



J.D.R. del. W.H. Sc. sculp.

RHODODENDRON DALHOUSIÆ, Hook. fil.  
(in its native locality)

Scot. Botanic Garden, Glasg.

THE  
RHODODENDRONS  
OF  
SIKKIM-HIMALAYA;

AN ACCOUNT, BOTANICAL AND GEOGRAPHICAL, OF THE  
RHODODENDRONS RECENTLY DISCOVERED IN THE MOUNTAINS OF EASTERN HIMALAYA,  
FROM  
DRAWINGS AND DESCRIPTIONS MADE ON THE SPOT,  
DURING A GOVERNMENT BOTANICAL MISSION TO THAT COUNTRY;

BY  
JOSEPH DALTON HOOKER, R.N., M.D., F.R.S., F.L.S.,  
*fr. fr. fr.*

EDITED BY  
SIR W. HOOKER, K.H., D.C.L., F.R.A.S., & L.S.,  
Vice-President of the Linnean Society, and Director of the Royal Gardens of Kew.



KINCHI-JUNGA Kew.28,1784j as seen from DARJEELING.

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1849.



TO  
HER ROYAL HIGHNESS,  
**THE PRINCESS MARY OF CAMBRIDGE,**

WHOSE TASTE FOR THE PLEASURES OF A GARDEN,

THE FIRST AND PUREST PLEASURES OF OUR RACE, HAS MADE HER FEEL PECULIAR INTEREST IN

THE GREAT RATIONAL ESTABLISHMENT AT Kew,

AND WHO,

CONJOINTLY WITH HER ROYAL PARENTS,

HAS EVER BEEN FORWARD IN PROMOTING WHATEVER MIGHT TEND TO ITS USEFULNESS AND EMBELLISHMENT,

**THE FOLLOWING FIGURES AND DESCRIPTIONS**

OF A SERIES OF EMINENTLY BEAUTIFUL PLANTS, DESTINED SHORTLY TO ADD NEW LUSTRE TO ITS TREASURES,

**ARE MOST HUMBLY DEDICATED,**

BY HER ROYAL HIGHNESS'S DUTIFUL AND OBEDIENT SERVANT,

**THE EDITOR.**



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# PREFACE.

**D**ARJEELING, in the Sikkim portion of the Himalaya, the native country of the plants figured and described in the following pages, is situated in lat. 27° N., and long, the same as Calcutta, from which it is distant about 880 miles. Its elevation above the sea is 7,200 feet. The mean temperature of the year is about 55° of Fahrenheit, and that of each month, as detailed in a Calendar communicated by Dr. Campbell, the Hon. the E. I. C. Resident at Darjeeling, to the late Lord Auckland, and now lying before me, is as follows:—

January . . . . 41°	May . . . . . 59°	September . . . . 61° W
February . . . . 48°	Jane . . . . . 64°	October . . . . . 58° 50*
March. . . . . 58° 5C	July . . . . . 65°	November < . . . . 48°
April . . . . . 67°	August . . . . . 65°	December . . . . . 44°

" In five years<sup>p</sup> further observes Dr. Campbell, " there have been three heavy falls of snow: one in December, 1842 ; one in January, 1839; and one in February, 1841."

The mountain Sinchul, upon a spur of which, looking north, Darjeeling stands, attains an elevation of 9,000 feet, and to the west of it, next Nepal, rises another conspicuous mountain, Tonglo, reaching a height of 10,000 feet. Due north of Darjeeling, at a distance of only sixty miles, the horizon is bounded by the great snowy range (as seen, or rather attempted to be shown, in the vignette of the title-page), having for its principal feature the peak of KINCHIN-JUNGA, which has lately been ascertained to be 28,172 feet in elevation, the loftiest mountain yet known in the world. Dr. Hooker thus describes his first impressions of this scene:—" Much as I had heard and read of the magnificence and beauty of Himalayan scenery, my highest expectations have been surpassed! I arrived at Darjeeling on a rainy misty day, which did not allow me to see ten yards in any direction, much less to descry the Snowy Range, distant sixty miles in a straight line. Early next morning I caught my first view, and I literally held my breath in awe and admiration. Six or seven successive ranges of forest-clad mountains, as high as that whereon I stood (8,000 feet), intervened between me and a dazzling white pile of snow-clad mountains, among which the giant peak of Kinchin-junga rose 20,000 feet *above* the lofty point from which I gazed! Owing to the clearness of the atmosphere, the snow appeared, to my fancy, but a few miles off, and the loftiest mountain at only a day's journey. The heavenward outline was projected against a pale blue sky; while little detached patches of mist clung here and there to the highest peaks, and were tinged golden yellow, or rosy red, by the rising sun, which touched these elevated points long ere it reached the lower position which I occupied.

" Such is the aspect of the Himalaya range at early morning. As the sun's rays dart into the many valleys which lie between the snowy mountains and Darjeeling, the stagnant air contained in the low recesses becomes quickly heated: heavy masses of vapour, dense, white, and keenly defined, arise from the hollows, meet over the crests of the hills, cling to the forests on their summits, enlarge, unite, and ascend rapidly to the rarefied regions above,—a phenomenon so suddenly developed, that the consequent withdrawal from the spectator's gaze of the stupendous scenery beyond, looks like the work of magic." Such is the region of the Indian Rhododendrons.

Perhaps, with the exception of the Rose, the Queen of Flowers, no plants have excited a more lively interest throughout Europe than the several species of the genus *Rhododendron*,<sup>1</sup> whether the fine evergreen foliage be considered, or the beauty and profusion of the blossoms; and it may probably be said with truth, that no kind of flowering shrub is so easily, and has been so extensively, cultivated, or has formed so vast an article of traffic, as that one oriental species to which the name seems more immediately to have been given, the *Rhododendron Ponticum*. Its poisonous qualities, too, have tended to bring it the more into notice; for, to eating the honey collected by the bees from that plant, (as well as from the *Azalea Pontica*.) in the neighbourhood of Trebizond, during the celebrated retreat of the Ten Thousand, were attributed the dreadful sufferings of the Greeks; so severe that their actions were said to resemble those of drunken persons or madmen. Major Madden has stated that cattle sometimes perish by feeding upon the foliage and flowers of *Rhododendron arboreum* in the mountains of Kamaoon. Dr. Hooker remarks, on a recent tour while exploring the mountain-passes leading into Thibet,—" Here are three Rhododendrons, two of them resinous and strongly odoriferous; and it is to the presence of these plants that the natives attribute the painful sensations experienced at great elevations."

The *R. Ponticum*, which inhabits the mountains of Asia Minor and extends as far west as Spain and Portugal, together with *R. ferrujineum* and *hirtum* of the European Alps, *R. Dahuricum* of Siberia; *R. Chamadstm* of the Austrian and Piedmontese mountains, *B. maximum* of the United States of America, and the arctic *B. Lapponicum*, were all the kinds known to Linnaeus and to the botanical world so recently as 1764. The beautiful *R. chnjsanthum* of Northern Siberia appeared in Linnaeus' Supplement. Gmelin added the *R. Kamtschaticum* from Okotsk and Behring's Straits, and Pallas the charming *R. Caucasicum* from the Caucasian Alps.

