaran is a glade surrounded by pines and situated at an altitude of 2,900 m. The journey from Pahalgam to Baisaran is very strenuous as the path is very steep. Under the shade of the conifers, the herbaceous vegetation was chiefly represented by *Mentha sylvestris*, *Prunella vulgaris*, *Podophyllum hexandrum*, *Cucubalus bacciferus* and species of *Aquilegia*, *Impatiens*, *Trillium* and *Plantago*. This area presented a rich occurrence of ground Orchids, *Orobanche epithymum* and many saprophytic fungi. Near water courses were found in abundance, *Caltha palustris* and *Galium* sp. The common shrubs are *Phytolacca acinosa*, *Viburnum nervosum* and others.

Proceeding from Pahalgam to Chandanwari, the plants on either side of the east Lidder stream were collected. The vegetation was the same as that represented near Pahalgam.

The next phase of the exploration was in the Kolohai glaciers, the source of the west Lidder stream. The journey was performed step by step, exploring the adjoining areas and following the west Lidder stream upto Aru, a village, seven miles from Pahalgam. The dominant plants of this area are *Mentha arvensis*, *Viburnum nervosum*

parasitised by a species of *Cassytha* and species of *Aquilegia* and *Geranium*. This exploration was continued upto Lidderwat situated at 3,167 m. where the vegetation was more or less the same as that seen between Pahalgam and Aru.

A camp was next set up at Lidderwat and the surrounding mountains and the banks of the Lidder stream were explored. The conifers predominate in this region and the banks of the Lidder stream were fringed with *Rumex nepalensis*, *Angelica glauca* and species of *Epilobium*, *Valeriana* and *Equisetum*. The conspicuous herbaceous vegetation near the water courses includes *Cnicus falconeri*, *Angelica glauca* and *Sambucus ebulus*. The mountains around Lidderwat range from 3,334 to 4,334 m. Some of these are very striking in that they support beautiful meadows with many alpine plants. Among them may be mentioned *Morina longifolia*, *Carduus nutans*, *Corydalis gowaniana*, and species of *Arisaema*. Parasitic *Orobanche epithymum* was in abundance.

The exploration of Lidderwat was followed by a march towards the Kolohai valley. The path was a winding one with boulders of different sizes around which the plant life was rich. Collection in this region included *Valeriana hardwickii*, *V. Officinalis*, *Artemisia moorcroftiana* and species of *Epilobium*, *Iris* (purple flowers) and *Marchantia*.

Considerable time was spent in botanising in the Kolohai valley. The valley is situated at an altitude of 4,164 m. and is surrounded by precipitous mountains. These are covered by *Betula utilis* and *Juniperus recurva*, though the prominent conifers are absent. The valley is drained by a glacial stream and supports a rich herbaceous vegetation. One can see the association of *Corydalis gowaniana* and a species of *Pedicularis* in the small islets formed by the stream. The margins of the stream are clothed by *Angelica glauca*, *Impatiens brachycentra*, *Chenopodium blitum*, *Mentha* sp., *Caltha palustris*, *Pedicularis* sp. with red, white, pale rosy and yellow coloured flowers, and *Primula macrophylla*. The valley abounds in *Senecio chrysanthemoides*, *Rumex nepalensis*, *Taraxacum officinale*, *Euphorbia prolifera*, *Sedum quadrifidum*, *Androsace sarmentosa*, *Saxifraga flagellaris*, *Sambucus ebulus* and species of *Ranunculus*, *Plantago*, *Stellaria* and a purple flowered *Aquilegia*. The path leading to the source of glaciers was strewn with boulders and amidst these were found *Meconopsis aculeata*, *Oxyria digyna*, *Epilobium longifolia*, *Lychnis indica*, *Epilobium latifolium* and *E. angustifolium*.

The base of the glacial mountain was devoid of any plants though one could see patches of yellow coloured lichens on the boulders upto a height of 5,000 m. The mountains on all sides of the valley exhibited practically same alpine plants as were observed elsewhere. The downward journey to Lidderwat was performed on the same day as the one on which the ascent was made as it was impossible to camp there during the night in the absence of alpine equipment.

On the return journey from Pahalgam to Srinagar, a few hours were spent at Kokernag where the beautiful Himalayan Peony—*Paeonia emodi* and *Artemisia vulgaris* were collected.

Returning to Srinagar, the surroundings of the Shankaracharya Hills (Takht-i-Sulaiman) were explored. This is a small hill and the plant life is very scanty and very much disturbed. The yellow flowered *Linaria dalmatica*, *Zizyphus vulgaris*, *Taraxacum officinale*, *Prunella vulgaris* and species of *Polygonum*, *Artemisia*, *Thymus* and *Impatiens*

were collected. The shrubby plants of this region are *Daphne oleoides*, *Berberis vulgaris*, and species of *Rubus*, *Cotoneaster* and *Rosa*. Among the introduced plants, *Robinia pseud-acacia* seemed to be thriving well. *Cuscuta approximata* parasitising a small herb, *Thymus serpyllum* and a few xerophytic ferns present in the crevices of rocks were also collected from this region.

The third and last part of the present exploration was confined to the Sindh Valley. The vegetation along the route upto Sonamarg presented some very characteristic plants. The valley was rich in herbaceous flora and some of the associations met with here were *Sambucus ebulus* with shield-like umbellate inflorescences and bearing red fruits, snow-white branches of *Spiraea* sp. and *Viburnum nervosum*. Of the herbs, the notable ones are *Caltha palustris*, *Lavatera kashmeriana*, *Myricaria germanica* and species of *Impatiens*, *Epilobium* and *Delphinium*. The other plants present here were the usual ones noticed elsewhere near the water courses.

The adjoining areas are very fertile and one can see cherries, walnuts and peaches cultivated on a large scale. The valley supports on either side rich pine forests.

Sonamarg is situated at an altitude of 3,134 m., and presents a beautiful scenery all round. This area is an extensive meadow with glacial mountains all round. The flora from Sonamarg to the foot of the Thajwas glaciers was then explored. At 3,334 m. were collected *Valeriana officinalis* and species of *Impatiens*, *Polygonum*, *Allium*, *Gentiana*, *Spiraea* and *Epilobium*. Apart from the conifers, the other trees of this region are *Acer caesium*, *Parrotia jacquemontiana* and *Sterculia* sp. The Thajwas valley at 3,667 m. supported very rich vegetation mostly herbaceous. The edges of the valley are fringed with *Betula utilis* upto 4,167 m., beyond which the tree-line ends.

The foot of the Thajwas glaciers abounds in rapidly moving streams. The path to the glaciers was covered with boulders and a number of streamlets were also met with. The conspicuous vegetation of this region includes the *Sambucus ebulus* association and the tall *Senecio chrysanthemoides* with the yellow inflorescences. *Rumex nepalensis* and *Taraxacum officinale* were also found here.

The glacial herbaceous vegetation was explored upto a height of 4,500 m. beyond which no plant life existed in the glacial region. Near the streams and in islets were the characteristic alpine plants including the various species of *Corydalis*, *Pedicularis*, *Epilobium*, *Primula*, *Potentilla*, *Polygonum*, *Oxyria*, *Impatiens*, etc. Other interesting plants collected from this region are *Alchemilla vulgaris*, *Thalictrum foliolosum*, *Codonopsis ovata*, *Ranunculus lobatus*, *Trifolium repens*, *Prunella vulgaris*, *Phlomis spectabilis*, *Capsella bursa-pastoris*, *Arisaema utile*, *Malva sylvestris*, *Lotus corniculatus* and species of *Aquilegia*, *Arenaria*, *Impatiens*, *Sedum* and *Stachys*. Parasitic *Cuscuta* and *Viburnum nervosum* was also collected.

ASPECTS AND DISTRIBUTION OF FLORA.

The present exploration was conducted during the months of June and July and the following brief account indicates the salient aspects of the flora during these months. Botanically, the State falls into three regions each presenting its own characteristic type

of vegetation. The dominating vegetation includes the deodars, firs, pines and broad leaved deciduous and evergreen trees. In the Kashmir Valley, *Cedrus deodara* is well distributed and extends between the altitudes 2,000 and 3,167 m. Next comes the blue pine, *Pinus wallichiana* extending from 2,000 to 3,334 m., and often these are mixed up with *Cedrus deodara*. Bordering the valley, at slightly higher elevations, one can see the mixed forests of broad leaved deciduous trees and conifers. Of the conifers, *Pinus roxburghii* is absent in the Valley area whereas *Cedrus deodara* and *Pinus wallichiana* are well represented. Among the broad leaved trees, the notable ones are *Juglans* sp. (wild walnut), *Acer caesium*, *Aesculus indica*, *Platanus orientalis* (introduced), *Parrotia Jacquemontiana*, *Salix* sp. and other cultivated fruit trees. Most of the deciduous trees are utilised for charcoal and firewood. The Valley and its adjacent areas are very much disturbed due to human habitation and considerable damage has been done in the forests on account of felling and grazing.

Leaving the Valley forests, as one climbs higher and higher, the dominating conifers are *Cedrus deodara*, *Pinus wallichiana*, *Abies pindrow*, *Picea smithiana*, and *Taxus baccata*. It has been noticed that *Pinus wallichiana* extends from 2,000 to 3,334 m. whereas the Silver Fir has its dominance at 2,667 to 3,667 m. The presence of *Cedrus deodara* can be noticed upto 3,000 m. Beyond 3,667 m. the giant conifers are replaced by stunted Junipers. The forest vegetation beyond 3,667 m. is chiefly composed of stunted *Salix* sp. *Rhododendron* spp. *Juniperus recurva* and *Betula utilis*.

The mountains represent the coniferous belt as all of them exhibit a dominance of conifers. Under the shade of these conifers the herbaceous and shrubby vegetation is very well developed. In the fir forests of Gulmarg, the species of *Salix*, *Lonicera* and *Skimmia* are found with *Viburnum nervosum*, *Sambucus ebulus*, *Phytolacca acinosa*, *Rosa moschata*, *R. macrophylla* and *Indigofera* sp. forming the conspicuous elements among the shrubby undergrowth. The same species are found in all the mountain forests and some of them extend upto an altitude of 3,667 m. The herbaceous vegetation of the mountains presents a wide variety of plants of economic importance. Their distribution extends to all forests of the higher altitudes.

The sub-alpine zone extends from 3,000 to 4,167 m. and here are found species of *Rosa*, *Rhododendron*, *Juniperus* and *Betula utilis*.

The Alpine zone extends from 4,167 to 5,000 m. followed by regions of glaciers or of perpetual snow. The herbaceous vegetation presents plants of temperate regions. Many genera and species characteristic of temperate countries are well represented in this zone. They dominate the ground with their vivid colours. They are also widely distributed and sometimes form dense mats covering every inch of space. This zone is the target for sheep grazers but inspite of it, one can see many plants of economic and medicinal interest.

A salient feature of the Valley area is the occurrence of many beautiful lakes. The vegetation of these lakes is full of interest. The Hydrophytic formations are characteristically seen here. Margins of the lakes present species of *Salix*, *Populus* and sometimes *Juglans*. They are followed by the beautiful Lotus and Water Lilies. These form a distinctive feature of all lakes irrespective of the size. The submerged aquatic plants are not uncommon and cover a good portion of the lakes. The 'floating gardens'

of Dal Lake are worthy of attention. These are utilised by people to grow vegetables for daily use. The shallow regions of the lakes are converted into *demb* lands for the cultivation of vegetables. The *demb* lands are supported by willows and poplars and marshy weeds with mud slightly raised above the general water level. A rich variety of vegetables is supported here because everything that plant life requires is present in these man made patches of land. The important hydrophytes are *Trapa bispinosa*, which yields the 'Singhara', species of *Nymphaea*, *Nelumbo*, *Euryale*, *Acorus* and *Typha*. Besides, the swampy weeds are said to be highly nutritious for cattle and sheep.

Of the several high altitude lakes only the Alpathar lake visited during the present exploration, situated at an altitude of 4,000 m. was completely devoid of flowering plants.

SYSTEMATIC CENSUS

Ranunculaceae

Clematis connata DC. FBI. 1:6.

Local name: BIRDI.

A large woody climber with white attractive flowers.

Ferozepur Nalah, T. A. Rao, No. 354, Alt. 2600 m.

Tangmarg.

Clematis grata Wall. FBI. 1:3.

Local name: ALASH.

A woody climber with white and cream colored attractive flowers.

Srinagar, T. A. Rao, No. 846, Alt. 2600 m.

Sindh Valley & Ferozepur Nalah.

Anemone falconeri Thoms. FBI. 1:8.

An erect herb with radiate leaves and golden yellow flowers.

Lidderwat, T. A. Rao, No. 689, Alt. 3600 m.

Kolohai Valley.

Anemone obtusiloba Don. FBI. 1:8.

An erect herb with white or blue-tinged flowers near water courses. The roots and seeds yield medicinal oil used locally for massage.

Gulmarg, T. A. Rao, Nos. 210, 278, Alt. 3000 m.

Kolohai valley, Lidderwat & Khillanmarg.

Anemone tetrasepala Royle. FBI 1:10.

A robust herb with white flowers.

Gulmarg, T. A. Rao, No. 288, Alt. 3200 m.

Khillanmarg.

Thalictrum elegans Wall. FBI. 1:10.

A small tender herb with small green flowers and flat green fruits.

Lidderwat hill tops, T. A. Rao, No. 703, Alt 3200 m.

Thalictrum foliolosum DC. FBI 1:14.

A tall herb with greenish flowers.

Pahalgam, T. A. Rao, No. 539, Alt. 2660 m.

Aru, Lidder valley, Gulmarg.

Thalictrum minus L. FBI. 1:14.

A tall slender herb with dingy purple flowers.

Gulmarg, T. A. Rao, No. 275, Alt. 3200 m.

Thalictrum reniforme Wall. FBI. 1:11.

A much branched erect herb with small greenish white flowers.

Ferozepur Nalah, T. A. Rao, No. 364, Alt. 2630 m.

Drang.

Adonis chrysoyathus H.f. & T. FBI. 1:15.

An erect herb with golden yellow flowers. The root is said to be poisonous.

Gulmarg, T. A. Rao, No. 459, Alt. 3600 m.

Apharwat, Khillanmarg.

Ranunculus arvensis L. FBI. 1:20.

An annual erect herb with yellow flowers.

Tangmarg, T. A. Rao, No. 209, Alt. 3000 m.

Gulmarg.

Ranunculus trichophyllus Chaix.

Syn. *Ranunculus aquatilis* L. var. *trichophyllus* H. & T. FBI. 1:16.

Local name: HILL. (Persian) Tohlab.

An aquatic plant with submerged capillary leaves and white flowers. Used medicinally for boils.

Pahalgam, T. A. Rao, No. 548, Alt. 2530 m.

Lidder valley, Sindh valley, Achabal, Kokernag & Srinagar.

Ranunculus hyperboreus Rotth. FBI. 1:18.

A small herb with stolons; small yellow flowers.

Gulmarg, T. A. Rao, No. 482, Alt. 3700 m.

Apharwat, Lidderwat.

Ranunculus hirtellus Royle. FBI. 1:18.

An alpine tender herb with golden yellow flowers.

Lidder Valley, T. A. Rao, No. 690, Alt. 3600 m.

Kolohai Valley & Apharwat.

Ranunculus laetus Wall. FBI. 1:19.

Local name: KHAND VADA.

An erect herb in moist places with white turions and yellow flowers.

Tangmarg, T. A. Rao, Nos. 66, 13, Alt. 2500 m

Gulmarg.

Ranunculus lobatus Jacq. FBI. 1:17.

A small decumbent herb amidst moist grassy fields with yellow flowers. Resembles alpine forms of *R. hirtellus* Royle.

Tangmarg, T. A. Rao, No. 207, Alt. 3000 m

Gulmarg, Khillanmarg & Apharwat.

Ranunculus pulcnellus C.A. Mey. FBI. 1:17.

An erect herb with whitish purple flowers.

Lidderwat, T. A. Rao, No. 644, Alt. 3160 m.

Lidder Valley & Kolohai.

Caltha palustris Linn. FBI. 1:21.

An aquatic herb with white flowers.

Gulmarg, T. A. Rao, Nos. 241, 259, 595, Alt. 3000—3500 m.

Pahalgam & Sindh Valley.

Aquilegia pubiflora Wall. FBI. 1:24.

A moist loving erect herb with white flowers.

Gulmarg, T. A. Rao, Nos. 392, 269, Alt. 2600 m.

Drang & Ferozepur Nalah.

Aquilegia vulgaris Wall. FBI. 1:24.

An erect deep rooted herb with purple and pale whitish purple flowers.

Pahalgam, T. A. Rao, Nos. 673, 565, Alt. 3500 m.

Aru, Lidderwat & Gulmarg.

Delphinium incanum Royle. FBI. 1:25.

An erect herb with deep blue flowers.

Pahalgam Valley, T. A. Rao, Nos. 735, 845, Alt. 2500 m.

Srinagar.

Aconitum heterophyllum Wall. FBI. 1:29.

Local name: ATEES.

An erect herb with blue-green flowers. Tonic prepared from roots.

Gulmarg, T. A. Rao, No. 238, Alt. 3600 m.

Khillanmarg.

Aconitum laeve Royle. FBI. 1:28.

An erect herb with whitish-purple flowers.

Gulmarg, T. A. Rao, Nos. 247, 396, Alt. 2834 m.

Khillanmarg, Apharwat & Lidderwat.

Actaea spicata Linn. FBI. 1:29.

An erect perennial herb with small white racemes.

Gulmarg, T. A. Rao, Nos. 239, 596, Alt. 2900, 3500 m.

Khillanmarg, Pahalgam & Baisaran.

Paeonia emodi Wall. FBI. 1:30.

Local name: NAMEKH, MID.

An erect herb with large white flowers.

Kokernag, T. A. Rao, No. 748, Alt. 2300 m.

Achabal & Pahalgam.

Berberidaceae

Berberis umbellatus Wall. FBI. 1:110.

An erect shrub in fruits (greenish white).

Srinagar, T. A. Rao, No. 774, Alt. 2000 m.

Tangmarg & Gulmarg.

Berberis petiolaris Wall. FBI. 1:110.

An erect spreading shrub in fruits.

Gulmarg, T. A. Rao, Nos. 283, 187, Alt. 3000—3500 m.

Khillanmarg.

Epimedium elatum Morr. & Decne. FBI. 1:112.

Local name : MACHARMAR.

A slender tall herb with small white flowers. The plant is used to expel and kill mosquitoes.

Gulmarg, T. A. Rao, No. 384, Alt. 3000 m.

Drang.

Podophyllum hexandrum Royle. 111. 64.

Syn. *Podophyllum emodi* Hk.f. in part non Wall. FBI. 1:112.

An erect stout herb with ellipsoid edible berries. Resins from roots are medicinal.

Gulmarg, T. A. Rao, Nos. 237, 582, Alt. 2900—4500 m.