Towards the very close of the 18th century, namely in 1796, *B. arboreum*, the first of a new form and aspect of the genus, and peculiar to the lofty mountains of India Proper, was discovered by Captain Hardwicke, in the Sewalic chain of the Himalaya, while he was on a tour to Sireenagur. The species has since been found to have a very extended range. It was published in 1805 by Sir James E. Smith, in the "Exotic Botany" of that author, and is characterized by its arborescent stem, very rich scarlet flowers, and leaves that are silvery on the underside. Sir James, on the authority no doubt of Captain Hardwicke, gives the height of the tree at twenty feet; but Major Madden, who found it on the mountains of Kamaoon, at elevations of from 3,500 to 10,000 feet, says he might safely have doubled that measurement. On Binaur, a *trunk* was found to be thirteen feet in girth, and another at Nynee Tal, sixteen feet; while a third, at Singabee Devee, was fourteen feet and a half in the circumference of the stem at five feet from the ground.

<sup>1</sup> So called, as is well known, from *fin*, a rose, and *fecty*<sup>TM</sup>, a tree: a name, however, which was given with equal justice to the Bose-bay, *Nerium Oleander*\* the *faMfa* of the modern Greeks.

It does not appear on record by whom the *Tree Rhododendron* was first introduced into Europe, probably by Dr. Wallich, about the year 1827. We know that to that distinguished botanist we owe the discovery, and the possession of most of them in our gardens, of other noble Indian species, such as *R. fimosum*, *B. barbatum*, *B. nobik*, *B. campanriatum*, *R. dnnamomeum*, with their many varieties, the limits of which are not clearly defined; and the facility these kinds afford for hybridizing with *R. arboreum*, thereby rendering the produce more hardy, has occasioned the original type of this latter species to be almost lost to our gardens.

*R. Magirimm* (Bot. Mag. t. 4381) was introduced to our gardens by Messrs. Lucombe, Pince, and Co., of the Exeter Nursery, a species assuredly quite, and permanently, distinct from *B. arboreum*, though published and figured under that name in Dr. Wight's *Icones*. Dr. Wallich, about the same period, detected another distinct, but not less interesting, group of species, in Northern India, more allied to *B. ferru<sup>^</sup>ineum* and *& hirwtum*; namely *R. sebum*, *R. lepidotum*, and *R. Anthopogon*.

Drs. Horsfield, Blume, and Jack made known some species from the mountains of Java: they were *R. Java<sup>ncm</sup>* (a most lovely shrub, introduced to our gardens by Messrs. Veitch and Sons of Exeter, through their collector, Mr. W. Lobb, see Bot. Mag. t. 4336), *B. album*, *B. retusum*, *B. tubifrm*, *B. Malayanum*, and *B. Celebicum*. Blume, we believe, first noticed a species as being epiphytal, in Java ("supra arbores"), his *B. (Ffeya) album*. Mr. William Lobb informs me that several kinds are there epiphytal; and Mr. Low, who speaks of the fine Rhododendrons existing in Borneo, particularizes one which inhabits invariably the trunks of trees, and which he had the good fortune to send to **England alive, though we fear it has not been preserved in our collections.**

What may be the number of species, or what the kinds, detected by Mr. Griffith during his travels in Bootan, we do not learn from the volume of his Posthumous Papers recently published at Calcutta by Mr. M'Clelland; nor am I aware whether Dr. Wight has published the whole of them in the paper of that gentleman, in the Calcutta Journal of Natural History, vol. viii., on certain Rhododendrons of Mr. Griffith. In Dr. Wight's *Icones* he figures and describes only two, *R. grande* and *B. Griffithianum*; both very distinct from any found by Dr. Hooker in the adjacent territory of Sikkim. And in proof of the prevalence of the genus in Bootan, it maybe observed that Mr. Griffith, in his Journal, when speaking of one single excursion (to Doonglala Peak, 12,478 feet of elevation), enumerates no less than eight distinct species; viz. :—

v

\* *Floribus in racmũ umbellũ/vrmibus.*

1. *R. arboreum*) arboreum, foliis oblongo-obovatis subtus argenteis.
2. *R. femgi\*eiM'*, arboreum, foliis obovatia supra rugosis subtus femigineis.
3. *B. —*; frutuospm, foliis oblongis subtus ferrugineo-lepidotis.
4. *R. ettipicum*; fruticosum, foliis ellipticis.
- B. *R. —*; fruticosum, foliis ellipticis basi cordatis subtus glands reticulatis.
6. *R. —*; fruticosum, foliis lanceolatis oblongis sub-obovatis subtus punctatis.
7. *JS. undulatum*; fruticosum, foliis dongato-lauoelatis undulatis subtus reticulatis.

\*\* *Floribus solUariis.*

8. *R. microphyllwn*; fruticosum totum ferrugineo-lepidotum, foliis lanceolatis parvis.

In another place in Bootan (Pass of Rodoola, 12,000 feet), Mr. Griffith speaks of Rhododendrons as the only vegetation at the summit, and in the descent he traversed a "region of Rhododendrons/

It is not our intention, nor is it required by the nature of this little treatise, to enumerate all the Rhododendrons that are known in books: suffice it to say, that (exclusive of some Azaleas of Linnaeus) thirty-two are distinguished by De Candolle in the seventh volume of his *Prodromus*, published in 1839; and enough has been here stated to show that the maximum of the species exists in Asia; for, commencing with Borneo and other Malayan islands in the tropics of the southern hemisphere, and proceeding north, we find them recorded in the mountain regions of all the intervening countries that have been botanically investigated, even to northern and extreme arctic Siberia. As we proceed westward into Europe, they gradually disappear, one only inhabiting Sweden and Norway (*B. Lapponicum*), and that seems not to extend to the western coasts.

In the vast continent of North America, the cool hilly grounds, with moisture, of the middle and southern states, yield only *R maximum* (which, however, is found also in Canada), *B. macrophyllum*, Don, confined to the west side of the Rocky Mountains, *B. Catawbiense* and *R punctatum*, which two have a very limited range. The anomalous *R albiflorum*, with white flowers and deciduous leaves, is only seen in the Rocky Mountains, about lat. 52°. As might be expected, in the alpine and arctic regions the northern European kinds appear; for example, *B. Lapponicum* has been detected on the White Mountains, Massachusetts, on the summit of Mount Mary, Essex County, New York, at an elevation of 5,400 feet on the Rocky Mountains, in Labrador, and along the coasts of the Polar Sea; while in Behring's Straits, the *B. Kamchaticum* again appears. No species grows in Mexico or near the coasts of Oregon or California, and none in the isthmus of Panama. Throughout the whole of Africa<sup>1</sup> and Australia, the genus is unknown; and it will be observed that it only enters the southern hemisphere through the medium of the Indian Archipelago.

When it is borne in mind that, as above stated, Mr. Griffith, in an excursion to one mountain in Bootan, detected eight species,<sup>2</sup> and that the author of the present work, during a very limited sojourn in Sikkim, and with little means of prosecuting extensive researches, owing to the nature of the country and the hostile feeling entertained towards the English by the Rajah, yet collected and described eleven species, of which nine were new, it may, I think, be fairly conceded that if the maximum of Rhododendrons be in Asia, their head-quarters are on the lofty ranges of the Eastern Himalaya, where the mild and moist atmosphere is eminently suited to their habit.—ED.

<sup>1</sup> Boissier, indeed, in his *Voyage Botanique en Espagne*, says of *Pentstemon* *Atlante*—but I know not upon what authority.

<sup>2</sup> How far these species may be recorded in the Herbarium of the Hon. the E. I. C. shall be a subject of great interest. It is now a subject of great interest to the Company; and there is no doubt that the Rhododendrons that have been edited by Dr. Wight we know to



THE  
RHODODENDRONS  
OF  
SIKKIM-HIMALAYA.

---

IT has been well remarked by the illustrious Wallich, (the Father of Nepalese Botany,) that in Nepal the genus *Rhododendron* claims the highest rank amongst the plants of that rich kingdom. From the proximity of Sikkim to Nepal, a similarity in the botanical features of these countries might be expected; and also that the difference should rather exist in individual species than in the genera or higher groups. The outline of the two countries is very similar, their latitude the same, so is their geology, and the difference in climate is slight, and only evident in the increased humidity of the eastern region.

Rhododendrons are distributed in Sikkim as they are in Nepal, crowning those sub-Himalayan hills which attain 7,000 feet of elevation, and at a still greater altitude increasing in number of species and individuals: some species being replaced by others which have no greater, perhaps less, apparent adaptation for resisting vicissitudes of climate, and yet accompanying several of the more local kinds throughout the elevations they severally attain.

I. As is frequently the case with large genera, one or more species, distinguished by peculiarity of distribution, often present some anomalies in botanical or other characters, whether in the unusual habit, mode of growth, or singular outline, colour, or more important feature. So it is with the Sikkim *Rhododendrons*. *S. Dalhousfa*, the only one found so low as at 7,000 feet, and thence upwards for 8,000 feet more, differs from all its congeners of Northern India in its epiphytal mode of growth,<sup>1</sup> its sweet-scented flowers, slender habit, whorled branches, and in the length of time during which it continues in bloom. It is much the largest-flowered species with which I am acquainted, and has more membranous leaves than any of the others. With all these striking anomalies, it does not, however, present one character of calyx, corolla, stamens, or pistil, entitling it to separation from the genus. In possessing a large foliaceous

<sup>1</sup> In Sikkim, *Vaccinium* offers a parallel case. The *V. serpent* (P), an epiphyte on very large trees, inhabits a much lower level and ranges through many more feet in elevation than any of its congeners. [In Borneo it will be remembered that Mr. Low discovered epiphytal *Rhododendrons*; and Mr. Thomas Lobb, several in Java. ED.]

calyx, it is one of the most perfect plants of the whole, and in its characters of flower and fruit is far more closely allied to the typical or scarlet-flowered group, than is the section to which the following belongs.

II. *Rhododendron Falconeri*, a white-flowered species, is eminently characteristic of the genus in habit, place of growth, and locality, never occurring below 10,000 feet. On the other hand it is peculiar in its ten-lobed corolla, numerous stamens, and many-celled ovary, superb foliage and many-flowered capitula. This multiplication of parts and development of foliage and trunk give it a striking appearance; but there is an almost total absence of calyx, an organ sufficiently evident in other species. It is allied to a species discovered by the lamented Griffith in Bootan, the *B. grande*, Wight, published in the Calcutta Journ. Nat. Hist. vol. viii. p. 176, [and since in Dr. Wight's Icones, vol. iv. p. 6.1.1202].<sup>1</sup>

III. A third white-flowered group contains but one Sikkim species, the *B. argenteum*, a very conspicuous tree at an elevation of between 8,000 and 9,000 feet. In beauty of foliage it nearly equals the last mentioned (*B. Falconeri*), and the flowers are larger than in any but *B. Dalhousia*, and of the same form as those of the scarlet group; the stamens are of the normal number, but the ovarium is many-celled. Though evidently distinct, this species combines the characters of most of the other groups. In size of flower and colour, as already observed, it resembles *B. Dalhousia*, as it does in its unusually membranous leaves;<sup>2</sup> in the colour of the flower, size of foliage, small calyx, and many-celled ovarium, *R. Falconeri*;—while the number of stamens, general habit, silvery under-surface of leaf, &c, connect it with *R. arboreum*?

IV. A singular set includes the dwarfish kinds to which *B. cinnabarinum* and *B. Boylii* belong. The flowers are small, the corolla is subcoriaceous, narrowed at the base of the tube, and its colour is a peculiarly dirty brick-red, somewhat iridescent with blue in bud, and its lobes are rounded, subacute, not notched or wrinkled. The calyces are small, coriaceous, and squamous in both; in one the lobes are remarkably unequal. In the number of stamens, cells of the ovarium, &c, they agree with the usual characters of the genus.

V. Of the normal or typical group, indicated to be such by the number of species it contains, by the prevalence of scarlet flowers, uniformity of corolla and number of parts, there are two subdivisions: one has a fully developed calyx, in the other the calyx is very small and coriaceous. *R. lancifolium* and *B. barbatum* represent the former section, in both of which that organ is as conspicuous as in *R. Dalhousia*. *R. arboreum*, *R. Wallichii*, and *R. Campbellia*, belong to the latter section. The species of this group known to me are all trees, of contracted range and gay flowers.

VI. The little *B. elagnoides* may be classed in another group: it is a very alpine plant, of which I possess only the foliage and fruit. Its scaliness (a character which seems most conspicuous in the smaller and more alpine species) allies it to *B. cinnabarinum*, but it is apparently single-flowered and calyculate.

The sub-E[imalayan mountains are surely the *centrum* of this truly fine genus, distinguished by the number and variety of its species and groups, by the great size and eminent beauty of several, which form conspicuous features in the landscape over many degrees of longitude, through a great variety of elevations, and clothe a vast amount of surface

<sup>1</sup> From this figure and description it will be seen, that although in many respects near *R. Falconeri*, especially in the dense many-flowered capitulum, smallish many-cleft corolla, numerous stamens and cells of the ovary, yet that it is quite distinct in the smaller white and scaly beneath, and in the deeply ten-lobed corolla. ED.

<sup>2</sup> The term *membranous* is of course used comparatively here; in no species is the foliage truly so, -fe<sub>M</sub> *coriaceous* were th<sub>h</sub>\* though more cumbrous, term. DeWcr,

»Dr. Hooker had here stated of *R. argenteum*, that *B. Griffithianum*, Wight, in Calcutta Journal of Natural History vol viii » 17. probably a close ally of this; but that has since been published in Dr. Wight's Icones Plant. India Oriental vol iv p. 6.1.1202. It is to belong to, or rather to constitute, a very distant section, having very lax racemose flowers, a nearly entire siliqua (quite unlike that of any other species), many (15 ?) stamens, and ten cells to the ovary. It is a native of Boitah. ED.

The Neelghenies, Ceylon, and the Malay Archipelago contain, each, some species which prove the affinity of their Floras to that of the Himalaya. The same is the case with the great mountains of Northern Asia, Central, Southern, and, especially, Eastern Europe, the Ural, and Pontus. The genus extends even to the Polar regions, diminishing in the size of the species and number as we recede from the Himalaya: in North America they appear again, though under a very different aspect from that they present on the subtropical mountains of Asia.

Wide though this distinction is, it is far from uniform, the Himalaya itself offering most remarkable anomalies. My friend Dr. Thomson (now engaged, in a botanical mission to Thibet) informs me that the genus is not found in Cashmere; nor, during all the wanderings of that intrepid and indefatigable naturalist in the Trans-Sutledge Himalaya and Thibet, has he met with one representative of it. He detected, indeed, in the country south of the Chenuab, both the *B. arboreum* and *B. campanulatum*, and which is probably their western limit.