Khillanmarg, Pahalgam, Baisaran & Lidderwat.

Nymphaeaceae

Nymphaea alba Linn. FBI. 1:114.

Local name: BUMPASH.

An aquatic herb with floating leaves and aerial white flowers

Dal, T. A. Rao, No. 757, Alt. 1900 m.

Nagin, Manasbal and Wular lakes.

Nelumbo nucifera Gaertn.

Syn. *Nelumbium speciosum* Willd. FBI. 1:116.

An aquatic herb with milky juice. Leaves and flowers raised above water level. Flowers white-yellow, pink-white, rose-red. Seeds edible.

Dal, T. A. Rao, Nos. 763, 829, Alt. 1900—2200 m.

Nagin, Manasbal and Wular lakes.

Euryale ferox Salisb. FBI. 1:115.

An aquatic prickly herb with leaves having spiny ribs.

Dal, T. A. Rao, No. 764, Alt. 1900 m.

Nagin lakes.

Papaveraceae

Meconopsis aculeata Royle. FBI. 1:118.

An erect prickly herb with blue-purple flowers.

Lidderwat, T. A. Rao, Nos. 675, 708, Alt. 3660—4000 m.

Kolohai valley & Lidder valley.

Fumariaceae

Corydalis falconeri H. & T. FBI. 1:124.

A tall herb with yellow flowers.

Gulmarg, T. A. Rao, No. 263, Alt. 3100 m.

Khillanmarg.

Corydalis govaniiana Wall. FBI. 1:124.

Local name: VANSHATAR.

A herb near streams with yellow flowers in racemes.

Herb medicinal.

Kolohai valley, T. A. Rao, Nos. 796, 732, 686, 706, Alt. 3000—4500 m.

Lidder valley & Lidderwat.

Corydalis moorcroftiana Wall. FBI. 1:125.

An erect herb with yellow flowers.

Pahalgam, T. A. Rao, No. 619, Alt. 2700—3000 m.

Chandunwari.

Cruciferae

Rorippa indica (L.) Hochreut.

Syn. *Nasturtium indicum* DC. FBI. 1:134.

An erect annual in damp places with small yellow flowers.

Ferozepur Nalah, T. A. Rao, No. 366, Alt. 2600 m.

Drang & Tangmarg.

Nasturtium montanum Wall. FBI. 1:134.

An annual herb with small pinkish white flowers.

Thajwas glaciers, T. A. Rao, No. 810, Alt. 3300 m.

Sindh Valley.

Nasturtium officinale Br. FBI. 1:133.

A much branched amphibious herb with pale yellow flowers.

Lidder valley, T. A. Rao, Nos. 511, 676, Alt. 2600 m.

Pahalgam & Lidderwat.

Nasturtium palustre DC. FBI. 1:133.

A semi erect herb with small yellow flowers.

Tangmarg, T. A. Rao, Nos. 124, 78, 560, Alt. 2400 m.

Gulmarg, Pahalgam & Lidder valley.

Arabis pterosperma Edgew. FBI. 1:135.

An erect small annual herb with small pink flowers.

Khillanmarg, T. A. Rao, Nos. 274, 446, Alt. 3367 m.

Apharwat, Gulmarg & Tangmarg.

Turritis glabra L.

Syn. *Arabis glabra* Crantz. FBI. 1:135.

A herb with small white flowers.

Tangmarg, T. A. Rao, No. 60, Alt. 2430 m.

Gulmarg & Pahalgam.

Arabis tibetica H.f. & T. FBI. 1:136.

A perennial much branched erect herb with white flowers.

Tangmarg, T. A. Rao, Nos. 451, 652, Alt. 3500 m.

Gulmarg, Chandanwari & Lidderwat.

Cardamine impatiens Linn. FBI. 1:138.

An erect annual herb with pale pink or pale reddish-white flowers

Tangmarg, T. A. Rao, Nos. 246, 125, 567, Alt. 3430 m.

Gulmarg, Khillanmarg, Apherwat & Aru.

Cardamine macrophylla Willd. FBI. 1:139.

An erect perennial herb with large white flowers.

Gulmarg, T. A. Rao, No. 261, Alt. 3160 m.

Khillanmarg.

Draba glacialis Adam. FBI. 1:142.

A small tufted herb with small yellow flowers.

Apherwat, T. A. Rao, No. 488, Alt. 3730 m.

Khillanmarg & Gulmarg.

Sisymbrium brassiciforme C.A.M.

Syn. *Sisymbrium columnae* Jacq. FBI. 1:150.

An erect tall annual herb with white flowers.

Tangmarg, T. A. Rao, No. 44, Alt. 2400 m.

Gulmarg.

Sisymbrium himalaicum H.f. & T. FBI. 1:147.

An erect much branched herb with small white racemes.

Apherwat, T. A. Rao, No. 466, Alt. 4300 m.

Khillanmarg.

Descurainia sophia (L.) Webb.

Syn. *Sisymbrium sophia* L. FBI. 1:150.

An erect annual herb with small yellow flowers.

Khillanmarg, T. A. Rao, No. 445, Alt. 2400 m.

Apherwat.

***Erysimum altaicum* Mey. FBI. 1:154.**

An erect herb with vermilion colored small flowers.

Pahalgam, T. A. Rao, Nos. 540, 819, Alt. 2530 m.

Lidder valley, Sindh valley & Sonamarg.

***Brassica campestris* L. FBI. 1:156.**

A cultivated erect herb with yellow flowers

Tangmarg, T. A. Rao, No. 371, Alt. 2600 m.

Ferozepur Nalah & Drang.

***Capsella bursa-pastoris* (L.) Medik.**

A much branched herb with small white flowers.

Tangmarg, T. A. Rao, Nos. 111, 632, 91, 136, Alt. 2400 m.

Gulmarg & Chandanwari.

***Lepidium ruderale* L. FBI. 1:160.**

A glabrous erect annual with small white flowers.

Cultivated.

Yarikhah, T. A. Rao, No. 198, Alt. 2400 m.

Tangmarg, Gulmarg, Sindh & Lidder valley.

***Thlaspi calaminare* Laj. & Court.**

Syn. *Thlaspi alpestre* L. FBI. 1:162.

An erect tufted herb with large white flowers.

Gulmarg, T. A. Rao, Nos. 243, 485, Alt. 3100 m.

Khillanmarg, Agharwat & Lidderwat.

***Iberidella andersonii* H.f. & T. FBI. 1:163.**

An erect small herb with small white or pale rose flowers.

Agharwat, T. A. Rao, No. 485, Alt. 4100 m.

Khillanmarg.

Violaceae

***Viola arenaria* DC.**

A small tufted herb with purple flowers.

Khillanmarg, T. A. Rao, No. 490, Alt. 4100 m

Agharwat.

***Viola biflora* L. FBI. 1:182.**

A small herb with purple flowers.

Khillanmarg, T. A. Rao, Nos. 490, 479, Alt. 4100 m.

Agharwat.

***Viola caespitosa* D. Don.**

Syn. *Viola patrinii* DC. FBI. 1:183.

A small herb with stunted stem in the rocky crevices with capsules (not in flowers).

Pahalgam, T. A. Rao, No. 602, Alt. 3100 m

Lidder Valley & Chandanwari.

Viola serpens Wall. FBI. 1:184.

A stoloniferous herb with split fruits (no flowers).

Drang forest, T. A. Rao, Nos. 592, 383, Alt. 2900 m.

Baisaran.

Polygalaceae*Polygala abyssinica* Fresen. FBI. 1:202.

An erect perennial herb with small light pink flowers.

Chandanwari, T. A. Rao, No. 625, Alt. 2700 m.

Sindh Valley & Lidder Valley.

Caryophyllaceae*Dianthus crinitus* Smith. FBI. 1:215.

A suffruticose herb with white flowers.

Tangmarg, T. A. Rao, No. 346, Alt. 2600 m.

Ferozepur Nalah.

Dianthus jacquemontii Edgew. FBI. 1:214.

A tufted slender herb with white flowers in rocky places.

Yarikhah, T. A. Rao, No. 188, Alt. 2500 m.

Tangmarg & Pahalgam.

Gypsophila cerastioides Don. FBI. 1:217.

A small perennial decumbent or prostrate herb with white flowers showing pinkish marks on the corolla.

Hill tops of Lidderwat, T. A. Rao, No. 692, Alt. 3600 m.

Saponaria vaccaria Linn. FBI. 1:217.

A tall erect herb with rosy flowers.

Chandanwari, T. A. Rao, No. 612, Alt. 2700 m.

Pahalgam.

Silene inflata Sm. FBI. 1:218.

An erect perennial herb with white flowers.

Tangmarg, T. A. Rao, Nos. 110, 350, Alt. 2400 m.

Gulmarg.

Silene indica L. FBI. 1:225.

A tall green herb with white flowers.

Tangmarg, T. A. Rao, No. 400, Alt. 2600 m.

Drang forest.

***Cucubalus baccifera* L. FBI. 1:222.**

A trailing herb with inflated fruits.

Pahalgam, T. A. Rao, No. 574, Alt. 2900 m.

Aru, Balsaran.

***Lychnis apetala* L. FBI. 1:222.**

A small tufted herb with pale purple flowers.

Gulmarg, T. A. Rao, Nos. 294, 264, Alt. 3100 m.

Khillanmarg.

***Lychnis coronaria* Lamk. FBI. 1:222.**

Local Name: ANGARDA.

A sparingly branched white hoary herb with pinkish flowers.

Yarikhah, T. A. Rao, No. 345, Alt. 2300 m.

Tangmarg, Ferozepur Nalah & Drang.

***Lychnis indica* Benth. FBI. 1:225.**

A tall weak erect herb with pale greenish white flowers.

Chandanwari, T. A. Rao, No. 617, Alt. 2600 m.

Lidder valley.

***Cerastium dahuricum* Fisch. FBI. 1:227.**

A tall perennial slender herb with white flowers.

Gulmarg, T. A. Rao, Nos. 230, 233, Alt. 3000 m.

Khillanmarg.

***Cerastium vulgatum* L. FBI. 1:228.**

An erect or sub-erect slender herb with white flowers.

Aru, T. A. Rao, Nos. 566, 83, 143, 205, Alt. 2630 m.

Gulmarg & Tangmarg.

***Cerastium trigynum* Vill. FBI. 1:227.**

A perennial tufted grass-like herb with white flowers.

Khillanmarg, T. A. Rao Nos. 682, 484, Alt. 3600 m.

Apharwat, Hill-tops of Lidderwat.

***Stellaria aquatica* Scop. FBI. 1:229.**

A trailing herb with white flowers.

Gulmarg, T. A. Rao, No. 234, Alt. 3000 m.

Khillanmarg.

***Stellaria crispata* Wall. FBI. 1:229.**

A tall spreading herb in swampy moist places (no flowers).

Gulmarg, T. A. Rao, No. 251, Alt. 3130 m.

Khillanmarg.

***Stellaria decumbens* Edgew. FBI. 1:234.**

A tufted prostrate herb with white flowers.

Apharwat, T. A. Rao, Nos. 489, 724, Alt. 3700 m.

Khillanmarg, Kolohai glacial valley.

***Stellaria media* Linn. FBI. 1:229.**

A much branched procumbent stem with flowers in cymes and found in damp places.

Gulmarg golf field, T. A. Rao, No. 216, Alt. 3060 m.

Khillanmarg.

***Stellaria paniculata* Edgew. FBI. 1:229.**

An erect or sub-erect tender herb with white flowers.

Chandanwari, T. A. Rao, No. 628, Alt. 3100 m.

Lidder valley.

***Arenaria ciliolata* Edgew. FBI. 1:240.**

A prostrate herb with white flowers.

Lidder Valley, T. A. Rao, No. 724, Alt. 4000 m.

Kolohai glaciers.

***Arenaria neelgerensis* W. & A. FBI. 1:239.**

A small tufted herb with small white flowers.

Gulmarg golf field, T. A. Rao, Nos. 222, 402, Alt. 3100 m.

Babarishi.

***Arenaria serpyllifolia* L. FBI. 1:239.**

A small tufted decumbent tender herb with white flowers and found on damp soil.

Pahalgam, T. A. Rao, Nos. 503, 562, Alt. 2600 m.

Aru & Baisaran.

***Arenaria tenuifolia* Linn.**

A small tufted herb with pinkish white flowers in damp places amidst grasses.

Aru, T. A. Rao, Nos. 554, 219, Alt. 2600 m.

Gulmarg.

***Sagina procumbens* L. FBI. 1:242.**

A small procumbent herb amidst grasses with white flowers.

Yarikhah, T. A. Rao, Nos. 123, 554, 160, Alt. 2300 m.

Tangmarg.

***Spergularia rubra* (L.) Pers.**

Syn. Spargula rubra L. FBI. 1:244.

A sub-erect herb amidst grasses with small white flowers.

Gulmarg golf field, T. A. Rao, No. 218, Alt. 2400 m.

Synmaria cordata Wall. FBI. 1:244.

A spreading sub-erect branching herb with minute flowers found in crevices of rocks.
Ferozepur Nalah, T. A. Rao, No. 386, Alt. 3000 m.
Drang Forest.

Tamaricaceae

Myricaria germanica Desv. FBI. 1:250.

Local name: CHAATIKAR.

A semi-aquatic shrub with whitish pink racemes near streams.
Ferozepur Nalah, T. A. Rao, Nos. 541, 375, Alt. 2500 m.
Sindh and Lidder valleys.

Hypericaceae

Hypericum napaulense Choisy. FBI. 1:256.

A weak semi-prostrate herb with yellow flowers. Near running water.
Lidderwat hill tops, T. A. Rao, No. 640, Alt. 3160 m.

Hypericum perforatum Linn. FBI. 1:255.

An erect slender herb, sometimes trailing with scented yellow flowers.
Yarikhah, T. A. Rao, Nos. 9, 59, Alt. 2400 m.
Tangmarg, Gulmarg, Pahalgam & Lidderwat.

Malvaceae

Lavatera kashmiriana Camb. FBI. 1:319.

Local name: GUNKHER.

A branching tall erect herb with rosy or whitish pink flowers.
Pahalgam, T. A. Rao, No. 738, Alt. 2500 m.
Ferozepur Nalah & Drang forests.

Malva rotundifolia L. FBI. 1:320.

Local name: GUL-I-KHADMI.

A spreading herb near moist places with small white flowers.
Tangmarg, T. A. Rao, No. 338, Alt. 2500 m.
Drang, Ferozepur Nalah.

Malva verticillata L. FBI. 1:320.

Local name: KHACHCHAL.

An erect tall herb with small white flowers. Seeds are added to sharbat locally.
Chandanwari, T. A. Rao, No. 631, Alt. 2400 m.
Yarikhah & Ninglinalah.

Hibiscus trionum L. FBI. 1:334.

A small erect herb with yellow flowers.
Yarikhah, T. A. Rao, No. 447, Alt. 2400 m.
Ninglinalah.

Linaceae

Linars Vitatissimum L. FBI. 1:410.

Local name: ALISH.

Tall erect herb white-blue flowers. Cultivated for oil.

Yarikhah, T. A. Rao, Nos. 150, 114, Alt. 2900 m.

Tangmarg, Ferozepur Nalah.

Geraniaceae

Geranium grevilleanum Wall. FBI. 1:430.

A tall erect herb with whitish violet flowers.

Gulmarg, T. A. Rao, Nos. 290, 461, Alt. 3500 m.

Khillanmarg & Agharwat.

Geranium nepalense Sweet. FBI. 1:430.

A slender spreading herb on slopy wet soil with pink flowers.

Yarikhah, T. A. Rao, Nos. 38, 132, Alt. 2400 m.

Tangmarg, Gulmarg.

Geranium pratense L. FBI. 1:429.

A stout erect herb with deep pink large flowers.

Lidderwat hill-tops, T. A. Rao, No. 674, Alt. 3500 m.

Geranium robertianum Linn. FBI. 1:432.

A small branching annual herb with pale pinkish flowers.

Baisaran, T. A. Rao, No. 590, Alt. 2500 m.

Pahalgam.

Geranium wallichianum Sw. FBI. 1:430.

A herb with purple flowers.

Yarikhah, T. A. Rao, Nos. 86, 52, Alt. 2400 m.

Tangmarg.

Erodium cicutarium (L.) L'Herit. FBI. 1:434.

A small herb with pinkish or purple flowers.

Pahalgam, T. A. Rao, Nos. 742, 790, 328, Alt. 2460 m.

Gulmarg golf field, Shankaracharya Hill.

Oxalis acetosella L. FBI. 1:436.

A stemless creeping herb with long petioles. Not in flowers.

Ninglinalah, T. A. Rao, No. 428, Alt. 2500 m.

Babarishi.

Oxalis corniculata L. FBI. 1:436.

A diffuse prostrate herb with yellow flowers.

Yarikhah, T. A. Rao, Nos. 40, 561, 68, 138, Alt. 2460 m.

Ferozepur Nalah, Tangmarg, Aru & Pahalgam.

Impatiens brachycentra Kar. & Kir. FBI. 1:481.

An erect tender herb with small white flowers.

Yarikhah, T. A. Rao, Nos. 33, 134, 365, Alt. 2400 m.

Ninglinalah, Drang, Gulmarg, Sonamarg, Pahalgam & Chandanwari.

Impatiens edgeworthii Hook. f. FBI. 1:476.

A tall herb with white flowers.

Drang Forest, T. A. Rao, Nos. 99, 559, Alt. 2400 m.

Yarikhah, Aru & Ninglinalah.

Impatiens glandulifera Royle.

Syn. *Impatiens roylei* Walp. FBI. 1:468.

A tall robust herb with pale yellow flowers.

Ninglinalah, T. A. Rao, No. 432, Alt. 2300 m.

Pahalgam.

Impatiens gigantea Edgew.

Syn. *Impatiens sulcata* Wall. FBI. 1:469.

A tall stout erect herb with large yellow flowers.

Khillanmarg, T. A. Rao, No. 801, Alt. 3333 m.

Sonamarg glaciers, Lidderwat & Kolohai glaciers.

Rutaceae

Skimmia lauroleola Sieb. & Zucc.

A small aromatic shrub with white flowers. Ess. Oil.

Gulmarg fir forests, T. A. Rao, No. 168, Alt. 2800 m.

Tangmarg.

Celastraceae

Euonymus hamiltonianus Wall. FBI. 1:612.

Local Name: CHHUL. Gurjar: SHAKI.

A small tree with fruits. Used for fodder.

Gulmarg, T. A. Rao, No. 332, Alt. 2600 m.

Khillanmarg & Pahalgam.

Rhamnaceae

Zizyphus vulgaris Lamk. FBI. 1:633.

A small tree with greenish white flowers and fruits.

Srinagar, T. A. Rao, Nos. 778, 847, Alt. 1800 m.

Shankaracharya Hill.

Sapindaceae

Acer caesium Wall. FBI. 1:695.

Local name: KANJAL, TILPATR, BAGADOO.