In North-west India, the genus *Rhododendron* is first seen on the Kunawur hills, and advancing east, follows the sub-Himalayan range for its whole length, the species increasing in number as far as Sikkim and Bootan; thence the genus is continued to the Mishmee hills, the eastern extremity of the range, crossing the Brahmaputra to that lofty range which divides the water-shed of the Irawaddi from that of the Brahmaputra.

Though scarcely found, throughout this long line of upwards of 1,200 miles, below 4,000 feet, the Rhododendrons still affect a warm and damp climate, where the winters are mild. The English naturalist, who is only familiar with the comparatively small hardy American and European species, would scarcely expect this. A certain degree of winter-cold and perpetual humidity is necessary; but the summer-heat is quite tropical where some of the genus prevail, and snow rarely falls and never rests on several of those peculiar to Sikkim.

*22. arboreum*, according to Captain Madden, inhabits various localities between 3,000 and 10,000 feet: this is in Emaoon, where, of course, the genus would descend lowest; and the range is incomparably greater than that of any other species, at least of those found in Sikkim.<sup>4</sup> Dr. Griffith, after extended wanderings in Bootan, gives the limits of the genus in that country as between 4,292 and 12,478 feet, which is a lower level by 8,000 feet than they are known to descend to in Sikkim. In the extreme east of Assam, where the Himalaya itself diverges or sends lofty spurs to stem the Brahmaputra, on the Fhien Pass to Ava, Rhododendrons ascend from 5,400 to 12,000 feet, to the upper limit of **arboreous vegetation, and perhaps still higher.**

During my limited excursions in Sikkim, I gathered eleven species (and I believe that more exist), a greater number than Griffith obtained in Bootan; so that I cannot but regard this longitude as the head-quarters of the genus in the Himalaya, and that chain as the especial region of the genus in the Old World. Here too I may remark (as is the case with the *Conifera* of Tasmania and *Cactea* of Mexico), the species are most limited in habitat, where, numerically, the genus is the largest, the *JB. arborem*, however, having a much wider range than any other species found in Sikkim.

<sup>4</sup> Dr. Hooker had here inserted "where *R. arboreum* is unknown" that is, in Sikkim. But one of his own excellent figures, sent home as representing a new species, is, I have no hesitation in saying, the true *R. arboreum*, coinciding entirely with the original figure of Sir James E. Smith (Exotic Botany, Tab. 6), and with original specimen given me by Miss Anne Flaxman, a distinguished botanist and existing in my own Herbarium. Nor need we be surprised that Dr. Hooker should have fallen into this error, with few books and no authentic specimens to consult; especially when it is borne in mind that his eye had been accustomed to the plants that pass under that name in our gardens, but which have been so hybridized by cultivators, either to increase their beauty or with the intention of rendering the offspring more hardy, that an original plant or tree of *Rhododendron arboreum* is almost as rare in England as is the normal single-flowered state of the *Corcora*\* (*Kerria Japonica*). Let it be further observed that other distinguished Botanists have confounded distinct species with the *R. arboreum*: I allude especially to the plant so called by Dr. Wight of the Neelghenies (Lxmes Hant. Ind. Orient, tab. 1201), which is the *K. Mkgmtum* of Zenker (Plant. Nilag. cum la, and of Bot. Mag. tab. 4381). No one who compares native specimens of these two plants can have any hesitation in pronouncing them distinct. ED.

Westward again, as far, indeed, as the western termination of the Himalaya, the species descend lower than in Bootan: an anomalous fact, for which, in our ignorance of the contrasting features which may distinguish the Eastern from the Central Himalaya, I can only assign conjectural causes. Among these may be the proximity of the ocean to the Sikkim portion of the range, and the presence of heavy mountain-masses covered with winter, and even perpetual, snow, to the south and east of the upper extremity of the Brahmaputra, whereas the genus is found nearly 2,000 feet lower than in Sikkim. The descent of the snow line in Upper Assam to 14,000 or 15,000 feet, is no doubt due to the same causes, and this is a most remarkable fact. Uniformity of temperature, excessive humidity, and a broken surface, produce the same effect here as in the high southern and antarctic latitudes,—favouring the formation of snow and its permanence, and also extending the range of tropical forms upwards to a greater elevation, and the descent of temperate or arctic forms to a lower one; of which no stronger proof can be required than the descent of *Bwacea* and *Erica*, and the great elevation which *Rafflesia*, *Balanopkora*, and other eminently tropical genera, attain on the Himalaya.

Too much stress cannot be laid upon this fact, that the snow-line ascends with the latitude on the Himalaya, from 14,500 feet at its south-east extreme in Upper Assam, south of the Brahmaputra, lat. 27° N., to 20,000 feet at its north-west extreme in the regions near and beyond the Sutledge, in lat. 36° and 37° N. Had the level of perpetual snow remained uniform throughout these 600 miles of northing, then climate would have only annihilated the effect of distance from the equator. But if we allow that, *ceteris paribus*, a degree of latitude is the index of a change of 300 feet in the snow-line, we must also allow that the limit of perpetual snow is 8,000 feet lower in Upper Assam than its height on the Sutledge Himalaya would indicate, being 15,000 instead of 23,000 feet; and, *vice versa*, that if 14,500 is that limit at Assam, as determined by latitude alone, in Kunawur we should have it at 11,000 instead of 20,000.

Only four species, *B. Dalkousw*, *B. Campbellia*, *R. argenteum*, and *R. arboreum* grow near Darjeeling. The second and fourth form scattered bushes at 7,500 and 8,000 feet: the *B. argenteum* is a small tree, at 8,000 and 9,000 feet, strangely associated with *Balanopkora*, *Convallaria*, *Paris*, *Spkaropteris*, *Laurus*, and *Magnolia*.

It was on the ascent of Tonglo, a mountain on the Nepalese frontier, that I beheld the Rhododendrons in all their magnificence and luxuriance. At 7,000 feet, where the woods were still dense and subtropical, mingling with Ferns, *Potkos*, Peppers, and Figs, the ground was strewn with the large lily-like flowers of *B. Dalhousia*, dropping from the epiphytal plants on the enormous Oaks overhead, and mixed with the egg-like flowers of a new Magnoliaceous tree, which fall before expanding and diffuse a powerful aromatic odour, more strong, but far less sweet, than that of the *Rhododendron*. So conspicuous were these two blossoms, that my rude guides called out, "Here are lilies and eggs, Sir, growing out of the ground!"—No bad comparison. Passing the region of Tree-Ferns, Walnut, and Chestnut\* yet still in that of the Alder, Birch, large-leaved Oak (whose leaves are often eighteen inches long), we enter that of the broad-spathed *Arum* (which raises a crested head like that of the Cobra de capel), the *Kadmra*, *Stauntonia*, *Convallaria*, and many *Bosacea*. The paths here are much steeper, carried along narrow ridges or over broken masses of rock, which are scaled by the aid of interwoven roots of trees. On these rocks grow *Hymenophylla*, a few *Orckidea*, *Begonia*, *Cgtrandracea*, *Aroidea* of curious forms, the anomalous genus *Streptolirion* of Edgeworth, and various *Cryptogamia*, and the *Rhododendron arboreum* is first met with, its branches often loaded with pendulous mosses and lichens, especially *Usnea* and *Borrera*. Along the flat ridges, towards the top, the Yew appears with scattered trees of *Rhododendron argenteum*, succeeded by 22. *CampbeBta*. At the very summit, the majority of the wood consists of this last species, amongst which and next in abundance occurs the *B. barbatton*, with here and there, especially on the eastern slopes, *B. Falconeri*.