A big tree, 50—80 ft. Fruits with wings.

Gulmarg fir forest, T. A. Rao, No. 250, 3130 m.

Sonamarg.

Aesculus indica Colebr. FBI. 1:675.

A tall tree, 40-80 ft. with reddish brown fruits.

Not in flowers.

Srinagar, T. A. Rao, No. 821, Alt. 1800 m.

Gulmarg & Pahalgam.

Leguminosae*Trifolium pratense* Linn. FBI. 2:86.

An erect herb, small red flowers.

Yarikhah, T. A. Rao, No. 1, Alt. 2430 m.

Tangmarg, Gulmarg & Khillanmarg.

Trifolium repens Linn. FBI. 2:86.

A creeping herb with white flowers in heads.

Yarikhah, T. A. Rao, No. 17, Alt. 2400 m.

Gulmarg, Khillanmarg, Apharwat & Lidderwat.

Trigonella emodi Benth. FBI. 2:88.

A small branching herb with yellow flowers.

Gulmarg, T. A. Rao, Nos. 496, 515, 517, 733, Alt. 2770 m.

Khillanmarg, Pahalgam & Lidderwat.

Trigonella gracilis Benth. FBI. 2:88.

A slender trailing herb with yellow flowers.

Achabal, T. A. Rao, No. 745, Alt. 2300 m.

Melilotus alba Lamk. FBI. 2:89.

A tall robust herb with white flowers.

Babarishi, T. A. Rao, Nos. 422, 530, 532, Alt. 2730 m.

Pahalgam, Shankaracharya hill top & Lidder valley.

Meacago falcata Linn. FBI. 2:90.

A much branched sub-erect herb with small yellow flowers

Ninglinalah, T. A. Rao, Nos. 437, 794, Alt. 2330 m.

Shankaracharya hill top.

Medicago lupulina L. FBI. 2:90.

A prostrate herb in damp soil with yellow flowers.

Yarikhah, T. A. Rao, Nos. 48, 127, Alt. 2400 m.

Tangmarg & Gulmarg.

Lotus corniculatus L. FBI. 2:91.

A slender herb with flowers, orange to golden yellow.

Yarikhah, T. A. Rao, Nos. 35, 14, 557, Alt. 2400 m.

Tangmarg, Aru, Pahalgam, Chandanwari & Baisaran.

***Indigofera atropurpurea* Ham. FBI. 2:101.**

A shrub with woody branches and pinkish flowers.

Ninglinalah, T. A. Rao, No. 433, Alt. 2400 m.

Yarikhah.

***Indigofera gerardiana* Wall. FBI. 2:100.**

Local name: KACHJHAND.

A much branched shrub with pinkish flowers in racemes. Baskets are prepared out of thin branches.

Tangmarg, T. A. Rao, No. 360, Alt. 2600 m.

Ferozepur Nalah & Drang.

***Caragana brevispina* Royle. FBI. 2:116.**

A shrub with yellow flowers.

Ferozepur Nalah, T. A. Rao, No. 360, Alt. 2900 m.

***Astragalus chlorostachys* Lindl. FBI. 2:128.**

A tall branched herb with pale yellow lilac tinged flowered racemes.

Drang forest, T. A. Rao, No. 363, Alt. 2630.

Tangmarg.

***Astragalus himalayanus* Klotz. FBI. 2:126.**

A prostrate herb in damp places with pale purple flowers.

Lidderwat, hill tops, T. A. Rao, No. 645, Alt. 3160 m.

***Astragalus leucocephalus* Grah. FBI. 2:128.**

A caespitose herb with hairy stem and yellow flowers in dense heads on long stalks.

Srinagar, T. A. Rao, No. 792, Alt. 2260 m.

Shankaracharya hill top.

***Lespedeza sericea* Miq. FBI. 2:142.**

An erect herb with slender branches and yellow flowers.

Manasbal lake, T. A. Rao, No. 832, Alt. 2060 m.

Watnub.

***Lespedeza variegata* Camb. FBI. 2:142.**

An erect herb with pinkish white small flowers.

Tangmarg, T. A. Rao, Nos. 324, 777, 614, 796, Alt. 2600 m.

Drang, Chandanwari & Shankaracharya hill.

***Aeschynomene indica* Linn. FBI. 2: 151.**

A branched suffruticose annual with yellow flowers found near paddy fields.

Harwan reserve forest, T. A. Rao, No. 838, Alt. 2060 m.

***Lathyrus aphaca* Linn. FBI. 2:179.**

A slender branching herb with yellow or pale yellow flowers.

Chandanwari, T. A. Rao, No. 623, Alt. 2400 m.

Dolichos lablab Linn. FBI. 2:209.

A twining annual with deep vermillion colored flowers.

Chandanwari, T. A. Rao, No. 624, Alt. 2400 m.

Robinia pseud-acacia L.

A small introduced tree with fruits (not in flowers).

Pahalgam, T. A. Rao, No. 512, Alt. 2600 m.

Shankaracharya hill top.

Rosaceae

Prunus cornuta Wall.

Syn. *Prunus padus* L. FBI. 2:315.

Local name: TSRAIN.

A small tree with greenish fruits (not in flowers).

Thajwas glacial valley, T. A. Rao, No. 818, Alt. 3335 m.

Spiraea canescens Don. FBI. 2:325.

A vigorous woody shrub with small white umbels.

Chandanwari, T. A. Rao, No. 604, Alt. 2400 m.

Pahalgam.

Spiraea lindleyana Wall.

Syn. *Spiraea sorbifolia* L. FBI. 2:324.

Local name: KIDI.

A bushy shrub with small white flowers.

Tangmarg, T. A. Rao, No. 373, Alt. 2600 m.

Ferozepur Nalah, Drang, Pahalgam, Aru & Gulmarg.

Spiraea vestita Wall. FBI. 2:323.

A tall erect herb with white flowers in clusters.

Ferozepur Nalah, T. A. Rao, No. 309, Alt. 2300 m.

Drang forests.

Rubus antennifer Hk.f. FBI. 2:337.

A tall erect shrub with white flowers.

Lidder valley, T. A. Rao, Nos. 525, 741, Alt. 2500 m.

Pahalgam & Sindh valley.

Rubus niveus Thunb.

Syn. *Rubus lasiocarpus* Sm. FBI. 2:339.

A rambling prickly shrub with pale white flowers.

Harwan reserve forest, T. A. Rao, No. 850, Alt. 2067 m.

Rubus gracilis Roxb.

Syn. *Rubus niveus* Wall. FBI. 2:335.

Local name: CHANJ.

A small bushy shrub with red fruits (not in flowers).

Tangmarg, T. A. Rao, No. 325, Alt. 2600 m.

Ferozepur Nalah & Drang forests.

***Rubus pungens* Camb. FBI. 2:341.**

A bushy shrub with red fruits (not in flowers).

Drang, T. A. Rao, No. 382, Alt. 3000 m.

Ferozepur nahah.

***Geum elatum* Wall. FBI. 2:343.**

A prostrate herb with yellow flowers.

Gulmarg, T. A. Rao, Nos. 231, 281, Alt. 3000 m.

Khillanmarg, Aparhat & Kolohai glacial valley.

***Geum urbanum* L. FBI. 2:342.**

Local name: CHEROI.

A tomentose herb with yellow flowers in terminal panicles.

Yarikhah, T. A. Rao, Nos. 15, 197, 505, Alt. 2400 m.

Pahalgam, Lidder valley & Lidderwat.

***Duchesnea indica* (Andr.) Focke.**

Syn. *Fragaria indica* Andr. FBI. 2:343.

A slender hairy prostrate herb with yellow flowers and tasteless attractive fruits.

Yarikhah, T. A. Rao, Nos. 37, 12, Alt. 2400 m.

***Fragaria vesca* L. FBI. 2:344.**

A runner with white flowers and edible fruits.

Yarikhah, T. A. Rao, No. 27, Alt. 2400 m.

Pahalgam, Lidder valley, Drang, Aru, Baisaran & Khillanmarg.

***Potentilla albigolia* Wall. FBI. 2:347.**

A spreading herb with large yellow flowers.

Khillanmarg, T. A. Rao, No. 433, Alt. 3500 m.

Aparhat.

***Potentilla argyrophylla* Wall. FBI. 2:356.**

A tall erect herb, silky white with yellow flowers.

Lidderwat hill tops, T. A. Rao, No. 680, Alt. 3600 m.

***Potentilla argyrophylla* Wall var. *atrosanguinea* FBI. 2:357.**

A silky white herb with large dark crimson flowers.

Gulmarg, T. A. Rao, No. 458, Alt. 3600 m.

Khillanmarg & Aparhat.

***Potentilla nepalensis* Hk. FBI. 2:355.**

An erect herb with crimson red or purple flowers.

Yarikhah, T. A. Rao, Nos. 38, 519, 113, 553, 124, 74, Alt. 2400 m.

Tangmarg, Gulmarg, Pahalgam, Lidder valley & Aru.

***Potentilla supina* L. FBI. 2:359.**

A prostrate or semi-erect herb with yellow flowers.

Yarikhah, T. A. Rao, Nos. 79, 415, Alt. 2500 m.

Tangmarg & Babarishi.

Sibbaldia parviflora Haller.

Syn. *Potentilla sibbaldi* Haller. FBI. 2:345.

A small branching tender herb with small yellow flowers.

Gulmarg golf field, T. A. Rao, Nos. 206, 649. Alt. 3000 m.

Lidderwat.

Alchemilla vulgaris L. FBI. 2:360.

An annual hairy herb with yellow green to pale red flowers.

Aru, T. A. Rao, Nos. 564, 214, Alt. 2500 m.

Gulmarg golf field & Tangmarg.

Agrimonia eupatoria Linn. FBI. 2:361.

A tall erect hairy herb with scented yellow flowers.

Yarikhah, T. A. Rao, No. 81, Alt. 2400 m.

Tangmarg.

Agrimonia pilosa Ledeb. FBI. 2:361.

A tall erect glabrous herb with yellow flowers.

Pahalgam, T. A. Rao, No. 524, Alt. 2500 m.

Rosa macrophylla Lindl. FBI. 2:366.

A prickly shrub with pale red or white flowers.

Tangmarg, T. A. Rao, Nos. 284, 359, Alt. 3500 m.

Gulmarg, Khillanmarg & Drang.

Rosa moschata Mill. FBI. 2:367.

A climbing prickly shrub with yellowish white flowers.

Gulmarg, T. A. Rao, No. 333, Alt. 2600 m.

Khillanmarg.

Rosa webbiana Wall. FBI. 2:366.

A prickly shrub with pinkish-white colored flowers.

Yarikhah, T. A. Rao, Nos. 112, 179, 29, Alt. 2400 m.

Gulmarg.

Pyrus baccata L. FBI. 2:373.

A small tree with pinkish green fruits (not in flowers).

Pahalgam, T. A. Rao, No. 534, Alt. 2500 m.

Lidder valley.

Crataegus monogyna Jacq.

Syn. *Crataegus oxyacantha* L. FBI. 2:303.

Local name: RING.

A small spinescent tree with red fruits (not in flowers).

Shankaracharya hill top, T. A. Rao, No. 779 Alt. 2060 m.

Cotoneaster nummularia F. & M.

Local name: SUNOO.

A small evergreen shrub with red fruits. Used for basket making.
Shankaracharya hill top, T. A. Rao, No. 786, Alt. 2060 m.

Saxitragaceae*Saxifraga flagellaris* Willd. FBI. 2:397.

A small pubescent erect herb with golden yellow flowers.
Kolohai glacial valley, T. A. Rao, No. 715, Alt. 3830 m.

Bergenia ligulata (Wall.) Engl.Syn. *Saxifraga ligulata* Wall. FBI. 2:398.

A thick rhizomatic herb with big fleshy leaves growing in crevices of rocks. With fruits only.
Drang forest, T. A. Rao, No. 385, Alt. 3000 m.
Gulmarg.

Saxifraga sibirica Linn. FBI. 2:390.

A small pubescent erect herb with white flowers.
Kolohai glacial valley, T. A. Rao, No. 717, Alt. 3960 m.

Saxifraga stracheyi Hk.f. & T. FBI. 2:398.

A thick rhizomatic herb obovate leaves, white or pale yellow flowers.
Apharwat, T. A. Rao, No. 474, Alt. 4100 m.
Lidderwat.

Parnassia ovata Ledeb. FBI. 2:403.

An erect herb with white flowers.
Sonamarg glacial valley, T. A. Rao, No. 807, Alt. 3333 m.

Ribes orientale Poir. FBI. 2:410.

Local name: KHAGDAAKH.
A small shrub with small greenish flowers.
Ferozepur Nalah, T. A. Rao, No. 368, Alt. 2700 m.
Drang forest.

Crassulaceae*Sedum asiaticum* DC. FBI. 2:419.

A stout erect or sub-erect herb with white or pale yellow flowers. Found in damp places
Kolohai glacial valley, T. A. Rao, No. 718, Alt. 3967 m.

Sedum ewersii Ledeb. FBI. 2:421.

A small stout herb with fleshy leaves and pinkish white or rose-purple flowers.
Lidderwat, T. A. Rao, Nos. 814, 643, Alt. 3333 m.
Thajwas glacial valley.

Sedum quadrifidum Pall. FBI. 2:418.

A stout erect herb with pinkish or red flowers.
Apharwat, T. A. Rao, No. 468, Alt. 4100 m.

***Sedum oreades* Hamet.**

A small tender herb with yellow flowers, near damp places.
Lidderwat hill tops, T. A. Rao, No. 701, Alt. 3200 m.

***Sedum rosulatum* Edgew. FBI. 2:420.**

A small herb with thin leaves and small white flowers.
In rocky crevices.
Drang forest, T. A. Rao, No. 377, Alt. 2600 m.

***Sedum tibeticum* H.f. & T. FBI. 2:418.**

A small herb with fruits near rocky boulders.
Apharwat, T. A. Rao, No. 467.

Hamamelidaceae***Parrotia jacquemontiana* Decne. FBI. 2:426.**

Local name: PASER, HATAB.
A small tree 6 to 14 ft. high with fruits (not in flowers).
Best for fuel.
Drang, T. A. Rao, Nos. 426, 390, Alt. 2500 m.
Ferozepur nahal, Babarishi & Tangmarg.

Halorrhagidaceae***Myriophyllum spicatum* L. FBI. 2:433.**

A submerged aquatic herb with aerial terminal spikes.
Dal, T. A. Rao, Nos. 756, 824, Alt. 2000 m.
Nagin Manasbal and Wular Lakes.

***Myriophyllum verticillatum* Linn., FBI. 2:433.**

A submerged herb with capillary leaves and with spikes having pinkish white flowers
Dal, T. A. Rao, No. 760, Alt. 1900 m.
Nagin, Manasbal & Wular Lakes.

Lythraceae***Rotala densiflora* (Roth.) Koehne.**

Syn. *Ammannia pentandra* Roxb. FBI. 2:568.
A semi-aquatic herb with axillary red flowers in paddy fields.
Harwan reserve forest, T. A. Rao, No. 837, Alt. 2100 m.

***Lythrum salicaria* L.**

A tall herb with pink flowers near paddy fields.
Harwan reserve forest, T. A. Rao, No. 844, Alt. 2100 m.

Onagraceae***Epilobium angustifolium* L. FBI. 2:582.**

A tall herb with pinkish white flowers.
Kolohai glacial valley, T. A. Rao, No. 727, Alt. 3500 m.

***Epilobium cylindricum* D. Don. FBI. 2:585.**

An erect herb with small red or purplish flowers.

Ferozepur nahal, T. A. Rao, Nos. 330, 549, Alt. 2600 m.

Pahalgam, Lidder valley & Sindh valley.

***Epilobium hirsutum* L. FBI. 2:583.**

An erect herb with small red or purplish flowers.

Babarishi, T. A. Rao, Nos. 418, 734, Alt. 2500 m.

Pahalgam.

***Chamaenerion latifolium* (L.) Sweet.**

Syn. *Epilobium latifolium* L. FBI. 2:583.

A herb nearly a foot in length with rose-purple or pale pinkish flowers. Found on moraine.

Kolohai glacial valley, T. A. Rao, No. 714, Alt. 4000 m.

***Epilobium origanifolium* Lamk. FBI. 2:586.**

An erect herb with greyish fruits (not in flowers).

Lidderwat, T. A. Rao, No. 651, Alt. 3200 m.

***Epilobium roseum* Schreb. FBI. 2:584.**

An erect hairy herb with pale pink flowers.

Lidderwat and hill tops, T. A. Rao, Nos. 637, 638, Alt. 3200 m.

***Circaea alpina* L. FBI. 2:589.**

An erect herb with small white flowers near damp places.

Sonamarg glacial valley, T. A. Rao, Nos. 816, 514, 152, 387, 580, Alt. 3333 m.

Baisaran, Pahalgam & Ferozepur nahal.

***Trapa natans* Linn. FBI. 2:590.**

Local name: GAJAR.

An aquatic floating herb with white flowers. Fruits edible.

Dal, T. A. Rao, No. 758, Alt. 1900 m.

Nagin Manasbal & Wular Lakes.

***Oenothera drummondii* Hk.**

A stout erect herb with yellow flowers. Cultivated.

Yarikhah, T. A. Rao, No. 100, Alt. 2400 m.

Tangmarg.

Umbelliferae

***Eryngium billardieri* Delar. FBI. 2:670.**

An erect herb with small white flowers in heads.

Bracts spine-like.

Shankaracharya hill top, T. A. Rao, No. 784, Alt. 2300 m.

Vicatia conifolia DC. FBI. 2:671.

A small stunted herb with small white flowers.

Babarishi, T. A. Rao, Nos. 419, 563, 117, 61, 244. Alt. 2100 m.

Aru, Tangmarg, Gulmarg, Khillanmarg, Apherwat, & Lidderwat.

Bupleurum longicaule Wall. FBI. 2:677.

An erect herb with small yellow flowers.

Yarikhah, T. A. Rao, Nos. 144, 159, Alt. 2500 m.

Tangmarg & Gulmarg.

Bupleurum candollei Wall. FBI. 2:674.

Local name: NARI.

A tall erect perennial herb with small yellow flowers.

Drang, T. A. Rao, No. 389, Alt. 2670 m.

Pahalgam.

Bupleurum falcatum Linn. FBI. 2:676.

An erect tall herb with small yellow flowered umbels.

Pahalgam, T. A. Rao, Nos. 542,, 782, Alt. 2500 m.

Shankaracharya hill.

Bupleurum tenue Don. FBI. 2:677.

A tall erect much branched herb with compound umbels of small yellow flowers.

Niglalinalah, T. A. Rao, No. 436, Alt. 2300 m.

Yarikhah.

Carum carui Linn. FBI. 2:680.

Local name: ZIRA.

A much branched diffuse herb with small white flowers.

Yarikhah, T. A. Rao, No. 5, Alt. 2400 m.

Tangmarg & Gulmarg.