Mingled with these are *Pyri*, *Pruni*, Maples, Barberries, and Azaleas, *Qka*, *Bess*, *Limonia*, *Hydrangea*, *seven!* *Capri\** *foliacee*, *Gaultheria*, and *Andromeda*; the Apple and the Rose are most abundant. *Stauntonia*, with its glorious raceme\* of purple flowers, creeps over all; so do *Kadsura und 'Ochna*; whilst a Currant, with erect racemes, grows epiphytally on *Rhododendron* and on *Pyrus*.

The habits of the species of *Rhododendron* differ considerably, and, confined as I was to one favourable spot by a deluge of rain, I had ample time to observe four of them. *R Campbelli\**, the only one in full flower early in May, is the most prevalent, the ropes of my tent spanning an area between three of them. Some were a mass of scaiiet blossom, displaying a sylvan scene of the most gorgeous description. Mr. Nightingale's<sup>1</sup> *Rhododendron* groves, I thought, may surpass these in form and luxuriance of foliage, or in outline of individual specimens; but for splendour of colour those of the Himalaya can only be compared with the *Butea frmba* of the plains. Many of their trunks spread from the centre thirty or forty feet every way, and together form a hemispherical mass, often forty yards across and from twenty to fifty feet in height! The stems and branches of these aged trees, gnarled and rugged, the bark dark-coloured and clothed with

<sup>1</sup> At Embley near Bomsey, Hants, the seat of William Edward Nightingale, Esq., whose beautiful grounds boast of drives through what may really be called woods or groves of *Rhododendrons*, many of them self-sown.—The mention of these grounds (adorned with exotic *Rhododendrona*) by a naturalist luxuriating amidst the aboriginal species of the lofty mountains of Sikkim-Himalaya, makes me desirous to introduce here a brief notice of the plants in question. I could not trust my own memory for a correct statement of what it has been my privilege to see, but Hiss Nightingale has obligingly communicated to me the following particulars :—

"Our *Rhododendrons* were chiefly planted about thirty year ago: the largest number aze in an exceedingly wet 'bottom' of deep black peat full of drafs, sheltered with sloping banks of Birch and Fir, with a good deal of Laurel, large *Kalmias* and *Asalea* near the road. This part was originally a nursery-garden of about four acres: the shrubs have been cut continually to keep the road clear, and now make a bank seventeen or eighteen feet high. They are scattered over the high ground (a dry black sand) for about two miles, where they cover another bank of heathery soil and another bottom of the deep peat. There are not above a dozen of the *B.mammmamgKt* them, and about three times as many of the *arboreum* and hybrid *Scarlets* which we find quite hardy, but which seem to flower best in the high and dry situations. The *Ptmtem* and var. *m e m* seed themselves to a great extent, and the consequence is an immense variety in the ~~shape, size, and colour of the flowers, hardly any two plants being quite alike.~~

"The largest single *Rhododendron* is one hundred and fifty feet round and twenty feet high: there are several of ninety-seven and ~~thirty-~~ eight feet round, but these have been cramped for room by their neighbours. The tallest I can find grows between a Birch and a ~~Portugal Laurel,~~ and is twenty-five feet high, its single upright stem measuring nineteen inches in circumference. It is quite an exception, for they fork generally immediately on emerging from the ground; and though there is one which measures five feet ten inches in the girth of its trunk an inch from the ground, yet as he leaves his good ways and divides immediately after, I am not sure you will grant him his diploma as a tree. The forks are from d^hteen inches to two feet in circumference. The variegated kind, with long footatalb to tfo flowers, haa perhaps ta ~~thickest stem~~ *wijji.us*. The outside branches of the large individuals root themselves all round and make impenetrable thickets.' We plant out the ~~s,~~ which come up very thickly wherever an open space gives them room, and they are now scattered over most of the wild ground about. ~ « I think this is pretty nearly all we have to tell, but we may add that the *Eafamaa* and *Tdlow Azslea* are some at them ten feet high and wide in proportion!<sup>1</sup>

It may be interesting to record some particulars of another favoured spot for *Rhododendrons*, namely, Penllergare, Glamorgan, the seat of MIwyn Llewellyn, Esq., who writes in reply to my queries :—

"The soil and climate of this district siut that class of plante ^ ^ as is attested by the seedlings of the common *Rhododendron Pentstemon*, which appear in thousands throughout our woods. The rough sketch I enclose is of this species: it measures in height fifteen feet ten inches, and completely covers a circumference of one hundred and ten feet. The plant grows by itself upon a lawn, without any trees to overshadow or interfere with it, and it forms a perfectly symmetrical and compact shrub, with dense foliage and short-jointed wood.

"We have also a specimen of *R.artoreim,yu. rouunh r f a f a f m* inches in height, and in circumference forty-eight feet: it was planted fifteen years ago and has never received the slightest protection. Like the last, it stands alone on a lawn, and is of a beautifully compact form. It has 8,200 flower-buds now upon it. The single stem from which it rises measures one foot nine inches in girth.

« The American species also flourish here with great vigour. A specimen of *R. Catawbiente* measures nine feet six inches in height, and covers forty-one feet six inches in circumference: this, however, is much younger than either of the preceding. It is also growing under the shade of large oak-trees, for which reason it is somewhat drawn and not so fine and thick in its growth as it might otherwise have been.

It may be observed that Mr. London, in his Arboretum Britannicum, has not described any specimens of *Rhododendron\* arboreum* of the size above given. The largest he has noticed are at Wimbledon House, thirty-three feet in the spread of its branches; at OoAidls in Hampshire, thirty-nine feet ditto; Wobuin Abbey, twenty-eight feet ditto; Shipley Hall, Derbyshire! %-aix feet ditto, and sixteen feet the greatest height. ED.

spongy moss, often bend down and touch the ground: the foliage, moreover, is scanty, dark green, and far from graceful; so that notwithstanding the gorgeous colouring of the blossoms, the trees when out of flower, like the *Fuchsias* of Cape Horn, are the gloomy denizens of a most gloomy region. *R. CampbeUia* and *R. barbaium* I observed to fringe a little swampy tarn on the summit of the mountain,—a peculiarly chilly-looking, small lake, bordered with *Sphagnum*, and half-choked with *Carices* and other sedges: the atmosphere was loaded with mist, and the place seems as if it would be aguish if it could, but was checked by the cold climate. *R. barbatum* had almost passed its flowering season: it is a less abundant and smaller tree than the last mentioned, but more beautiful in the brighter green and denser foliage, clean, papery, light-coloured bark, the whole forming a more picturesque mass.

Along the north-east and exposed ridges only, grew the *R. Falconeri*, in foliage incomparably the finest. It throws out one or two trunks, clean and smooth, thirty feet or so high, sparingly branched: the branches terminated by the immense leaves, deep green above, edged with yellow, and rusty red-brown below. The flowers are smaller, but more numerous in each head than in the two last mentioned (*R. Campbettia* and *R. barbatum*).

The temperature of the earth in which the above species grew, was, in the middle of May, at twenty-seven inches below the surface where the roots are chiefly developed,  $49^{\circ} 5'$  at all hours of the day: that of the air varied from  $50^{\circ}$  to  $60^{\circ}$ .

In naming the new species before me of this eminently Himalayan genus, I have wished to record the services of some of those gentlemen who, besides Mr. Griffith (to whom a species had been already dedicated by Dr. Wight), have most deeply studied the vegetable productions of the country: they are Drs. Wallich, Royle, and Falconer. With their names that of Dr. Campbell, the Political Resident at Darjeeling, author of various excellent Essays on the Agriculture, Arts, Products, and People, &c., of Nepal and Sikkim, is no less appropriately associated; and in compliment to his amiable Lady I designate that *Rhododendron* which is most characteristic of Darjeeling vegetation; while to the Lady of the present Governor-General of India, I have, as a mark of grateful esteem and respect, dedicated the noblest species of the whole race. *J.D.H.*



## RHODODENDRON DALHOUSLE, a\*,

*Ladg Dalhousie's Rhododendron.*

## TAB. I., II.

Xn4k.g ad% ranxb ranofm verticflktis vage patentibos, Mis obovato-dl^tidB obtolb oonäoco-membtanaoais sobter paOidieiribiu wgm\*  
 " rnfö^unctatis, baai in petiohm attenuatis, floribuB (ampin albis) 8-7 captahNlmbdlatis, lobu calycñtu fbliaoëu oblongs obtaltf,  
 . coro&eem^ilatabaaiprofundeS-foY^ a, staminibus 10 filamentis inferno pilosis, ovario 5-loculari.

HAB. Parasitical on the trunks of large trees, especially Oaks and Magnolias. Sikldin-Himalaya: elevation 7,000-9,609 feet\* April  
 to July.

A straggling *shrub*, six to eight feet high, always seen growing, like the tropical *Orchidea*, among moss and Ferns and *Aroidea*, upon the trunks of large trees: the *stems* clothed with a reddish papery bark, the *branches* sbrmsjgling, patent, whorled, the whorls distant; each branch bearing its leaves and flowers only at the extremity. *Leaves* few, patent tmrreflexed, petiolate, about four inches and a half to five in length, eltiptical-obovat\* between coriaceous and membranaeous, obtuse at the base, attenuated below into a more or less downy *footstalk*, about half an inch long, the margin plane (not revolute), the upper surface darkish-green, inclining to a yellow hue, even on the surface, beneath paler, dotted jrith very minute, scattered, rusty-coloured scales or points (scarcely sufficient to change the general tint), the mid-rib prominent, the rather close parallel *nerves* scarcely so. *Mowers* three to seven in a terminal, umbBmaf\* *head*, the spread of which is greater than that of the leaves. *Peduncles* nearly an inch long, stout, cylindrical, downy. *JBracteas* ligulate, membranaeous. *Calyx* large, deeply divided almost to the base into five ovato-dliptical, very obtuse, spreading, foliaceous lobes. *GoroUa* very large, three inches and a half to four inches and a half long, and as broad at the mouth, campanulate, white, with an occasional tinge of rose, in size and colour and general shape almost resembling that of the white Bourbon lily, *LUium candidum*, very fragrant. At the contracted base of the tube are five deep\*foveote. *Lobes* of the *limb* needy\* equal, very broad, rounded, waved, spreading. *Stamens* ten: *filaments* longer than the tube, curved upwards, downy below. *Anther* oblong-ovate, dark purple-brown. *Ovary* ovate, furfuraceous, five-celled, tapering into the thickened *style*, which is longer than the stamens. *Mgma* an orbicular, convex disk.

Certainly, whether we regard the size, the colour, or the fragrance of the bloHoms of this plant, flpy<sup>are</sup> th\* noblest of the genus *Rhododendron*. The odour partakes of that of the Lemon. In age the flowers assume a delicate roseate tinge, and sometimes become spotted with orange, which rather adds to, than detracts from, their beauty.

TAB. I. Represents a plant of *B. Dalbmsia*, on a very reduced scale, in its native locality.

TAB. II. Flo wiring branch- 1. Stamen. 2. Anther. 3. Pistil.—*natural Ase*. 4. Section of ovary. 5. Pollen with bojau:-Hmy«efaf.





## RHODODENDRON BARBATUM, *rm.*

*Bristly Rhododendron.*

### TAB. III.

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Arboreum, foliis elliptico-lanceolatis acatis basi obtasis coriaceis marginibus subrecurvis utrinque glaberrimis subtus pallidiaribus supra impresse venosis, petiolo tuberculoso longe ramulisque glanduloso-setosis, bracteis alabasticisque viscidis, floribus dense capitatis mediocribus sanguineis, lobis calycinis foliaceis viscidis ovato-ellipticis appressis, staminibus 10, filamentis glabris, ovarii glanduloso-hirsuti loculis 5-8.

KHODODENDRON barbatum. *Wail. Cat. no. 757. Don, Syst. Gard. and Bot. vol. iii. p. 844. Be Cand. Prodr. vol. vii. p. 721. Hook, in Bot. Mag. sub Tab. 4381; in Oard. Ghron. 1848 (with a wood-cut).*

HAB. Gossain Than, *WaUich.* Summit of Tonglo, in Sikkim-Himalaya, alt. 10,000 feet. *M. April.*

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A tree, from forty to sixty feet high, branched from the base. Main trunks few, inclined, compressed, clothed with reddish, papyraceous bark, destitute of lichens and Mosses. Branches numerous, floriferous at their apices. Leaves, in the very young state, sparingly hairy and ciliated; when fully developed, five to seven inches long, and from one and a half to two inches and more wide, elliptical-lanceolate, acute, rather broader above the middle, the margins reflexed and rough to the touch from the presence of minute harsh ciliae, penninerved; the nerves sunk on the upper surface, and there dull but full green, paler and quite glabrous beneath and destitute of scales or down of every kind, but turning to an ochraceous tint when dry. Petioles short, (half an inch) thick, somewhat tubercled and beset with long, rigid, black seta or hairs, glanduliferous at the point: these hairs or bristles often extend a little way up the mid-rib beneath. Mowers moderately sized, of a deep puce or blood-colour, collected into a compact, globose head, four to five inches in diameter. Bractees oblong or ovate, the inner ones silky, all more or less glutinous. Calyx large, scarcely silky, deeply cut into five, erect, large, foliaceous ovate lobes, half an inch long. Filaments ten, glabrous. Anthers short, and, as well as the nearly straight style, included. Ovary oblong, clothed with glandular hairs. Stigma small, obtuse. Fruit setose, rich brown, included in the persistent calyx.

One of the most beautiful of the Himalayan species, and readily distinguished by the bristly petioles and young branches. [Although in cultivation in England, at least in the Upton Nursery, Chester, of Messrs. Dickson, no coloured figure has yet been published. The present one will serve to show what a treasure is in store for our open borders, seeing that it has proved perfectly hardy in the Nursery above mentioned. ED.]

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TAB. m. *Rhododendron barbatum*, Wall.; flowering branch. 1. Mower and bract:—*natural size.* 2. Stamen. 3. Pistil. 4. Section of ovary |—*magnified.* 5. Capsule .—*natural size.*



J. R. & M. P. 1850

Eschscholzer & Eschscholzer

*ERIODODENDRON LANCHEIFOLIUM*, Hook. & Ait.

a

RHODODENDRON LANCIFOLIUM, *Hook. fl.*

*Lance-leaved Rhododendron.*

TAB. IV.