Sium latijugum C.B.C. FBI. 2:683.

An erect aromatic herb with small white flowers.

Near running water.

Yarikhah. T. A. Rao, Nos. 89, 20, 129, Alt. 2400 m.

Tangmarg, Gulmarg.

Chaerophyllum acuminatum Lindl. FBI. 2:691.

An erect herb with small white flowers.

Khillanmarg, T. A. Rao, No. 450, Alt. 3500 m.

Apherwat.

Chaerophyllum villosum Wall. FBI. 2:691.

Local name: MUKHACH.

An erect much branched herb with white flowers in compound umbels. Leaves edible.

Aru, T. A. Rao, No. 558, Alt. 2700 m.

Chandanwari.

Angelica glauca Edgew. FBI. 2:706.

A tall stout herb with compound umbels of white flowers.

Lidder valley, T. A. Rao, No. 520, Alt. 2500 m.

Sindh valley & Gulmarg.

Ferula jaeschkeana Vatke. FBI. 2:708.

Local name: A'PAT KANPHUR.

An erect branching herb with corymbose inflorescences bearing large reddish fruits. Used for oil and as fodder in winter.

Ferozepur nahal, T. A. Rao, No. 374, Alt. 2700 m.

Drang

Heracleus candicans Wall. FBI. 2:714.

Local name: KENDAL.

A stout herb with white flowers in umbels. Used as fodder for sheep, goats, etc.

Kolohai glacial valley, T. A. Rao, No. 728, Alt. 3800 m.

Archangelica himalaica Clarke.

Syn. *Archangelica officinalis* Hoff. FBI. 2:707.

Local name: VANVAG.

A stout tall herb with small white flowers in umbels.

Fetioles used in confectionery.

Gulmarg, T. A. Rao, No. 173, Alt. 2900 m.

Tangmarg.

Caucalis latifolia L. FBI. 2:719.

A small hispid herb in fruits only.

Tangmarg, T. A. Rao, No. 424, Alt. 2600 m.

Babarishi.

Araliaceae

Aralia cachemirica DC. FBI. 2:722.

Local name: KHOREE.

A vigorously growing shrub with small white flowers in umbels.

Yarikhah, T. A. Rao, No. 169, Alt. 2930 m.

Gulmarg.

Hederu nepalensis K. Koch.

Local name: HARBANBAL.

A climbing plant with red fruits in umbels.

Drang, T. A. Rao, No. 395, Alt. 2800 m.

Gulmarg, Pahalgam & Baisaran.

Caprifoliaceae***Sambucus ebulus* L. FBI. 3:2.**

A gregarious tall herb with white flowers in corymbs.

Yarikhah, T. A. Rao, No. 164, Alt. 2600 m

Gulmarg, Pahalgam, Lidderwat & Thajwas glacial valley.

***Viburnum nervosum* Don. FBI. 3:8.**

A stunted much branched shrub with red fruits (not in flowers).

Yarikhah, T. A. Rao, No. 85, Alt. 2400 m.

Gulmarg, Pahalgam, Aru, Lidder valley, Sindh valley & Drang.

***Lonicera orientalis* Lamk. FBI. 3:15.**

A tree 15 to 20 ft. with white flowers and red fruits.

Gulmarg, T. A. Rao, No. 254, Alt. 3160 m.

Khillanmarg.

***Lonicera quinquelocularis* Hardw. FBI. 3:14.**

Local name: BAKDU, PHUT, PAKHAR, MAKARKAT.

Tree, 10 to 15 ft. high with axillary clustered small white flowers.

Gulmarg, T. A. Rao, No. 300, Alt. 3430 m.

Khillanmarg.

***Lonicera purpurascens* H.f. & T. FBI. 3:12.**

A small bushy tree with globose black fruits.

Gulmarg, T. A. Rao, No. 285, Alt. 3500 m.

Khillanmarg.

Rubiaceae***Rubia cordifolia* L. FBI. 3:202.**

A weak climbing branched herb with small flowers and globose fruits. Medicinal.

Srinagar, T. A. Rao, No. nil, Alt. 2500 m.

Tangmarg, Ferozepore nahal, Drang, Baisaran & Pahalgam.

***Galium aparine* L. FBI. 3:205.**

A tender climbing herb with hooked fruits only.

Pahalgam, T. A. Rao, No. 556, Alt. 2600 m.

***Galium asperuloides* Edgew.**

Syn. *Galium triflorum* Michx. FBI. 3:205.

A straggling herb with small white flowers.

Gulmarg, T. A. Rao, Nos. 232, Alt. 3000 m.

Khillanmarg, Pahalgam & Baisaran.

***Galium verum* L. FBI. 3:208.**

A tender climbing herb with yellow flowers and hairy fruits.

Gulmarg golf field, T. A. Rao, Nos. 228, 118, 26, Alt. 3100 m.

Yarikhah & Pahalgam.

Valerianaceae***Valeriana dioica* Linn. FBI. 3:211.**

A small erect or semi erect herb with white flowered corymbs.

Apharwat, T. A. Rao, No. 491, Alt. 4400 m.

Khillanmarg.

***Valeriana hardwickii* Wall. FBI. 3:213.**

A tall herb with small white flowers. Medicinal.

Drang, T. A. Rao, Nos. 711, 301, 264, Alt. 3830 m.

Kolohai glacial valley, Gulmarg & Khillanmarg.

***Valeriana hardwickii* var. *acuminata* Royle. FBI. 3:213.**

A tall herb hairy at nodes with small white flowers.

Drang forest, T. A. Rao, No. 380, Alt. 2600 m.

***Valeriana officinalis* L. FBI. 3:211.**

An erect or sub-erect herb with small whitish pink flowers.

In damp places and in crevices. Medicinal.

Lidderwat, T. A. Rao, No. 712, Alt. 3830 m.

Kolohai glacial valley.

***Valeriana stracheyii* C.B.C. FBI. 3:212.**

An erect herb with white flowers in corymbs.

Ninglinalah area, T. A. Rao, No. 430, Alt. 2300 m.

***Valeriana jatamansi* Jones.**

Syn. *Valeriana wallichii* DC. FBI. 3:213.

A tender decumbent rhizomatic herb with small white flowers in corymbs. **Rootstocks are collected for their scent and exported. Medicinal.**

Lidderwat, T. A. Rao, Nos. 704, 240, Alt. 3200 m.

Khillanmarg & Gulmarg.

Dipsacaceae***Morina longifolia* Wall. FBI. 3:216.**

Local name: KANDCHHEN, KANDIARA.

A tall erect aromatic herb. spiny and with pale pink flowers.

Lidderwat hill top, T. A. Rao, No. 663.

***Dipsacus inermis* Wall. FBI. 3:217.**

Local name: UPPALHAK.

A tall vigorous herb with pale yellow flowers in heads.

Near damp places.

Chandanwari, T. A. Rao, No. 516, Alt. 3500 m.

Lidder valley.

Dipsacus strictus Don. FBI. 3:217.

A tall herb with pale yellow heads.

Chandanwari, T. A. Rao, No. 633, Alt. 3500 m.

Lidder valley.

Dipsacus atratus Hf. & T. FBI. 3:218.

A tall herb with pinnatifid leaves.

Babul canal area, T. A. Rao, No. 341, Alt. 2000 m.

Compositae

Solidago virga-aurea L. FBI. 3:245.

A tall herb with yellow inflorescences.

Ninglinalah, T. A. Rao, No. 434, Alt. 2300 m.

Pahalgam & Tangmarg.

Aster thomsoni Cl. FBI. 3:252.

An erect herb with whitish pink heads.

Lidderwat, T. A. Rao, No. 702, Alt. 3500 m.

On the way to Kolohai glacial valley.

Erigeron alpinus L. FBI. 3:255.

An erect herb with white or slightly bluish heads.

Pahalgam, T. A. Rao, Nos. 523, 537, Alt. 2500 m.

Lidder valley.

Conyza canadensis (L.) Cronquist.

Syn. *Erigeron canadensis* L. FBI. 3:254.

A herb with small white heads.

Pahalgam, T. A. Rao, No. 528, Alt. 2500 m.

Lidder valley.

Filago germanica L. FBI. 3:277.

A small erect woolly herb with yellow heads.

Drang, T. A. Rao, No. 347, Alt. 2600 m.

Ferozepur nahal, Tangmarg & Gulmarg.

Leontopodium alpinum Cass. FBI. 3:279.

An erect woolly herb with purple heads.

Apharwat, T. A. Rao, No. 498, Alt. 3700 m.

Anaphalis cuneifolia Hk.f. FBI. 3:280.

A woolly herb with white heads.

Gulmarg, T. A. Rao, Nos. 460, 282, 298, Alt. 3400 m.

Khillanmarg & Apharwat.

Anaphalis nubigena DC. FBI. 3:279.

An erect herb with white heads.

Lidderwat hill tops, T. A. Rao, No. 677, Alt. 3500 m.

Gnaphalium luteo-album L. FBI. 3:288.

An erect woolly herb with golden yellow heads.

Babarishi, T. A. Rao, Nos. 417, 463, Alt. 2500 m.

Khillanmarg & Agharwat.

Inula racemosa Hk.f. FBI. 3:292.

Local name: POSHKAR.

A stout herb with many heads.

Tangmarg, T. A. Rao, No. 45, Alt. 2400 m.

Gulmarg.

Inula royleana DC. FBI. 3:292.

Local name: GULABTAB.

A stout large-leaved herb with yellow heads (in buds).

Lidderwat hill tops, T. A. Rao, Nos. 684, 292, Alt. 3700 m.

Gulmarg & Khillanmarg.

Pulicaria vulgaris Gaertn. FBI. 3:298.

A small erect herb with yellow heads.

Ninglinalah, T. A. Rao, No. 446, Alt. 2400 m.

Gulmarg.

Carpesium cernuum L. FBI. 3:300.

An erect herb with yellow heads.

Ferozepur nahal T. A. Rao, No. 327, Alt. 2500 m.

Drang & Tangmarg.

Galinsoga parviflora Cav. FBI. 3:311.

A weak herb with white heads.

Tangmarg, T. A. Rao, No. 356, Alt. 2600 m.

Drang & Ferozepur nahal.

Achillea millefolium L. FBI. 3: 312.

Local name: AKARKARA.

An erect stoloniferous herb with purple heads.

Yarikhah, T. A. Rao, Nos. 8, 529, Alt. 2400 m.

Tangmarg, Gulmarg, Pahalgam, Aru & Chandanwari.

Allardia tomentosa Decne. FBI. 3:313.

A small woolly herb with white ligulate flowers and black or purple disk florets.

Kolohai glacial valley, T. A. Rao, No. 710, Alt. 3800 m.

Chrysanthemum leucanthemum Linn.

An erect introduced herb with ligulate white flowers and yellow disc florets near damp places.
Yarikhah, T. A. Rao, No. 50, Alt. 2400 m.
Gulmarg.

Tanacetum longifolium Wall. FBI. 3:320.

Local name: AKARKARA.
A tall erect herb with yellow heads found near boulders.
Gulmarg, T. A. Rao, Nos. 296, 707, Alt. 3100 m.
Khillanmarg & Kolohai glacial valley.

Artemisia campbellii H. f. & T. FBI. 3:327.

An erect aromatic stout herb with flowers in racemes.
Lidderwat hill tops, T. A. Rao, No. 664, Alt. 3500 m.

Artemisia glauca, Pall. FBI. 3:322.

A pubescent herb with flowers in racemes.
Kokernag stream banks, T. A. Rao, No. 749, Alt. 2300 m.

Artemisia moorcroftiana Wall. FBI. 3:327.

A tall aromatic herb with the inflorescence, elongated spikes or racemes
Kokernag stream banks, T. A. Rao, No. 749, Alt. 2300 m.

Artemisia parviflora Roxb. FBI. 3:322.

Shrubby inodorous herb with small greenish flowers and seeds.
Chandanwari, T. A. Rao, No. 613, Alt. 2400 m.

Artemisia roxburghiana Besser. FBI. 3:326.

A herb with creeping root stock and pinnatifid leaves.
Khillanmarg, T. A. Rao, No. 276, Alt. 3200 m.

Artemisia sacrorum Ledeb. FBI. 3:326.

An erect shrubby herb with flowers in racemes.
Drang forests, T. A. Rao, No. 369, Alt. 2600 m.

Artemisia scoparia W. & K. FBI. 3:323.

A slender branched annual with minute fruits.
Drang, T. A. Rao, No. 349, Alt. 2600 m.

Artemisia vestita Wall. FBI. 3:326.

An erect aromatic herb with finely divided leaves.
Shankaracharya hill top, T. A. Rao, No. 770, Alt. 2000 m.

Artemisia vulgaris L. FBI. 3:325.

Local name: TETHWAN.
A tall aromatic shrub-like herb in thickets with flowers in racemes.

***Doronicum roylei* DC. FBI. 3:332.**

A tall erect herb with achenes in heads (not in flowers)
Gulmarg golf field, T. A. Rao, No. 215, Alt. 3000 m.

***Senecio chrysanthemoides* DC FBI. 3:339.**

A tall robust herb with golden yellow heads.
Lidderwat, T. A. Rao, Nos. 647, 225, 843 663, Alt. 3500 m.
Gulmarg golf field & Harwan reserve forest.

***Senecio chrysanthemoides* var. *analogus* Hk.f. FBI. 3:339.**

An erect herb with small leaves and yellow heads.
Gulmarg, T. A. Rao, No. 71, Alt. 2400 m.
Yarikhah.

***Calendula officinalis* Linn. FBI. 3:358.**

An erect herb with orange yellow flowers.
Gulmarg golf field, T. A. Rao, No. 235, Alt. 3000 m.

***Arctium lappa* Linn. FBI. 3:359.**

Local name: CHERON, PHAGGARMUL.
A tall herb with purple heads. Medicinal.
Drang forest, T. A. Rao, Nos. 397, 506, Alt. 2500 m.
Pahalgam.

***Carduus nutans* L. FBI. 3:361.**

Local name: KHON DARD, KAHAND.
A tall erect thistle with purple or pinkish heads.
Yarikhah, T. A. Rao, Nos. 172, 518, Alt. 2300 m.
Gulmarg, Pahalgam, Lidder valley, Sindh valley & Srinagar.

***Cnicus argyranthus* DC. FBI. 3:362.**

A stiff slender spinescent herb with pinkish heads.
Yarikhah, T. A. Rao, No. 67, Alt. 2400 m.
Gulmarg.

***Cnicus falconeri* H.f. FBI. 3:363.**

Local name: JAANCH.
A tall vigorously growing stout herb with large globose woolly heads (in buds).
Lidderwat, T. A. Rao, No. 661, Alt. 3160 m.
Lidder valley & Sindh valley.

***Centaurea calcitrapa* Linn. FBI. 3:385.**

A rigid erect herb with long spreading spiny bracts and pinkish red or purple heads.
Yarikhah, T. A. Rao, No. 185, Alt. 2900 m
Gulmarg.

Centaurea iberica Stev. FBI. 3:385.

A rigid erect herb with pale purple heads.
Srinagar, T. A. Rao, No. Nil, Alt. 2500 m.
Shankaracharya hill.

Cichorium intybus L. FBI. 3:391.

Local name: KASHNI.
An erect herb with blue and white flowers.
Yarikhah, T. A. Rao, Nos. 3, 23, Alt. 2400 m.
Gulmarg, Pahalgam, Aru, Chaudanwari, Drang & Ferozpur nalah.

Lapsana communis L. FBI. 3:392.

A tall erect herb with yellow heads.
Yarikhah, T. A. Rao, No. 178, Alt. 2900 m.
Gulmarg.

Picris hieracioides L. FBI. 3:393.

Local name: BRAHAND.
A rigid erect herb with yellow heads.
Yarikhah, T. A. Rao, No. 47, Alt. 2400 m.
Gulmarg.

Crepis flexuosa (DC.) B. & AK. FBI. 3:394.

A tall herb with blue heads.
Pahalgam, T. A. Rao, No. 502, Alt. 2600 m.
Lidder valley.

Pterotheca falconerii Hk.f. FBI. 3:399.

A tall herb with yellow heads
Pahalgam, T. A. Rao, No. 531, Alt. 2600 m
Lidder valley.

Hieracium vulgatum Koch. FBI. 3:399.

A tall erect plant with yellow heads.
Gulmarg, T. A. Rao, No. 256, Alt. 3100 m.
Khillanmarg.

Taraxacum officinale Wigg. FBI. 3:401.

Local name: HAND.
A scapigerous milky herb with radical leaves and yellow or pale yellow heads. Medicinal.
Yarikhah, T. A. Rao, Nos. 24, 202, Alt. 2400 m.
Pahalgam & Koishai glacial valley.

Taraxacum wattii Hook. FBI. 3:402.

A tall milky herb with pale yellow heads.
Aru, T. A. Rao, No. 572, Alt. 2660 m.

Lactuca dissecta Don. FBI. 3:405.

An erect herb with yellow florets.

Yarikhah, T. A. Rao, Nos. 121, 122, Alt. 2400 m.
Gulmarg.

Lactuca longifolia DC. FBI. 3:405.

A tall erect herb with small blue heads.

Drang, T. A. Rao, Nos. 399, 555, Alt. 2630 m.
Ferozepur nahal, Aru, Tangmarg & Gulmarg

Lactuca scariola L. FBI. 3:404.

A tall erect herb with whitish green heads

Yarikhah. T. A. Rao, No. 200, Alt. 2400 m.

Tragopogon pratense L. FBI. 3:418.

A tall erect herb with grass-like leaves and mucronated achenes.

Srinagar T. A. Rao, Nos. 98, 788, Alt. 2200 m.

Campanulaceae

Codonopsis ovata Benth. FBI. 3:433.

A slender herb erect or sub-erect with pale blue or sky-blue flowers near damp places

Lidderwat hill tops, T. A. Rao, No. 699, Alt. 3600 m.

Codonopsis rotundifolia Benth. FBI. 3:432.

A weak climber with purple or grey-blue bell-shaped flowers.

Ferozepur nahal, T. A. Rao, No. 352, Alt. 3600 m.

Drang, Pahalgam & Aru.

Campanumaea javanica Blume. FBI. 3:435.

A weak twiner with pink or purple bell-shaped flowers.

Drang T. A. Rao, No. 312, Alt. 2400 m.

Ferozepur nahal.

Campanula latifolia L. FBI. 3:439.

Local name: BRANZ, HAKH, KASH.

A tall erect herb with purple flowers.

Ferozepur nahal, T. A. Rao Nos. 306, 736, Alt. 2300 m

Campanula ramulosa Wall. FBI. 3:440.

A Small erect or sub-erect herb with purple or dark pink flowers.
Ferozepur Naiah, T. A. Rao, Nos. 615, 307, Alt. 3100 m.
Drang, Pahalgam, Lidder valley, Chandanwari & Aru.

Ericaceae

Gaultheria trichophylla Royle. FBI. 3:457.

A small wiry herb with bell-shaped red flowers.
Apharwat, T. A. Rao, No. 476, Alt. 4100 m.

Cassiope fastigiata Don. FBI. 3:459.

A stout fastigiata shrub with bell-shaped flowers, white in colour.
Apharwat, T. A. Rao, No. 475, Alt. 4100 m.

Rhododendron campanulatum Don. FBI. 3:466.

A large shrub with tomentose leaves and with fruits (not in flowers).
Apharwat, T. A. Rao, No. 469, Alt. 4300 m.

Rhododendron hypenanthum Balf.

Syn. *Rhododendron anthopogon* D. Don. FBI. 3:472.
A small shrub with small leaves and pale yellow flowers.
Apharwat, T. A. Rao, No. 465, Alt. 4100 m.

Monotropaceae

Monotropa uniflora Linn. FBI. 3:476.

A parasitic yellow leafless herb with solitary flowers.
Gulmarg, T. A. Rao, No. 268, Alt. 3200 m.
Khillanmarg.

Hypopithys lanuginosa Nutt. FBI. 3:476.

A parasitic leafless herb with yellow flowers in racemes.
Yarikhah, T. A. Rao, Nos. 82, 577, Alt. 2400 m.
Pahalgam.

Primulaceae

Primula elliptica Royle. FBI. 3:488.

A sub-erect tufty herb with purple or pinkish white flowers.
Apharwat, T. A. Rao, No. 461, Alt. 4100 m.

Primula erosa Wall. FBI. 3:486.

A sub-erect tufty herb with fruits (not in flowers).
Gulmarg, T. A. Rao, No. 270, Alt. 3100 m.
Khillanmarg.

Primula involucrata Wall. FBI. 3:488.

A tufty herb with petioled radical leaves and white flowers
Khillanmarg, T. A. Rao, Nos. 260, 480, Alt. 3200 m.
Apharwat.

Primula macrophylla D. Don. FBI. 3:490.

A vigorously growing herb near running water with pale violet or purple coloured flowers.
Apharwat, T. A. Rao, Nos. 462, 723, Alt. 4000 m.
Kolohai glacial valley.

Primula pulchra Watt. FBI. 3:483.

A slender herb with purple flowers. A new record for Kashmir flora.
Apharwat, T. A. Rao, No. 464, Alt. 4300 m.

Androsace rotundifolia Hardw. FBI. 3:496.

A perennial herb with flowers having green calyx, white corolla with yellow throat.
Yarikhah, T. A. Rao, Nos. 97, 34, 403, Alt. 2400 m.
Gulmarg, Drang & Pahalgam.

Androsace sarmentosa Wall. FBI. 3:498.

A running herb in patches having pale rose or pale red flowers.
Gulmarg, T. A. Rao, No. 277, Alt. 3100 m.
Khillanmarg & Kolohai glacial valley.

Androsace sempervivoides Jacquem. FBI. 3:497.

A small stoloniferous herb with rosulate leaves having ciliate margins.
Apharwat, T. A. Rao, No. 483, Alt. 4100 m.

Cortusa matthioli Linn. FBI. 3:501.

A shady herb with pale pink or purple flowers.
Apharwat, T. A. Rao, No. 486, Alt. 3500—4500 m.

Anagallis arvensis Linn. FBI. 3:506.

A semi-erect or procumbent herb with vermilion coloured small flowers.
Yarikhah, T. A. Rao, Nos. 425, 636, 315, 73, 834, Alt. 2600 m.
Drang, Ferozepur nalah, Babarishi, Pahalgam. Lidderwat, Chandanwari, Srinagar & Harwan.
forest.

Oleaceae

Jasminum grandiflorum Linn. FBI. 3:603.

A much branched weak shrub with white flowers.
Ferozepur nalah, T. A. Rao, No. 329, Alt. 2600 m.
Drang.

Jasminum humile Linn. FBI. 3:602.

A small shrub with yellow flowers in cymes.
Kokernag Stream bank, T. A. Rao, No. 747, Alt. 2300 m.

Syringa emodi Wall. FBI. 3:605.

A tall shrub (almost a small tree) with white flowers in panicles.
Gulmarg, T. A. Rao, Nos. 252, 495, 286, Alt. 3100 m.
Apharwat & Khillanmarg.

Asclepiadaceae

Cynanchum glaucum Wall. FBI. 4:22.

A yellow flowered tall erect herb in damp places.

Yarikhah, T. A. Rao, Nos. 63, 131, Alt. 2400 m.

Gulmarg.

Loganiaceae

Buddleia lindleyana Fort.

A small shrub with blue flowers in panicles

Introduced ornamental.

Srinagar, T. A. Rao, No. 822, Alt. 2100 m.

Gentianaceae

Eracum tetragonum Roxb. FBI. 4:95.

An ornamental branching herb with pale pink or azure blue flowers.

Pahalgam, T. A. Rao, No. 576, Alt. 2600 m.

Gentiana carinata Griseb. FBI. 4:113.

A small erect herb with blue flowers.

Apharwat, T. A. Rao, Nos. 481, 213, Alt. 4100 m.

Gulmarg golf field.

Gentiana delonsea Fries. var. *stracheyii*. FBI. 4:118.

An erect tall herb with pale pink flowers.

Thajwas glacial valley, T. A. Rao, No. 804, Alt. 333.

Gentiana tenella Fries. FBI. 4:109.

A blue or pale purple flowered small herb on alpine slopes.

Yarikhah, T. A. Rao, Nos. 80, 808, Alt. 2400 m.

Thajwas.

Swertia angustifolia Ham. FBI. 4:125.

A tall erect herb with white or pale blue flowers.

Lidderwat hill tops, T. A. Rao, No. 669, Alt. 3500 m.

Swertia cordata Wall. FBI. 4:123.

A tall erect herb with buds.

Pahalgam, T. A. Rao, No. 544, Alt. 2500 m.

Lidder valley.

Swertia perfoliata Royle. (?).

An erect herb. Not in flowers.

Thajwas glacial valley, T. A. Rao, No. 809, Alt. 3333 m.

Swertia petiolata Royle. FBI. 4:128.

A tall erect herb near running water with grey or white flowers.

Yarikhah, T. A. Rao, Nos. 47, 723, 705, 471, Alt. 3400 m.

Apharwat & Kolohai glacial valley.

A BOTANICAL TOUR IN KASHMIR STATE

Swertia sp.

An erect herb with small white flowers.

Lidderwat, T. A. Rao, No. 655, Alt. 3200 m.

Pleurogyne carinthiaca Griseb. FBI. 4:120.

A small erect tender herb with deep blue flowers.

Thajwas glacial valley, T. A. Rao, No. 802, Alt. 3333 m

Limnanthemum nymphaeoides Link. FBI. 4:131.

An aquatic floating herb with yellow flowers in umbels.

Dal, T. A. Rao, Nos. 828, 750, Alt. 2100 m.

Nagin and Wular lakes.

Polemoniaceae

Polemonium coeruleum Linn. FBI. 4:133.

A tall erect herb with blue flowers.

Lidderwat, T. A. Rao, Nos. 672, 176, 229, Alt. 3500 m.

Gulmarg & Khillanmarg.

Boraginaceae

Cynoglossum lanceolatum Forsk.

Syn. *Cynoglossum micranthum* Desf. FBI. 4:156.

A tall erect hairy herb with small white flowers.

Shankaracharya hill top, T. A. Rao, No. 798, Alt. 2300 m.

Cynoglossum wallichii Don. FBI. 4:157.

An erect hairy herb with pale blue flowers.

Yarikhah, T. A. Rao, No. 22, Alt. 2400 m.

Gulmarg.

Lindelofia spectabilis Lehm. FBI. 4:159.

A densely hairy herb with deep blue flowers.

Lidderwat hill top, T. A. Rao, Nos. 687, 267, Alt. 3600 m.

Gulmarg & Khillanmarg.

Paracaryum thomsonii C.B.C. FBI. 4:161.

A tall erect herb with big blue flowers and yellow scales near the throat.

Gulmarg, T. A. Rao, Nos. 236, 657, Alt. 3100 m.

Khillanmarg & Lidderwat hill top.

Echinosperrnum barbatum Lehm. FBI. 4:163.

An erect hairy herb with pale sky-blue flowers and yellow scales near the throat.
Yarikhah, T. A. Rao, Nos. 233, 157, 654, 599, 509, Alt. 3000 m.
Gulmarg, Baisaran, Khillanmarg, Pahalgam & Lidderwat.

Eritrichium strictum Decne. FBI. 4:164.

A small erect herb with deep blue flowers.
Khillanmarg, T. A. Rao, No. 455, Alt. 3500 m.
Apharwat.

Eritrichium tibeticum C.B.C. FBI. 4:165.

A small erect herb with sky-blue flowers.
Lidderwat hill tops, T. A. Rao, No. 653, Alt. 3160 m.

Lycopsis arvensis Linn. FBI. 4:168.

An erect small herb with small white flowers.
Yarikhah, T. A. Rao, Nos. 608, 115, 423, Alt. 3100 m.
Gulmarg, Babarishi & Chandanwari.

Mertensia elongata Benth. FBI. 4:170.

A small herb with many flowered racemes.
Yarikhah, T. A. Rao, No. 87, Alt. 2400 m.
Drang.

Myosotis laxa Schum.

An erect tender herb with sky-blue flowers.
Yarikhah, T. A. Rao, Nos. 18, 41, Alt. 2400 m
Ferozepur nahah.

Myosotis sylvatica Hoff. FBI. 4:173.

A semi-erect herb with small white flowers.
Achabal, T. A. Rao, No. 743, Alt. 2300 m

Convolvulaceae*Convolvulus arvensis* Linn. FBI. 4:219.

A tender climber with big bell-shaped purple flowers.
Yarikhah, T. A. Rao, Nos. 116, 552, 32, 96, Alt. 2400 m.
Aru, Ferozepur nahah, Drang & Srinagar.

Cuscuta approximata Babc.

A slender climber with filiform stem and white flowers in clusters parasitizing
serpyllum.
Very rare.
Shankaracharya hill top, T. A. Rao, No. 781, Alt. 2300 m.

Cuscuta capitata Roxb. FBI. 4:227.

A slender yellow climber with white flowers and parasitizing *Stachys sericea*.
Ferozepur nahal, T. A. Rao, No. 339, Alt. 2600 m.
Pahalgam & Aru.

Solanaceae

Solanum nigrum Linn. FBI. 4:229.

A suffruticose herb with white flowers.
Chandanwari, T. A. Rao, Nos. 626, 848, 444, Alt. 2730 m.
Srinagar-Harwan Reserve Forest, Yarikhah & Ninglinalah.

Solanum tuberosum Linn.

A cultivated plant.
Ferozepur nahal, T. A. Rao, Nos. 358, 622, Alt. 2600 m.
Aru.

Datura stramonium Linn. FBI. 4:242.

A tall erect herb with white flowers.
Chandanwari, T. A. Rao, No. 630, Alt. 2700 m.
Manasbal area.

Hyoscyamus niger Linn. FBI. 4:244.

Local name: BAAJAR BHANG.
A hairy erect herb with purple flowers.
Yarikhah, T. A. Rao, No. 174, Alt. 3100 m.
Gulmarg, Pahalgam & Lidderwat.

Scrophulariaceae

Verbascum thapsus Linn. FBI. 4:250.

A stout erect woolly herb with yellow flowers in spikes.
Gulmarg, T. A. Rao, No. 170, Alt. 3000 m.
Khillanmarg, Pahalgam, Aru & Lidderwat.

Linaria dalmatica (L.) Miller.

An erect or semi-erect herb with yellow flowers.
Introduced from Europe.
Shankaracharya hill top, T. A. Rao, No. 769, Alt. 2100 m.

Scrophularia lucida Linn. FBI. 4:256.

A tender herb with tan coloured flowers near damp places.
Ferozepur nahal, T. A. Rao, Nos. 372, 439, Alt. 2800 m.
Drang & Yarikhah.

Scrophularia polyantha Royle. FBI. 4:255.

A stout herb with green flowers in thyrsoid panicles.
Gulmarg golf field, T. A. Rao, Nos. 634, 221, 438, Alt. 2700 m.
Ninglinalah, Pahalgam & Chandanwari.

Mazus japonicus (Thunb.) Ktze.

Syn. *Mazus rugosus* Lour. FBI. 4:259.

A small erect herb with white flowers.

Aru, T. A. Rao, Nos. 568, 137, Alt. 3000 m.

Yarikhah & Srinagar.

Picrorhiza kurroa Royle. FBI. 4:290.

A hairy herb with small white or blue flowers in spikes.

Lidderwat, T. A. Rao, No. 646, Alt. 3200 m.

Kolohai glacial valley.

Veronica anagallis Linn. FBI. 4:293.

A prostrate herb with blue or white flowers, near damp places.

Aru, T. A. Rao No. 570, Alt. 2600 m.

Pahalgam.

Veronica agrestis Linn. FBI. 4:294.

An erect succulent herb with small white flowers.

Kheerbhavani springs, T. A. Rao, No. 831, Alt. 2100 m.

Veronica beccabunga Linn. FBI. 4:293.

A decumbent succulent aquatic herb with deep blue flowers.

Pahalgam, T. A. Rao, Nos. 510, 648, Alt. 2660 m.

Lidderwat.

Veronica ciliata Fisch. FBI. 4:292.

A tall semi-erect herb with small pale blue flowers.

Lidderwat hill top, T. A. Rao, No. 700, Alt. 3600 m.

Lidder valley.

Veronica melissaefolia Poir.

Syn. *Veronica laxa* Benth. FBI. 4:295.

A hairy herb with blue flowers.

Gulmarg golf field, T. A. Rao, Nos. 217, 656, Alt. 3000 m.

Lidderwat.

Veronica persica Poir. FBI. 4:294.

A prostrate or semi-erect aquatic herb with flowers in buds.

Yarikhah, T. A. Rao, No. 203, Alt. 3200 m.

Gulmarg golf field.

Veronica serpyllifolia Linn. FBI. 4:296.

A prostrate tender herb with small blue flowers.

Yarikhah, T. A. Rao, No. 224, Alt. 3200 m.

Gulmarg golf field.

***Leptorhabdos benthamiana* Walp. FBI. 4:303.**

A tall erect plant with small white flowers in racemes.
Shankaracharya hill top, T. A. Rao, Nos. 785, 739, Alt. 2400 m.
Pahalgam & Lidder valley.

***Euphrasia officinalis* Linn. FBI. 4:305.**

A small wiry herb with pale purple or white flowers.
Yarikhah, T. A. Rao, Nos. 416, 497, 145, 522, Alt. 3000 m.
Gulmarg, Babarishi, Pahalgam, Aphaawat & Khillanmarg.

***Pedicularis bicornuta* Koltz. FBI. 4:312.**

A stout herb with yellow flowers near running water.
Gulmarg golf field, T. A. Rao, Nos. 271, 721, 685, 720, Alt. 3000—4000 m.
Kolohai glacial valley & Lidderwat hill tops.

***Pedicularis pectinata* Wall. FBI. 4:306.**

A stout erect herb with pink flowers near running water.
Ferozepur nahah, T. A. Rao, Nos. 314, 69, 679, 697, Alt. 2300—3000 m.
Yarikhah & Lidderwat hill top.

***Pedicularis pyramidata* Royle. FBI. 4:306.**

An erect herb with pink flowers forming a dense spike.
Lidderwat, T. A. Rao, No. 645, Alt. 3400 m.
Kolohai glacial valley.

***Pedicularis versicolor* Wahlenb. FBI. 4:316.**

A herb with short stem and orange yellow flowers.
Aphaawat, T. A. Rao, No. 494, Alt. 4000 m.
Lidderwat hill top.

***Digitalis lanata* Ehrh.**

A cultivated erect herb. Medicinal.
Yarikhah, T. A. Rao, Nos. 6, 575, Alt. 2400 m.
Pahalgam.

***Digitalis purpurea* Linn.**

Cultivated. Medicinal.
Yarikhah Drug Research Institute, T. A. Rao, Nos. 92, 93, 94, Alt. 2200 m.

Orobanchaceae***Orobanche epithimum* DC. FBI. 4:325.**

A thick yellow tuberous stem with pale pink flowers.
Pahalgam, T. A. Rao, Nos. 543, 667, Alt. 3200 m.
Lidderwat hill top.

Acanthaceae

Strobilanthes alatus Nees. FBI. 4:464.

A tall shrubby herb with dark pink flowers.

Chandanwari, T. A. Rao, No. 635, Alt. 2700 m

Pahalgam.

Strobilanthes atropurpureus Nees. FBI. 4:472.

An erect shrubby herb near damp places with white or purple coloured flowers.

Ferozepur nahal, T. A. Rao, Nos. 308, 353, Alt. 2300 m.

Drang.

Strobilanthes glutinosus Nees. FBI. 4:458.

A tall shrubby herb with hairy small greenish flowers.

Baisaran, T. A. Rao, Nos. 598, 342, Alt. 2900 m.

Ferozepur nahal.

Verbenaceae

Verbena officinalis Linn. FBI. 4:565.

An erect herb with small pink flowers in spikes.

Achabal, T. A. Rao, Nos. 744, 413, Alt. 2300 m.

Babarishi.

Labiatae

Plectranthus rugosus Wall. FBI. 4:620.

Local name: PUMAR.

An erect shrubby aromatic herb with white flowers in cymes.

Shankaracharya hill, T. A. Rao, No. 775, Alt. 2100 m.

Elsholtzia eriostachya Benth. FBI. 4:645.

An aromatic erect herb with spikes bearing ash coloured small flowers

Sonamarg, T. A. Rao, No. 813, Alt. 3333 m.

Mentha arvensis Linn. FBI. 4:648.

A tall hairy aromatic herb with flowers, small, white and scented.

Ferozepur nahal, T. A. Rao, No. 337, Alt. 2600 m.

Drang.

Mentha sylvestris Linn. FBI. 4:647.

A robust hairy aromatic herb with pale pinkish flowers.

Kokernag stream, T. A. Rao, No. 746, Alt. 2300 m.

Origanum vulgare Linn. FBI. 4:648.

Local name: SATRA.

An erect or sub-erect stoloniferous aromatic herb with white or pink flowers.

Pahalgam, T. A. Rao, Nos. 521, 618, 370, 344, 729, Alt. 2600 m.

Chandanwari, Drang, Ferozepur nahal & Kolohai glacial valley.

Thymus serpyllum Linn. FBI. 4:649.

A prostrate or semi-erect aromatic herb with pale pink flowers.

Yarikhah, T. A. Rao, Nos. 141, 220, 513, 670, 709, Alt. 2500 m.

Gulmarg golf field, Pahalgam, Lidderwat hill tops, & Kolohai glacial valley.

Calamintha clinopodium Benth. FBI. 4:650.

Local name: JUNGLI PUDINA.

An aromatic herb with pale pink flowers.

Yarikhah, T. A. Rao, Nos. 30, 569, 158, Alt. 2400 m.