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Subarboreum, rands rugosis tortuosis, foliis oblongo-lanceolatis acutissimis coriaceis basi cordatis margine revolutis glabris, supra indistincte penninerviis viridibus subtus reticulatis luteis, petiolis tuberculoso-rugosb, floribus tenninalibus capitata majiBculia puniceis, lobia calycinis late obovatis foliaceis erosis, corollis reticulatis, staminibus 10, ovario dense villosa 5-8-loculari.

HAB. Interior of Sikkim-Himalaya. *Fl.* May.

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This constitutes a *shrub*, six to eight feet high, the *bark* reddish, papery, easily separating and falling off. *Branches* spreading, tortuous, wrinkled and knotted. *Leaves* chiefly at the extremities of the branches, three to four inches long, one to one inch and a half wide, coriaceous, oblong-lanceolate, very acute, the margins revolute, the base cordate, above foil green, penninerved, the nerves inconspicuous, beneath reticulated and tawny or yellow brown, quite glabrous on both sides, and destitute of dots or furfuraceous scales: *petioles* half an inch long, much wrinkled and tuberded, looking as if diseased, glabrous. *Mowers* of a moderate size, collected into a rather dense *head* at the ends of the branches. *Bracteas* small. *Peduncles* glabrous. *Calyx* large, cut almost to the base into five, obovate, slightly spreading, coloured, erose, foliaceous lobes. *Corolla* rich puce-colour, campanulate, distinctly reticulated, five-lobed, lobes rounded, waved. *Stamens* and *pistil* included. *Ovary* elliptical, densely shaggy with hairs, five to eight-celled. *Style* slender, flexuose. *Stigma* capitate.

Allied to the preceding, *B. barbatum*, but forming a stunted shrub, with very differently shaped leaves, tawny beneath when recent, the corollas reticulated, the calyx-lobes erose, and the plant is everywhere destitute of hairs except on the ovary, which is more shaggy than that of *R. barbatum*.

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TAB. IV. *Rhododendron lancifolium*. 1. Mower. 2. Pistil.—*natural size*. 3. Section of the ovary. 4. Pollen with tubes.—*magnified*.

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4.

## RHODODENDRON WALLICHII, n.«\*.p.

*Dr. WaUich's Rhododendron.*

TAB. V.

Fratescens, foliis coriaceis ellipticis acutis basi cordatis ~~super levissimis petiolisque glaberrimis marginibus revolutis subtus p. albidis~~ costam  
versus punctis femigmeis pulverolento-tomentosis, floribus 8-8 capitato-lacemosis, calycibus lobis brevissimis coriaceis aubacutis, ovarii  
glaberrimi loculis 5.

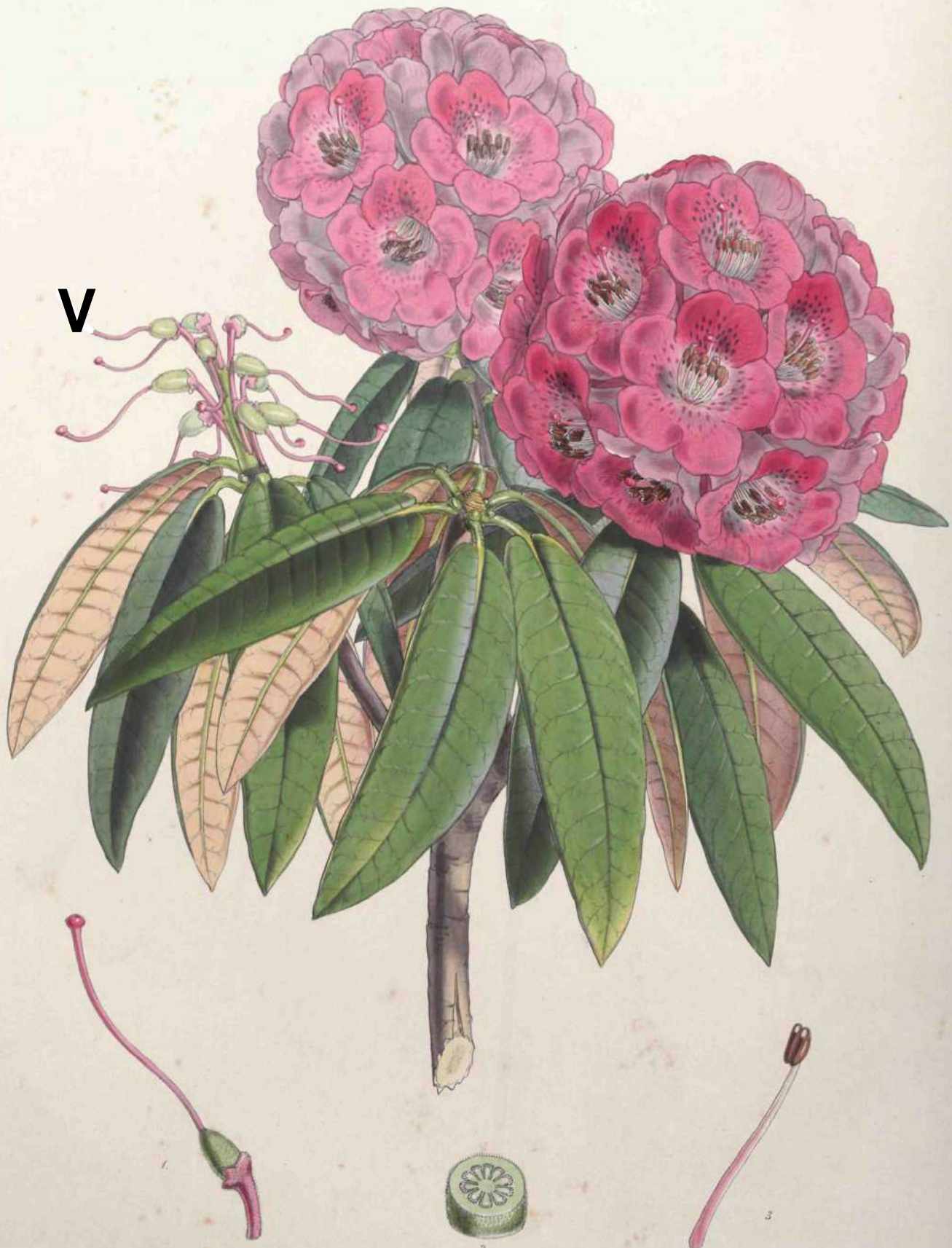
HAB. Interior of Siklim-Himalaya.

A *shrub*, attaining a height of from eight to ten feet, with the *branches* rugged, rather tortuous, clothed with dark brown bark. *leaves* mostly confined to the apex of the ultimate branches, three or four inches long, of a remarkably neat appearance, almost exactly elliptical, coriaceous, full green, very even, most indistinctly nerved, glabrous above, as is the somewhat wrinkled *petiole*, the base cordate, the margins recurved, the apex suddenly acute, the underside Dale Amen very obsoletely nerved, and quite glabrous, except towards the costa, where it is dotted as it were with dark, ferruginous, pulverulent tomentam. *Flowers* large, handsome, six to eight in a capitate *raceme*. *Pedicels* less than an inch long? glabrous. *Braetem* deciduous, exterior ones glabrous, viscid, or sparingly downy. *Calyx* very short and small, the *lobes* triangular, rather obtuse, glabrous. *Corolla* lilac-colour; the *tube* campanulate, the *limb* spreading, of five nearly equal rounded *lobes*, the upper one however the largest, all two-lobed, sprinkled with deeper rose-coloured dots within. *Stamens* ten, as long as the tube. *Filaments* white. *Anthers* purple-brown. *Style* filiform, longer than the stamens. *Ovary* fflabmn oblong-ovate, five-lobed, five-celled.