Pahalgam, Aru & Gulmarg.

Salvia glutinosa Linn. FBI. 4:653.

A tall erect herb with pale yellow flowers in crevices.

Ninglinalah, T. A. Rao, Nos. 431, 432, Alt. 2300 m.

Ferozepur nahal & Drang.

Salvia hians Royle. FBI. 4:653.

A tall robust herb with blue or violet flowers.

Gulmarg, T. A. Rao, No. 280, Alt. 3100 m.

Khillanmarg.

Salvia moorcroftiana Wall. FBI. 4:654.

A robust herb with big radical leaves and pale purple or rose colored flowers in spikes.

Shankaracharya hill top, T. A. Rao No. 797, Alt. 2300 m.

Nepeta erecta Benth. FBI. 4:663.

An aromatic tall herb with pale purple flowered spikes.

Tangmarg, T. A. Rao, Nos. 351, 658, Alt. 2600 m.

Drang & Lidderwat hill top.

Nepeta govaniana Benth. FBI. 4:663.

A tall vigorous aromatic herb with pale yellow flowers in racemes.

Baisaran, T. A. Rao, No. 594, Alt. 2900 m.

Pahalgam.

Nepeta salvifolia Royle. FBI. 4:664.

An aromatic much branched herb with pale purple flowers in racemes.

Shankaracharya hill, T. A. Rao, No. 800, Alt. 2100 m.

Prunella vulgaris Linn. FBI. 4:670.

Local name: KALVEDU.

An erect herb with deep purple or violet flowers in spikes.

Yarikhah, T. A. Rao, No. 31, Alt. 2400 m.

Gulmarg, Apharwat, Kolohai glacial valley & Lidderwat.

***Marrubium vulgare* Linn. FBI. 4:671.**

A tall robust herb with pale white flowers in whorls.

Shankaracharya hill top, T. A. Rao, No. 783, Alt. 2300 m.

***Stachys sericea* Wall. FBI. 4:675.**

An erect herb with deep purple or pale pink flowers in spikes.

Ferozepur nahal, T. A. Rao, Nos. 693, 776, 39, Alt. 3630 m.

Drang, Shankaracharya hill & Yarikhah.

***Leonurus cardiaca* Linn. var. *royleana* FBI. 4:678.**

A tall stout herb with bluish white flowers in whorls.

Ferozepur nahal, T. A. Rao, No. 393, Alt. 2800 m.

Drang.

***Lamium album* Linn. FBI. 4:679.**

A prostrate or semi-erect stoloniferous herb with white flowers.

Gulmarg, T. A. Rao, Nos. 357, 231, Alt. 2600 m.

Khillanmarg, Ferozepur nahal & Drang.

***Phlomis bracteosa* Royle. FBI. 4:693.**

A much branched tall stout herb with blue flowers in whorl.

Gulmarg golf field, T. A. Rao, Nos. 223, 478, 536, 730, 683, Alt. 3100 m.

Apharwat, Pahalgam, Kolohai glacial valley & Lidderwat.

***Ajuga bracteosa* Wall. FBI. 4:702.**

A small prostrate herb with white flowers (or pale blue) having prominent bracts.

Ferozepur nahal, T. A. Rao, Nos. 326, 761, 108, Alt. 2600 m.

Dal Lake area & Yarikhah.

Plantaginaceae

***Plantago himalaica* Pilger.**

Syn. *Plantago brachyphylla* Edgew. FBI. 4:706.

A scapigerous herb with cylindrical spikes.

Gulmarg golf field, T. A. Rao, Nos. 212, 454, Alt. 3000 m.

Khillanmarg & Apharwat.

***Plantago lanceolata* Linn. FBI. 4:706.**

A scapigerous herb with pale white flowers in short spikes.

Yarikhah, T. A. Rao, Nos. 36, 107, Alt. 2400 m.

Gulmarg.

***Plantago major* Linn. FBI. 4:705.**

A hairy scapigerous herb with long spikes.

Yarikhah, T. A. Rao, No. 7, Alt. 2400 m.

Gulmarg.

Illecebraceae

Herniaria hirsuta Linn. FBI. 4:712.

A prostrate herb with minute pale green flowers in axillary clusters
Shankaracharya hill, T. A. Rao, Nos. 795, 340, 141, Alt. 2300 m.

Amaranthaceae

Amaranthus blitum L. FBI. 4:721.

An erect herb with clustered flowers in spikes.
Pahalgam, T. A. Rao, No. 507, Alt. 2600 m.
Aru.

Amaranthus hybridus L. Sub. sp. *cruentus* Thell. var. *paniculatus* Thell.

Syn. *Amaranthus paniculatus* Linn. FBI. 4:718.
A tall robust herb with white spikes in dense thyrses.
Ferozepur nahal, T. A. Rao, No. 348, Alt. 2600 m.
Drang & Babul canal area.

Chenopodiaceae

Chenopodium album Linn. FBI. 5:3.

An erect tender herb with flowers in paniced spikes.
Lidder valley, T. A. Rao, No. 550, Alt. 2500 m.
Pahalgam.

Chenopodium foliosum (Moench) Aschers.

Syn. *Chenopodium blitum* Hk.f. FBI. 5:5.
An erect tall herb with flowers in clusters at the nodes bearing red fruits at maturity.
Yarikhah, T. A. Rao, Nos. 183, 184, 175, 106, Alt. 2900 m.
Gulmarg & Ferozepur nahal.

Chenopodium botrys Linn. FBI. 5:4.

An erect aromatic herb with clustered greenish flowers in racemes.
Chandanwari, T. A. Rao, Nos. 606, 313, 799, Alt. 2700 m.
Drang, Ferozepur nahal & Shankaracharya hill top.

Chenopodium hybridum Linn. FBI. 5:3.

- An erect herb with white panicles of flowers.
Chandanwari, T. A. Rao, No. 620, Alt. 2700 m.
Pahalgam.

Chenopodium murale Linn. FBI. 5:4.

An erect or semi-erect herb with flowers in spikes.
Yarikhah, T. A. Rao, No. 199, Alt. 2400 m.
Gulmarg.

Phytolaccaceae

Phytolacca lathenia (Buch.-Ham) Walt.

Syn. *Phytolacca acinosa* Hk. f. non Roxb. FBI. 5:21.

Local name: MITHAKAFAL.

A stout tall herb with greenish flowers in racemes on a stout rachis.

The roots are used to adulterate belladonna.

Yarikhah, T. A. Rao, Nos. 163, 578, Alt. 2900 m.

Gulmarg & Baisaran.

Polygonaceae

Polygonum affine D. Don. FBI. 5:33.

A small erect herb with pale or deep rose flowers.

Gulmarg, T. A. Rao, No. 297, Alt. 3500 m.

Khillanmarg & Lidderwat.

Polygonum alatum Ham. FBI. 5:41.

An erect or semi-erect herb with white or pale pink flowers near damp places.

Ferozepur Nalah, T. A. Rao, Nos. 639, 583, 310, Alt. 3200 m.

Gaisaran, Drang & Lidderwat.

Polygonum alpinum All. FBI. 5:49.

A tall branching shrub with small white flowers in terminal panicles.

Varikhah, T. A. Rao, Nos. 105, 336, Alt. 2400 m.

Ferozepur Nalah, Pahalgam, Drang & Lidderwat.

Polygonum amplexicaule D. Don. FBI. 5:32.

Local name: MASLOON, ANJBAR.

An erect or obliquely disposed herb with deep red or pale red flowers.

Ferozepur Nalah, T. A. Rao, No. 335, Alt. 2600 m.

Drang, Pahalgam & Sindh valley.

Polygonum aviculare Linn. FBI. 5:26.

A prostrate herb with small white flowers near damp places.

Yarikhah, T. A. Rao, Nos. 77, 153, Alt. 2400 m.

Ferozepur Nalah, Gulmarg & Pahaigam.

Polygonum convolvulus Linn. FBI. 5:53.

Local name: THRUMBA.

A semi-erect herb with small white flowers in axillary clusters. Used in bread making.

Lidder valley.

Polygonum dumetorum Linn. FBI. 5:54.

A tender twiner climbing on hedges with greenish fruits which are inversely egg-shaped.

Pahalgam, T. A. Rao, No. 731, Alt. 2500 m.

Lidder valley.

Polygonum hydropiper Linn. FBI. 5:39.

A tall erect herb with pale pink flowers near damp places.
Yarikhah, T. A. Rao, Nos. 149, 311, Alt. 2600 m.
Drang & Ferozpur nahal.

Polygonum persicaria Linn. FBI. 5:35.

An erect tender herb with white flowers in racemes.
Sonamarg glacial valley, T. A. Rao, No. Nil, Alt. 4000 m.

Polygonum tubulosum Boiss. FBI. 5:27.

A small spreading herb with rosy flowers near rocks.
Ferozpur nahal, T. A. Rao, No. 343, Alt. 2600 m.
Drang & Lidder valley.

Polygonum viviparum Linn. FBI. 5:31.

An erect tender herb with white flowers in spikes.
Sonamarg glacial valley, T. A. Rao, No. 803, Alt. 3000 m.

Oxyria digyna Hill. FBI. 5:58.

An erect fleshy herb with pale white or green flowers in racemes.
Lidderwat hill top, T. A. Rao, No. 694, Alt. 3600 m.
Kolohai glacial valley.

Rumex acetosella Linn. FBI. 5:61.

A tall erect herb with small white or rose flowers in racemes on long axis.
Lidderwat hill top, T. A. Rao, Nos. 695, 527, 294, Alt. 3600 m.
Pahalgam, Lidder valley, Gulmarg & Khillanmarg.

Rumex hastatus Don. FBI. 5:60.

A much branched slender herb with pale pink or rosy flowers.
Shankaracharya hill top, T. A. Rao, No. 773, Alt. 2100 m.

Rumex nepalensis Spreng. FBI. 5:60.

A tall branching herb with flowers in whorls or elongated racemose clusters.
Gulmarg, T. A. Rao, Nos. 262, 182, Alt. 3100 m.
Khillanmarg, Yarikhah, Lidder valley, Pahalgam, Lidderwat & Kolohai glacial valley.

Lauraceae

Cassytha filiformis Linn. FBI. 5:188.

A slender twiner on *Viburnum nervosum* and *Indigofera gerardiana*, with white flowers (in buds).
Pahalgam, T. A. Rao, Nos. 571, 627, Alt. 2600 m.
Aru & Chandanwari.

Thymelaeaceae

Daphne oleoides Schreb. FBI. 5:193.

A much branched small shrub with white flowers.

Shankaracharya hill top, T. A. Rao, No. 771, Alt. 2100 m.

Loranthaceae

Viscum album Linn. FBI. 5:223.

A small bushy parasite growing on *Juglans regia*. Not in flowers.

Ferozepur nahal, T. A. Rao, No. 401, Alt. 2600 m.

Euphorbiaceae

Euphorbia hispida Boiss.

Syn. *Euphorbia emodi* Hk.f. FBI. 5:250.

A prostrate herb with small white flowers.

Chandanwari, T. A. Rao, Nos. 607, 787, Alt. 2800 m.

Shankaracharya hill.

Euphorbia maddenii Boiss. FBI. 5:288.

A small tender branching herb with small pale green flowers.

Shankaracharya hill top, T. A. Rao, No. 793, Alt. 2300 m.

Euphorbia pilosa Linn. FBI. 5:260.

A tall erect herb with yellow flowers.

Pahalgam, T. A. Rao, Nos. 538, 671, Alt. 2600 m.

Lidderwat hill top.

Euphorbia wallichii Hk.f. FBI. 5:258.

A vigorously growing shrubby herb with yellow flowers.

Khillanmarg, T. A. Rao, Nos. 452, 265, Alt. 3500 m.

Apharwat & Gulmarg.

Urticaceae

Celtis australis Linn. FBI. 5:482.

Local name: BRUMBJII.

A small bushy tree with fruits only.

Ferozepur nahal, T. A. Rao, No. 361, Alt. 2600 m.

Drang.

Cannabis sativa Linn. FBI. 5:487.

Cultivated. A tall herb with pale green flowers.

Pahalgam, T. A. Rao, Nos. 603, 362, Alt. 2800 m.

Ferozepur nahal.

Urtica parviflora Roxb. FBI. 5:548.

A tall stout herb with stinging hairs and flowers in panicles.

Yarikhah, T. A. Rao, No. 84, Alt. 2400 m.

Srinagar, Lidder valley & Sindh valley.

Platanaceae

Platanus orientalis Linn. FBI. 5:594.

A large tree with flowers in heads.

The plane tree (CHINAR). Various uses.

Srinagar, T. A. Rao, No. 820, Alt. 2000 m.

Sonamarg.

Juglandaceae

Juglans regia Linn. FBI. 5:595.

A large deciduous tree cultivated for Walnuts.

Yarikhah, T. A. Rao, No. 10, Alt. 2400 m.

Srinagar valley.

Cupuliferae

Betula utilis Don. FBI. 5:599.

Local name: BOJAPATRA.

A big tree with characteristic peeling of white bark.

Khillanmarg, T. A. Rao, No. 295, Alt. 3500 m.

Apharwat, Lidderwat hill top & Kolohai glacial hills.

Quercus griffithii, Hk.f. & T. FBI. 5:602.

A small deciduous tree with fruits only. Introduced.

Srinagar Harwan Reserve Forest, T. A. Rao, No. 842.

Salicaceae

Salix acmophylla Boiss. FBI. 5:628.

A tall tree with catkins. Witches Broom Common.

Ferozepur nalah, T. A. Rao, No. 331, Alt. 2600 m.

Drang & Yarikhah.

Salix elegans Wall. FBI. 5:630.

A small tree with white flowers in catkins.

Gulmarg, T. A. Rao, Nos. 273, 441, Alt. 3200 m

Khillanmarg & Ninglinalah.

Salix viminalis Linn. FBI. 5:631.

A tall tree with fruits on open grassy lands.

Yarikhah, T. A. Rao, No. 64, Alt. 2400 m.

Srinagar valley.

Populus ciliata Wall. FBI. 5:638.

A tall tree with capsules on a long stipe. Used for fuel.

Baisaran, T. A. Rao, No. 597, Alt. 2800 m.

Pahalgam.

Ceratophyllaceae

Ceratophyllum demersum Linn. FBI. 5:639.

An aquatic herb with capillary leaves.

Dal and Nagin Lakes, T. A. Rao, No. 752, Alt. 1900 m.

Coniferae

Cupressus torulosa Don. 5:645.

A small tree exhibiting sessile green cones. Cultivated

Srinagar, T. A. Rao, No. 780, Alt. 2300 m.

Shankaracharya hill.

Juniperus recurva Ham. FBI. 5:647.

An erect bush or stunted tree with fastigate branches.

Apharwat, T. A. Rao, Nos. 472, 291, Alt. 4300 m.

Khillanmarg, Gulmarg & Kolohai glacial hill top.

Taxus baccata Linn. FBI. 5:648.

A small tree with spreading branches with cones.

Babarishi, T. A. Rao, No. 421, Alt. 2600 m.

Yarikhah.

Pinus wallichiana A. B. Jackson.

Syn. *Pinus excelsa* Wall. FBI. 5:651

Local name: KAIL, BIAR.

With mature cones.

Yarikhah, T. A. Rao, No. 146, Alt. 2900 m.

Gulmarg, Khillanmarg, Pahalgam, Lidderwat & Baisaran.

Cedrus deodara (Roxb.) Loudon.

Syn. *Cedrus libani* Barrel, var *deodara*. FBI. 5:653.

Gulmarg, T. A. Rao, No. 442, Alt. 2500 m.

Ninglinalah, Babarishi & Yarikhah.

Picea smithiana Boiss.

Syn. *Picea morinda* Link. FBI. 5:653.

Local name: KACHHLU, RAI, TOS.

A tree with whorled branches and bearing axillary male and terminal female cones.

Yarikhah, T. A. Rao, Nos. 57, 147, 151, 414, 167, Alt. 2900 m.

Gulmarg, Pahalgam & Aru.

Abies pindrow (Royle.) Spach.Syn. *Abies webbiana* Lindl. var *pindrow* Brandis. FBI. 5:855.

Local name: TUNG, PALUDAR.

A lofty tree with slender and cylindrical black cones.

Yarikhah, T. A. Rao, No. 166.

Gulmarg & Pahalgam.

Orchidaceae*Neottia listeroides* Lindl. FBI. 6:103.

An erect pale green herb with greenish flowers having dark labellum.

Baisaran, T. A. Rao, Nos. 579, 589, Alt. 3000 m.

Pahalgam.

Goodyera repens R. Br. FBI. 6:111.

A small leafy herb with white flowers in spikes

Baisaran T. A. Rao, No. 588, Alt. 2900 m.

Pahalgam.

Epipactis royleana Lindl. FBI. 6:126.

An erect leafy herb with pale white flowers in racemes.

Pahalgam, T. A. Rao, Nos. 586, 501, 165, 443, Alt. 2800 m.

Baisaran, Gulmarg, Ninglinalah & Babarishi.

Orchis latifolia Linn. FBI. 6:127.

An erect leafy herb with violet colored flowers in spikes.

Gulmarg, T. A. Rao, Nos. 289, 258, Alt. 3500 m.

Khillanmarg & Baisaran.

Iridaceae*Iris kumaonensis* Wall. FBI. 6:274.

Local name: KRISHAM.

An erect herb with linear leaves and purple flowers in spathes.

Lidderwat hill top, T. A. Rao, Nos. 698, 722, Alt. 3700 m.

Kolohai glacial valley.

Iris hookeriana Foster. FBI. 6:275.

An erect herb with linear leaves and small trigonous beaked capsules

Gulmarg, T. A. Rao, No. 287, Alt. 3500 m.

Dioscoreaceae*Dioscorea deltoidea* Wall. FBI. 6:291.

A climber with slender branches and slender male spikes and female plant with deltoid capsules.

Ferozepur nahal, T. A. Rao, Nos. 402, 355, Alt. 2100 m.

Liliaceae*Asparagus adscendens* Roxb. FBI. 6:317.

A flexuous excessively branched shrub (not in flowers).

Ferozepore nahal, T. A. Rao, No. 349, Alt. 2600 m.

Asparagus filicinus Ham. FBI. 6:314.

A flexuous much branched climber with black berries.

Drang, T. A. Rao, No. 376, Alt. 2700 m.

Ferozepur nahal.

Polygonatum verticillatum All. FBI. 6:321.

A tall erect herb with leaves in whorls bearing many seeded fruits.

Ferozepur nahah, T. A. Rao, No. 398, Alt. 2700 m.

Crang

Allium blandum Wall. FBI. 6:339.

A tall erect herb with pink flowers.

Sonamarg glacial valley, T. A. Rao, No. 806, Alt. 4500 m.

Allium govanianum Wall. FBI. 6:344.

A small herb with white stellate flowers.

Khillanmarg, T. A. Rao, No. 470, Alt. 3700 m.

Apharwat.

Fritillaria roylei Hook. FBI. 6:353.

A tall erect herb with scaly bulbs and yellow green flowers.

Gulmarg T. A. Rao, Nos. 272, 473, Alt. 3100 m.

Khillanmarg & Apharwat.

Trillium govanianum Wall. FBI. 6:361.

An erect rhizomatic herb with red fleshy berries.

Baisaran, T. A. Rao, Nos. 591, 245, Alt. 2900 m

Gulmarg fir forests.

Juncaceae

Juncus glaucus Ehrh. FBI. 6:393.

An erect annual herb with variable cymes near damp places.

Yarikhah, T. A. Rao, No. 42, Alt. 2400 m.

Ferozepur nahah.

Juncus himalensis Kolt. FBI. 6:398.

An erect herb with hollow stem and irregular flowers.

Gulmarg golf field, T. A. Rao, No. 257, Alt. 3100 m.

Juncus membranaceus Royle. FBI. 6:397.

A stoloniferous tufted herb having membranous basal sheaths.

Kolohai glacial valley, T. A. Rao, Nos. 805, 726, Alt. 3300 m

Sonamarg glacial valley.

Luzula campestris DC. FBI. 6:401.

A grass-like perennial herb with cymes of unequal length.

Pahalgam, T. A. Rao, No. 587, Alt. 2700 m.

Balsaran.

Luzula spicata DC. FBI. 6:401.

A tall grass-like perennial herb with solitary cyme.

Gulmarg, T. A. Rao, No. 203, Alt. 3000 m.

Typhaceae

Typha angustata Chaub. & Bory. FBI. 6:489.

Local name: KUNDAR.

A tall marshy herb with dense superposed catkins in the form of an elongated spikes.

Pahalgam, T. A. Rao, No. 737, Alt. 2500 m.

Srinagar, Dal & Nagin Lakes.

Aroideae

Arisaema jacquemontii Bl. FBI. 6:505.

A tuberous herb with striped hood-like spathe.

Gulmarg Fir Forests, T. A. Rao, No. 248, Alt. 3100 m.

Aru, Lidderwat hill tops, Pahalgam, Sindh Valley & Ferozepur nahal.

Arisaema utile Hk.f. FBI. 6:499.

A tuberous herb with a solitary leaf.

Gulmarg, T. A. Rao, No. 252. Alt. 3100 m.

Lemnaceae

Lemna polyrrhiza Linn. FBI. 6:557.

A small aquatic floating plant with spathes.

Dal, T. A. Rao, No. 755, Alt. 1600 m.

Nagin, Wular & Manasbal Lakes.

Alismaceae

Alisma plantago Linn. FBI. 6:559.

A scapigerous herb with pale pink or rosy or white flowers in paniced whorls.

Yarikhah, T. A. Rao, Nos. 128, 72, 19, Alt. 2300 m.

Gulmarg & Pahalgam.

Sagittaria sinensis L.

Syn. *Sagittaria sagittifolia* Linn. FBI. 6:561.

An erect aquatic plant with erect scapes of white flowers in whorls.

Dal. T. A. Rao, Nos. 754, 835, Alt. 1600 m.

Nagin, Wular & Manasbal Lakes.

Butomus umbellatus Linn. FBI. 6:562.

An erect aquatic herb with creeping rootstock and small white flowers in umbels.

Manasbal lake, T. A. Rao, No. 830, Alt. 1600 m.

Naiadaceae

Potamogeton lucens Linn. FBI. 6:567.

A much branched submerged aquatic herb with aerial or submerged spikes.

Dal, T. A. Rao, Nos. 762, 825, Alt. 2600 m.

Nagin, Manasbal & Wular Lakes.

Potamogeton pectinatus Linn. FBI. 6:567.

A branching submerged aquatic herb with filiform leaves. Not in flowers.

Manasbai, T. A. Rao, No. 753, Alt. 2600 m.

Dal, Nagin & Wular Lakes.

Potamogeton zizii Roth.

A much branched submerged aquatic herb with bigger leaves than *P. lucens*. Not in flowers.

Dal, T. A. Rao, Nos. 761, 826, Alt. 2600 m.

Nagin, Manasbal & Wular Lakes.

Najas marina Linn.

Syn. *Najas major* All. FBI. 6:569.

A branched submerged plant with whorled leaves. Not in flowers.

Dal, T. A. Rao, No. 823, Alt. 2100 m.

Nagin, Manasbal & Wular Lakes.

Eriocaulaceae

Eriocaulon sieboldianum Sieb. & Zucc. FBI. 6:577.

An annual aquatic herb with many scapes of small globose dark heads.

Harwan Reserve Forest, T. A. Rao, No. 836, Alt. 2000 m.

Cyperaceae

Cyperus globosus All. FBI. 6:591.

Harwan Reserve Forest, T. A. Rao, No. 833, Alt. 2100 m.

Srinagar.

Cyperus iria Linn. FBI. 6:606.

Harwan Reserve Forest, T. A. Rao, No. 641, Alt. 2100 m.

Shankaracharya hill & Srinagar.

Eleocharis palustris R. Br. FBI. 6:628.

Yarikhah, T. A. Rao, No. 75, Alt. 2400 m.

Nimbristylis dichotoma Vahl. FBI. 6:635.

Harwan Reserve Forest, T. A. Rao, No. 839, Alt. 2100 m.

Srinagar.

Scirpus setaceus Linn.

Lidderwat, T. A. Rao, No. 641, Alt. 3200 m.

Pahalgam.

Carex muricata Linn. FBI. 6:703.

Drang, T. A. Rao, No. 388, Alt. 3000 m.

Ferozepur nalah,

Carex nubigena D. Don. FBI. 6:702.

Gulmarg golf field.

Carex phacota Spreng. FBI. 6:708.

Yarikhah, T. A. Rao, No. 16, Alt. 2400 m.

Gulmarg.

Gramineae

Echinochloa crusgalli (L.) Beauv.

Syn. *Panicum crusgalli* Linn. FBI. 7:30.

Harwan Reserve Forest, T. A. Rao, No. 840, Alt. 2100 m.

Digitaria sanguinalis (L.) Scop.

Syn. *Panicum sanguinale* Linn. FBI. 7:13.

Pahalgam, T. A. Rao, No. 629, Alt. 2700 m.

Lidder valley.

Setaria italica (L.) Beauv. FBI. 7:78.

Chandanwari, T. A. Rao, No. 611, Alt. 2800 m.

Aru & Pahalgam.

Setaria viridis (L.) Beauv. FBI. 7:80.

Chandanwari, T. A. Rao, No. 605, Alt. 2800 m.

Aru & Pahalgam.

Pennisetum flaccidum Griseb. FBI. 7:84.

Chandanwari, T. A. Rao, No. 610, Alt. 2700 m.

Pahalgam.

Pennisetum orientale Rich. FBI. 7:86.

Shankaracharya hill, T. A. Rao, No. 768, Alt. 2100 m.

Srinagar.

Arthraxon serrulatus Hochst.

Syn. *Arthraxon lanceolatus* Hochst. FBI. 7:143.

Shankaracharya hill, T. A. Rao, No. 766, Alt. 2100 m.

Srinagar.

Chrysopogon gryllus (L.) Trin.

Syn. *Andropogon gryllus* Linn. FBI. 7:167.

Pahalgam, T. A. Rao, No. 516, Alt. 2700 m.

Aru & Chandanwari.

Chrysopogon gryllus (L.) Trin. var. *echinulatus* (Hack.) Trin

Yarikhah, T. A. Rao, No. 22. Alt. 2400 m.

Gulmarg.

- Bothriochloa ischaemum* (L.) Keng.
Syn. *Andropogon ischaemum* Linn. FBI. 7:171.
Shankaracharya hill, T. A. Rao, No. 767, Alt. 2100 m.
Srinagar.
- Stipa sibirica* Lamk. FBI 7:231.
Chandanwari, T. A. Rao, No. 601, Alt. 2700 m.
Pahalgam.
- Phleum alpinum* Linn. FBI. 7:236.
Yarikhah, T. A. Rao, No. 130, Alt. 2400 m.
Aru & Chandanwari.
- Agrostis alba* Linn. FBI. 7:254.
Yarikhah, T. A. Rao, No. 130, Alt. 2400 m.
Gulmarg.
- Agrostis nervosa* Nees. ex Trin.
Syn. *Agrostis clarkei* Hk.f. FBI. 7:257.
Pahalgam, T. A. Rao, No. 504, Alt. 2700 m.
Lidder valley.
- Dactylis glomerata* Linn. FBI. 7:335.
Yarikhah, T. A. Rao, Nos. 46, 609, 62, 109, Alt. 2400 m.
Lidderwat & Gulmarg.
- Alopecurus arundinaceus* Poir. FBI. 7:238.
Gulmarg Fir Forest, T. A. Rao, No. 227, Alt. 3000 m.
- Poa annua* Linn. FBI. 7:345.
Yarikhah, T. A. Rao, No. 68, Alt. 2400 m.
Gulmarg.
- Poa pratensis* Linn. FBI. 7:339.
Yarikhah, T. A. Rao, Nos. 177, 226, Alt. 3000 m.
Gulmarg Fir Forests.
- Poa angustifolia* L.
Syn. *Poa pratensis* L. var. *angustifolia* Sm. FBI. 7:340
Yarikhah, T. A. Rao, No. 65, Alt. 2400 m.
Gulmarg.
- Festuca gigantea* Vill. FBI. 7:353.
Yarikhah, T. A. Rao, No. 379, Alt. 2700 m.
Gulmarg, Drang & Ferozepur nahal.
- Festuca polycolea* Stapf. FBI. 7:349.
Yarikhah, T. A. Rao, No. 51, Alt. 2400 m.
Gulmarg.

Bromus macrostachys Desf. FBI. 7:362.

Yarikhah, T. A. Rao, No. 4, Alt. 2400 m.
Gulmarg.

Hordeum vulgure Linn. FBI. 7:371.

Yarikhah, T. A. Rao No. 76, Alt. 2400 m.
Gulmarg.

Pteridophyta-Filicales

Osmunda claytoniana Linn.

Gulmarg Fir Forests, T. A. Rao, No. 249, Alt. 3100 m.
Khillanmarg & Lidderwat.

Adiantum venustum Don.

Yarikhah, T. A. Rao, No. 154, Alt. 2500 m.
Gulmarg, Pahalgam & Aru.

Asplenium adiantum-nigrum Linn.

Yarikhah, T. A. Rao, No. 427, Alt. 2700 m.
Babarishi & Ferozepur nahah.

Ceterach dalhousie (Hk.) C. Chr.

Shankaracharya hill, T. A. Rao, Nos. 772, 789, Alt. 2100 m.
Srinagar.

Athyrium filix femina (L.) Roth.

Syn. *Asplenium filix-femina* Bernh.
Gulmarg Fir Forest, T. A. Rao, Nos. 381, 255, Alt. 2700 m,
Drang Forest.

Athyrium filix femina (L.) Roth. var *attenuata*.

Pahalgam, T. A. Rao, Nos. 659, 660, Alt. 3200 m.
Lidderwat valley.

Diplazium japonicum (Thunb.) Bedd.

Syn. *Asplenium japonicum* Thunb.
Pahalgam, T. A. Rao, No. 658, Alt. 3200 m.
Lidder valley & Aru.

Asplenium septentrionale Hoffm.

Drang Forest, T. A. Rao, Nos. 811, 546, 378, Alt. 3300 m.
Lidderwat, Sonamarg & Pahalgam.

Asplenium trichomanes Linn.

Yarikhah, T. A. Rao, No. 155, Alt. 2500 m.
Gulmarg.

Asplenium viride Huds.

Drang Forest, T. A. Rao, No. 391, Alt. 2700 m.
Gulmarg fir forest.

Asplenium sp.

Pahalgam, T. A. Rao, No. 581, Alt. 2500 m.
Aur & Lidder valley.

Polystichum prescottianum (Wall.) Moore.

Syn. *Aspidium prescottianum* Hook.
Gulmarg Fir Forest, T. A. Rao, Nos. 279, 457, Alt. 3600 m.
Khillanmarg & Apherwat.

Cystopteris fragilis (L.) Bernh.

Lidderwat hill top, T. A. Rao, No. 691, Alt. 3700 m.

Dryopteris barbigera (Moore.) O. Ktze.

Syn. *Nephrodium barbigera* Hk.
Khillanmarg, T. A. Rao, No. 456, Alt. 3600 m.
Apherwat.

Pteridium aquilinum (L.) Kuhn.

Syn. *Pteris aquilina* Linn.
Drang Forest, T. A. Rao, No. 394, Alt. 2400 m.
Gulmarg.

Salvinia natans (L.) All.

Dal and Nagin Lakes, T. A. Rao, No. 751, Alt. 1600 m.

Pteridophyta-Equisetales*Equisetum diffusum* Don.

Yarikhah, T. A. Rao, Nos. 21, 87, 161, Alt. 2500 m.
Gulmarg, Pahalgam & Lidderwat.

Equisetum debile Roxb.

Pahalgam, T. A. Rao, No. 526, Alt. 2500 m.
Lidder valley.

BIBLIOGRAPHY

- Bamber, C. J.* 1916.—Plants of the Punjab.
- Blatter, E.*, 1927-28.—Beautiful flowers of Kashmir, Vols. I and II.
- Cambessedes, J. & Decaisne, F.*, 1845.—Jacquemont. V. Voyage dans l'Inde pendant les années. (1828-32.)
- Collett, H.*, 1902.—Flora Simlensis.
- Coventry, B. O.* 1925-30.—Wild flowers of Kashmir.
- Duthie, J. F.*, 1893. Report on a botanical tour in Kashmir, 1892. Records, B. S. I, I: 1-18.
- Duthie, J. F.*, 1894. Report on a botanical tour in Kashmir, 1893. Records, B.S.I. I:25-47.
- Henderson, G. & Hume, A. O.*, 1873.—Lahore to Yarkand.
- Hooker, J. D.*, 1872-1897.—The Flora of British India.
- Meebold, A.*, 1909.—Eine botanische Reise durch Kashmir. Bot Jahrb 43:63-90.
- Moorcraft, W. & Trebeck, G.*, 1841.—Travels in the Himalayan Provinces of Hindustan.
- Mukerjee, S. K.*, 1940.—A Revision of Labiatae of Indian Empire. Records, B.S.I. 14.1.
- Parker, R. N.*, 1924.—A Forest Flora for the Punjab with Hazara and Delhi, Ed. 2.
- Pennell, F. W.*, 1943.—The Scrophulariaceae of the Western Himalayas,—Monograph. Acad. Sc. Phila, 5.1-VII.
- Royle, J. F.*, 1839.—Illustration of the Botany and other branches of natural history of the Himalayan Mountain and of the flora of Cashmere.
- Stewart, R. R.*, 1916-1917.—Flora of Ladakh. Torrey Bot. Club. 43:571-590; 625-650.
- 1945.—Ferns of Kashmir. Bull. Torrey Bot. Club, 72:399-426.
- 1945.—The Grasses of North West India,—Brittonia. 5 No. 4, 404-468.
- 1951.—Ferns of Pahalgam. J. Indian. Bot. Soc. 30:137-142.
- Vigne, G. T.*, 1842.—Travels in Kashmir and Ladak, Iscardo, the Countries adjoining the mountain course of the Indus and the Himalayas, north of the Punjab.

LIST OF ILLUSTRATIONS

- FIG. 1. Pine Forest near Yarlkhah Tangmarg. Note the absence of dense undergrowth due to shade.
- FIG. 2. Dense Pine Forest on the way to Gulmarg.
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- FIG. 4. Aparwat Mountain at 4,000 m.
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- FIG. 14. Shalimar Garden. Note the majestic Chinar trees.

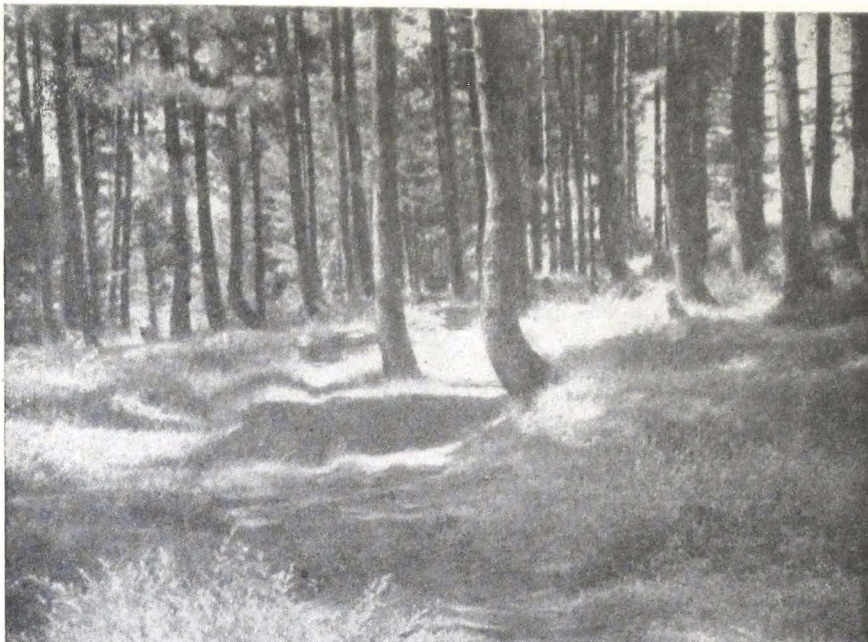


FIG. 1. BLUE PINE FOREST NEAR YARIKHAH TANGMARG. NOTE THE ABSENCE OF DENSE UNDERGROWTH DUE TO SHADE.



FIG. 2. DENSE BLUE PINE FOREST ON THE WAY TO GULMARG.



FIG. 3. *CHRYSANTHEMUM LEUCANTHEMUM* L. ASSOCIATION ON THE SLOPES OF RANI MANDIR (GULMARG).



FIG. 4. APHARWAT MOUNTAIN AT 4,000 M.



FIG. 5. *SAMBUCUS EBULUS* LINN. ASSOCIATION NEAR LIDDERWAT AT 3,334 M.



FIG. 6. *SAMBUCUS EBULUS* LINN. IN FLOWERS NEAR LIDDERWAT AT 3,500 M.



FIG. 7.

CHERRY PLANT IN FRUITS.



FIG. 8. KOLOHAI GLACIAL VALLEY. NOTE THE PRESENCE OF *BETULA* AND *ABIES* ON THE MOUNTAIN SLOPES.



FIG. 9.

KOLOHAI GLACIAL VALLEY.



FIG. 10.

KOLOHAI GLACIER AT 5,000 M.



FIG. 11. *SAMBUCUS EBULUS* LINN. ASSOCIATION AT 4,000 M. IN THE THAJWAS GLACIAL VALLEY

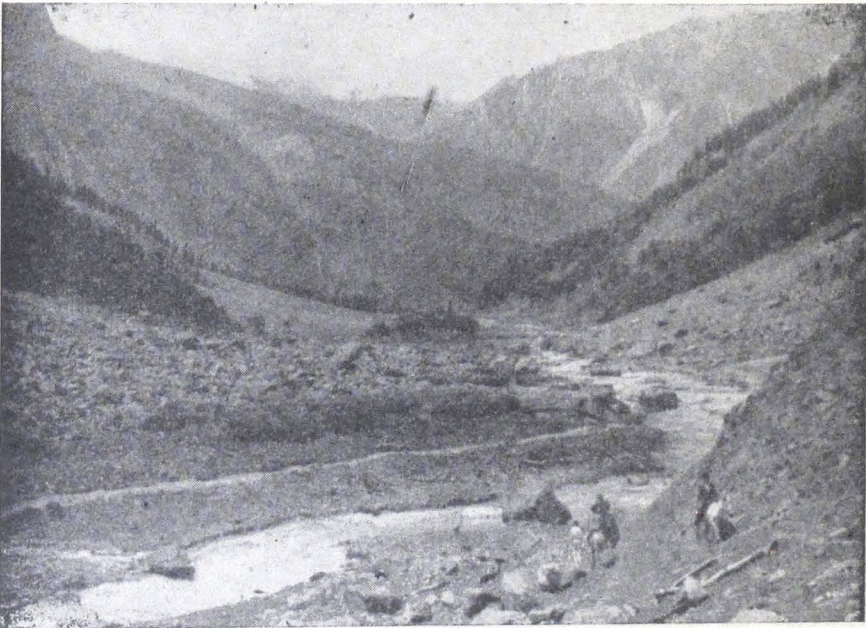


FIG. 12. VIEW OF THAJWAS GLACIAL VALLEY. 3,800 M.



FIG. 13.

AN APPLE TREE IN THE VALE OF SRINAGAR.

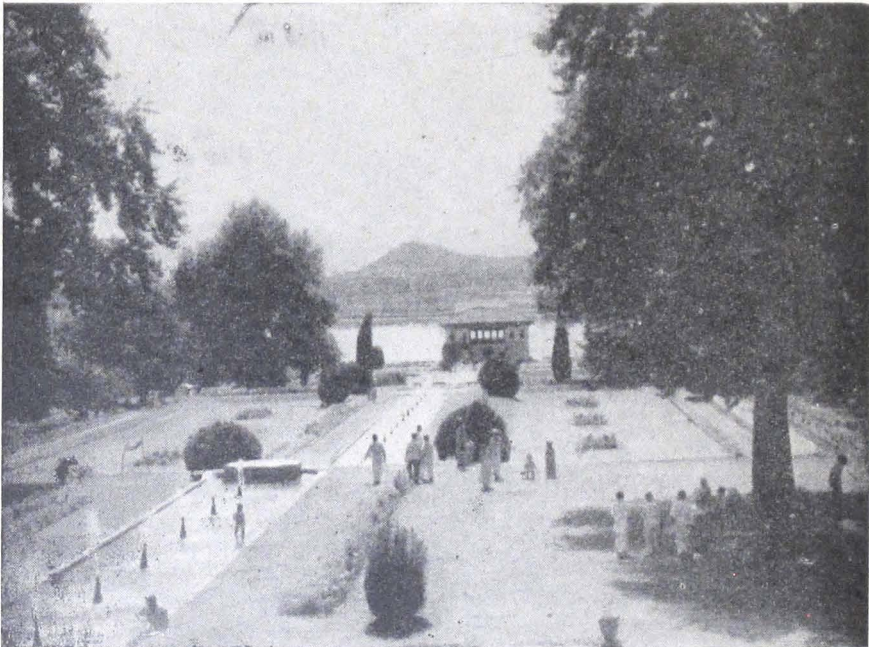
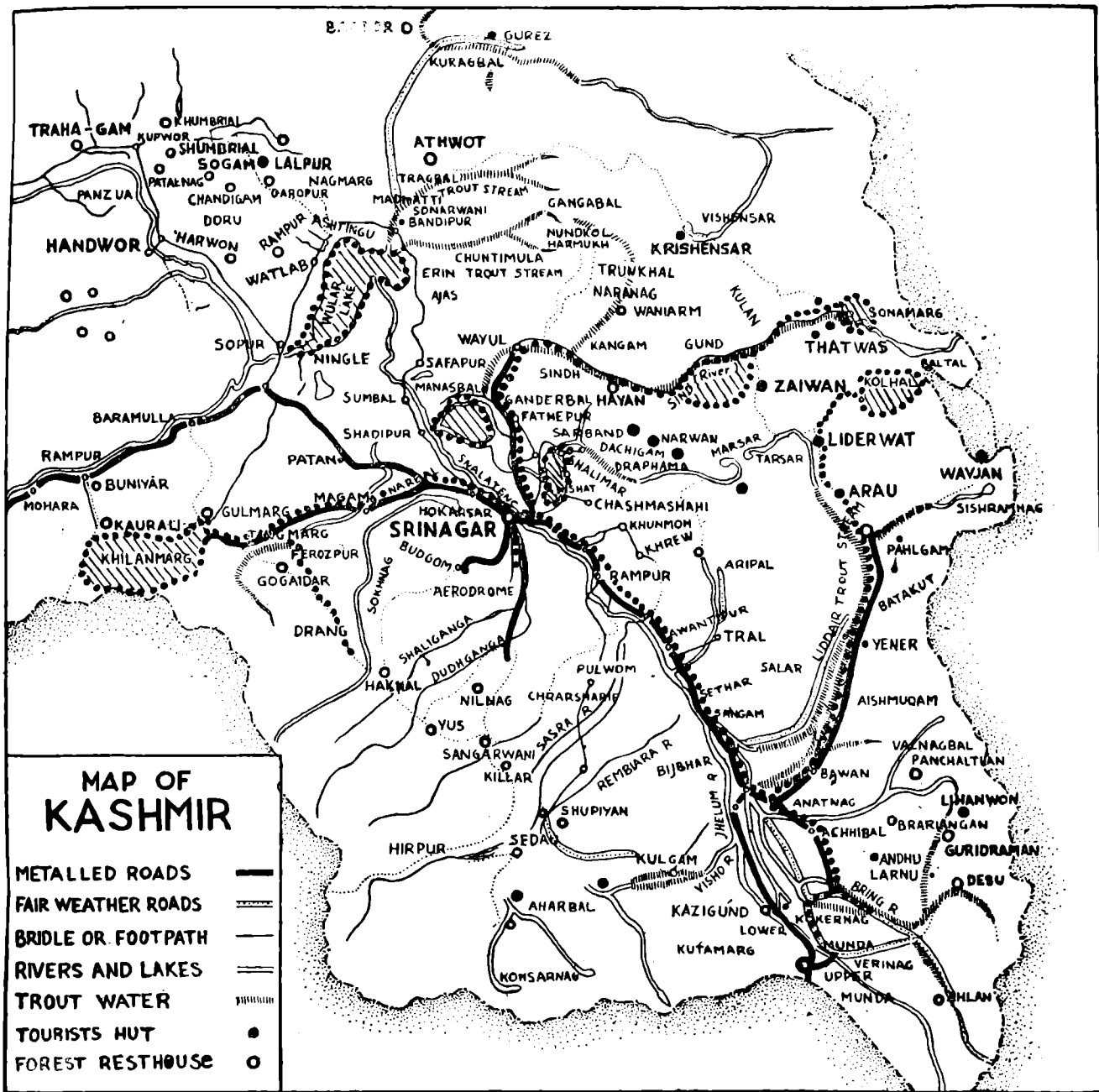


FIG. 14. SHALIMAR GARDEN. NOTE THE MAJESTIC CHINAR TREES.



A. Singh, del.

MAP OF KASHMIR TO ILLUSTRATE THE AREAS VISITED BY THE PARTY DURING THE BOTANICAL EXPLORATION (SHOWN IN DOTS).

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GAUHATI—

Mokshada Pustakalaya.

GAYA—

Sahitya Sadan.

GORAKHPUR (U.P.)—

Blarati Mandir 4, Birapuri.
Halchal Sahitya Mandir (R).
Vishwa Vidyalaya (R), Nukhas Chowk.

GURDUR—

Janatha Agencies (R), Bus Stand, Gurdur Dist.,
Nellore.

GUNTUR—

Bharat Book Centre.

GWALIOR—

M. B. Jain & Brothers.
Saraswati Sadan (Loyal Book Depot).
*Supdt., Ptg. & Sty. (M. B.).
Tatar Bros.

HANAMKONDA—

Deccan Book Stall.

HAZARIBAGH—

Gaya Peshad Khandelwar (R).
Tikak Press (R), P. Box 89, P. O. Giridih.

HOSHARPUR—

Universal Book Stores.

HYDERABAD—

*Director, Govt. Press (Publication Bureau).
Hyderabad Book Depot.
Peoples' Book House, Nizamabad Road.
Swaraj Book Depot, 1308, Lakri-ka-pul.

IMPHAL—

Tikendra & Sons (R), Maxwell Bazar.

INDORE—

Madhya Pradesh Book Centre (R).
National Law House (R).
Rupayana, Rampurwala Buildings, 57, M. G. Road.
Shri Indore Book Depot, 33, Mahatma Gandhi Road.
Swarup Brothers (R), Khajuri Bazar.
Vadhiwa & Co., 56, Mahatma Gandhi Road.

JAGDALPUR—

Sudhakar Bros. (R).

JAIPUR CITY—

Bafuta Book Depot (R).
Dary Book Co., Tripolia Bazar.
*Govt. Ptg. & Sty. Dept., Rajasthan.
Popular Book Depot (R), Choura Bazar.
Rajasthan Pustak Mandir, Tripolia Bazar.
Vani Mandir, Sawal Mansing Highway.

JAMMU—

Krishan General Stores, Raghu Nath Bazar.
Students' Stores, Raghu Nath Bazar.

JAMNAGAR—

Swadeshi Bastu Bhandar.

JAMSHEDPUR—

Amar Kitab Ghar, Diagonal Road, P. B. 18.
Qupta Stores.
Jamshedpur Co-operative College (R).

JODHPUR—

Chopra Brothers, Tripolia Bazar.
Dwarka Dass Nathi.
Kitab Ghar, Sojati Gate.
Mahesh Book House (R).

JUBBULPORE—

Modern Book House, Jawaharganj.
Universal Book Depot (R), Ganjupura.

JULLUNDUR CITY—

Hazooria & Sons, Mal Hiran Gate.
International Book & News Co., G. T. Road (R).
Jain General House.
Kallash Law Publishers (R).
Punjabi Publishers (R), Adda Hoshiarpur Bus Stand
The Punjab Kitab Ghar (R).
University Publishers.

KANPUR—

Advani & Co.
Sahitya Niketan.
Universal Book Stall, The Mall.

KAPASAN—

Nandhar Brothers (R).

KHANDWA—

Abhinav Stores (R), Sivaji Road.
The Suresh Trading Co.

KODARMA—

The Bhagwati Press, P. O. Thumsitelaiya.

KOLAR—

Jai Hind Trading Corpn. (R), Park View.

KOLHAPUR—

Maharashtra Grantha Bhandar (R).

KOTAYAM—

The Vidyaarthi Mitram Book Depot, P. B. No. 8.

KOZHIKODE—

K. R. Brothers (R).

KUMTA—

S. V. Kamat.

LUCKNOW—

Acquarium Supply Co. (R), Faizabad Rd.
Balkrishna Book Co., Ltd., Hazaratganj.
British Book Depot, 84 Hazaratganj.
Civil and Military Educational Stores (R), Sadar
Bazar.
Eastern Book Co., Lalbagh Ed.
Ravi Advani, Hazaratganj.
Soehna Sahitya Depot (State Book Depot, U. P.).
Universal Publishers Ltd., Plaza Bldg.
Upper India Publishing House Ltd., Literature
Palace.

LUDHIANA (E. P.)—

Loyal Book Depot.
Mohindra Brothers (R).
Nanda Sty. Bhandar (R), Pustak-Bazar.

MADRAS—

Accounts Text Institute, P. B. 760 Egmore.
Book Dist. Service (R).
C. Subhish Chetty & Co., Triplicane.
Higginbothams.
K. Krishnamurti, Mount Road.
M. Palme & Co., 3, Pycrofts Rd.
Praparch Adarsine (R), 5, Vurabadram St.
Presidency Book Supplies, S. Pycrofts, Triplicane.
Sinhnam Publishing Co.

List of Agents for the sale of Government of India Publications as on 31-12-57—concl'd.

[Continued from inner side of the back cover.]

- MADRAS—cont'd.**
South India Traders.
*Supdt., Govt. Press, Mount Road.
Vardhacharya & Co.
- MADURAI—**
E. M. Gopal Krishna Kone, North Chitra Street.
Oriental Book House, 258, West Masi St.
Vivekanda Press, 48, West Masi Street.
- MANDSAUR—**
Sikhwal News Agency.
- MANGALORE—**
Kanara College Book Co. (R).
U. R. Shenoy & Sons, Car Street.
- MASULIPATNAM—**
M. Seshachalam & Co.
Triveni Publishers.
- MEERUT—**
Chandra Bhan Puran Chand (R).
Hind Chitra Press.
Lyall Book Depot.
Prakash Educational Stores.
Universal Book Depot.
- MORADABAD—**
National Book Depot.
- MYSORE—**
Chandra Stores, New Statue Circle (R).
H. Venkataramlah & Sons, New Statue Circle.
J. Nanumal & Sons, Landsdown Bldgs.
Juvana Pustakalaya (R).
Peoples Book House, opp. Jagan Mohan Palace.
- MUZAFARPUR—**
Sri Krishna (R), Said Ali Rd.
- NAGPUR—**
New Book Depot, Modi No. 3, Sitabuldi.
*Supdt., Govt. Ptg.
Western Book Depot.
- NAINTAL—**
Consul Book Depot.
- NEW DELHI—**
Ajmeri Gate Paper & Sty. Mart., 1/6B, Block,
Ajmeri Gate Extn.
Amrit Book Co., Connaught Circus.
Anand Book House (R).
Bharat Law House (R), Karolbagh.
Bhawani & Sons, Connaught Place.
Central News Agency, Connaught Circus.
Empire Book Depot, 278, Allganj, Lodi Road.
English Book Stores, 'L' Block, Connaught Circus.
Faqr Chand Marwah & Sons, Khan Market.
Gupta Stationery Mart (R).
Hind Book House (R).
Jain Book Agency, Connaught Place.
Jayna Book Depot, Bank Street, Karol Bagh.
Luxmi Book Stores (R).
Mehra Brothers, 50-G, Kalkaji.
Mohanlal & Sons, Karol Bagh, New Delhi.
Navug Traders, Karol Bagh.
Oxford Book & Stationery Co., Scindia House.
Peoples' Publishing House (R), M. M. Rd., New
Delhi.
Raj Book Depot, 1, Bengali Mal Market.
Ram Krishna & Sons (of Lahore), 13/13, Connaught
Palace.
Saraswati Book Depot, 15, Lady Hardinge Road.
Shama Bros. (R).
Sikh Publishing House Ltd., 70/C, Connaught Place.
Suneja Book Centre, 24/90, Connaught Circus.
Taneja Book & Stationery Mart, Raisinha Road.
The Varsity Book Depot (R).
United Book Agency, 47, Amritkaur Market,
Paharganj.
- ONGOLE—**
Shri D. Sreekrishnamurthy, Prop. Abhyudaya Book
Circulating Co.
- PALGHAT—**
Shri V. K. Ramalingam Vadakkanthara (R).
- PATANKOT—**
The Krishna Book Depot.
- PATIALA—**
Jain & Co., Bazar Shah Nashin.
*Supdt., Bhupendra State Press.
- PATNA—**
Bengal Law House (R).
Bharati Bhawan (R).
J. N. P. Agrawal & Co., Padri-ki-Haveli.
Lakshmi Trading Co., Padri-ki-Haveli.
Moti Lal Banarasi Dass.
- PATNA—cont'd.**
Novelty & Co. (R).
Pabuja Brothers Rajendra Path (R).
Scientific Book Co. (R).
*Supdt., Govt. Printing, Bihar.
- POONA—**
Deccan Book Stall, Ferguson College, Square Road.
Imperial Book Depot, 266, M. G. Road.
International Book Service, Deccan Gymkhana.
N. R. Bhalerao, 602, Shanwar Peth.
Raka Book Agency.
- PUDUKKATTAI—**
P. N. Swaminatha Sivam & Co., East Main Street.
- RAIPUR—**
Kasimud-Din & Sons, Gole Bazar (R).
Sahitya Bhandar (R), Girdhar Bhawan.
- RAJKOT—**
Mohan Lal Dossabhai Shah.
Sahitya Sangam, near Coronation Garden.
- RANCHI—**
Crown Book Depot.
Ideal Book Stores, Main Road.
- REWA—**
Goyal Brothers.
*Supdt., Govt. State Emporium.
- ROORKEE (U.P.)—**
Cambridge Book Depot (R).
- SAGAR—**
Students Book Depot (R).
- SECUNDERABAD—**
Hindusthan Diary Publishers.
M. Srishachalam & Co. (R).
- SILCHAR (ASSAM)—**
Shri Nishithi Sen (R).
- SHILLONG—**
Chapla Book Stall (R).
*Supdt., Assam Sect. Press.
- SIBSAGAR (ASSAM)—**
T. Chutiya (R).
- SIMLA—**
Azad Kitab Mahal, Stall No. 13.
J. Roy & Sons (India) Ltd.
Maria Brothers, 94, The Mall (R).
Minerva Book Shop, The Mall.
New Book Depot.
*Supdt., Himachal Pradesh Govt.
- SONEPAT—**
United Book Agency.
- SRINAGAR—**
The Kashmir Book Shop, Residency Road.
- SURAT—**
Rachuatnik (R).
Sree Gajanan Pustakallaya, Tower Road
- TRICHINOPOLY—**
Kalpana Publishers.
Paianippa Brothers, Teppakulam.
S. Krishnaswami & Co., Teppakulam.
- TRIVANDRUM—**
International Book Depot, Main Road.
Shri V. Rama Sharma (R).
*Supdt., Govt. Press, Travancore-Cochin.
- TUTICORIN—**
Shri K. Thilagaranjan (R).
- UDAIPUR—**
Rajasthan Stores, outside Suraj Pole, Oswal
Bhawan.
Vidya Bhawan (R).
- UJJAIN—**Manak Chand Book Depot (R), Patni Bazar.
- VARANASI—**Bhartendu Pustak Mandir (R).
- VILLORE—**S. Venkatasubhan, Law Booksellers.
- VISAKHAPATNAM—**
Book Centre, 11/97, Main Road.
Gupta Brothers, Vizla Buildings.
M. S. R. Murthy & Co.
- WALTAIR—**
Swaraja Bhandar, Bhaji Market.
- Govt. of India Kitab Mahal, Janpath
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