A very distinct and handsome species, worthy to bear the name of one who may justly be called "Botaniooram Indicorum facile princeps." Its leaves are quite unlike any Indian species, and the flowers in colour and size resemble those of the much cultivated *R PonUcm*.

TAB. V. *Rhododendron FalKekiL* Fig. 1. Stamen. 2. Calyx and pistil. 3. Calyx and section of the ovary:- ~~magnified.~~

V



FORM. FORBES

RHODODENDRON CAMPBELLII, Hook. fil.

lan. Forbes, & Eastw. del.

## 5.

RHODODENDRON CAMPBELLS, *n*\**Mrs. Campbell's Rhododendron.*

TAJ\*. VI.

Arborruin, foliis coriaceis oblongo-lanccolatis acumiatis basi cordatis supra glaberrimis subtus rufo- v. ferrugineo- tomentos marginibus rerurvis, pctiolis pedunculis calyceque furfuracis, capitulis densifloris, calycis parvi lobis brevissimis, corolla; puniceaj intus nnculatre lobis 4 rotundatis integris unico (superiore) bilobo, staminibus 10, ovario puhescnte 7-10 loculnri.

HAB. Sikkim-Himalaya, frequent: alt. 9,000-10,000 feet. FL April and May.

This may be called a *tree*, attaining, as it does not unfrequently, a height of forty feet, detected in various localities, at the elevation just mentioned above the level of the sea. On the summit of Tonglo it is the prevailing plant, and there, when in full flower, it exhibits a truly magnificent spectacle, gorgeous with scarlet heads of blossoms. So far as I could observe, the greater the elevation above the sea at which this species grows, the redder or more deeply ferruginous was the under-side of the leaf. This ferruginous tomentum, together with the obtuse and cordate base of the leaf, are the characters which distinguish it from *R. arboreum*, as the very different outline of the leaves docs from *R. Nilat/irimm*. *It. vinnamomemn*, Wall. (*R. arboreum*, var., of Lindley and DeCandolle) differs in the white (perhaps not the norml) colour of the flowers, and in the two-lobed segments of all the lobes of the corolla. In the present species the peduncles, stylos, und base of the filaments are red.

TAB. VI. *Rhododendron Campbelluc*. Fig. 1. Calyx and pistil. 2. Section of ovary. 3. Ninnun *i—wagrijfief*.

## 6.

RHODODENDRON ARBOREUM, *a*\**Scarlet arborescent Rhododendron.*

Subarborcum, foliis coriaceis lanccolatis subacuminatis basi in pctiolum attenuatis supra glabris subtus argenteis marginibus subrccurv, capitulis <msi-  
loris, bracteis sericeis, calycis parvi lobis brevissimis, corolla punicea fnum supra tuboque intus purpiroo-inaculatis, stninihus |o<sub>t</sub> nvrin m-riiro  
8-10-loculari.

RHODODENDRON arboreum. *Smith, Ex. Bot.* p. 9. t. 6. *tinil.* in *Bot. %.* t. N90. *Hook. A>. FL.* t. 1 (58. *lhn% FL Ny.* p. 154.

RHODODENDRON puniceum. *Box6.FI'Ind.* vol.ii. p.409.

BOORANS. "*Hardto. in Trans. Jriat. Soc.* vol. vi. p. 359."

HAB. Darjclng, and along the Himalaya, extending east, we believe, according to Mr. Griffith's notes, into Hootn, and west aH far as the valley of the Chenaub, in long. 77°. (*T. Thomson.*)

[We need not occupy our space with any description of this species. An excellent drawing of it, sent by Dr. ]looker :is a new species from Darjclng, proves to be the true *R. argenteum*, the first, indeed, of the Indian *RhtHlodemifma* that was discovered. Wo can refer with confidence to the synonyms above-quoted, which is more than can be said of many that bear this name. The figure in Knglidi Botany, however, does not exhibit the under-side of the leaf; and the purplish spots or dots are omitted by the Indian artist, from whose drawing the plate was copied. Dr.Lindle/s figure is very characteristic; but that by Dr. Orville, in the Exotic Flora, is ]mrtieidary liitlifid. The distinguishing marks of this species are the almost exactly lanceolate leaves, more or less Jieuminated, tapering at the base into the footstalk, and clothed beneath with a compact silvery film, neither to be called silvery nor downy. Ka]





J.P.M. Forst.

RHODODENDRON ROTLI, Hook. fil.

Herb. Dublin & Kew, Eng.

7.

## RHODODENDRON ROYLII, *Hook. fl.*

*Dr. Boyle's Rhododendron.*

TAB. VII.

---

**Arboreum** Molnscwiaceisem ^ **acuminatis** margine wvolutis baai obtusia subcordatis supra glaberrimis nitidia sabtoa oehncectiaeu polrenikntia, petiolia transvev̄m rugoais, capitulis 6-8-floris, lobia (pednncnliBqoe reanoeo-glanduloeiB) bmanmis rotundatif, corolla intufflined\* segmentis rotondatia wmtis, rtainiiubnB 10, o ^ puberoK 1 « ^ 5.

HAB. Sikkim-Hmialaya; momrtaJM <f the interior. FL April and May.

---

This and the following species (*X. etnnabarimm*) betaig to a group distinguished by the **small size of the plants, the brownish-red cobur of the corolla, and its nearly equal and sharp segments.** As species they are all easily recognised. The present is a *tirub*, with almost exactly oval or elliptical leaves, clothed Deneath with an **whraceous-brown pulverulent substance.** *Petioles* obscurely winged. *Flowers* in a *lax head*, from four or five to eight. *Corolla* suboniaeuous, small, with campanulate tube, striated within, limb not much spreading, the five looes rounded, but comkg to ^ **acute point, the pointe tipped with bluish-green.** In its unexpanded state, the corolla is tinged with blue. *PeArnde.* slender, short, waited asitwere. Ji & ^ to slightly ciliated at the base. Owryshort. %fc and *sterna* green.

---

TAB. VII. *BiododeHdum BoyUL* Kg. 1. Stamen. 2. Calyx and pistil. 8. Section of ovary - **magnified.**

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TibW.



J. D. S. P. 1861.

RHODODENDRON SINABARINUM, Hook. fil.

Keppel, Seebach & Zorn, 1861.

## RHODODENDRON CINNABARINUM, B<sup>«\*</sup>.p.

*Cinnabar-leaved Rhododendron.*

### TAB. VIII.

Frutex, ramis giadlibos tortoosis, foliis ovato-lanceolatis acntis marginibns sabrevolatis bai in petiolum tuberculorum attenuatis dab,<sup>1</sup> copiose reiäcnlatim venosis snbtus pallidis rafisve squamuloso-punctatis, floriboa parvia capitata cinnabariniB, lobis calycini<sup>1</sup> lni<sup>1</sup> inequalibna pedunculaque groeße glanddoso-squamosis, corolla; infandibuliformis lobis onnibus rotodontis acutis, stammibus 10 filamentis basi pilosis, ovario 5iloculari furfuroceo.

HAB. Sub-Himalaya mountains, interior of Sikkim. Fl. April and May.

A small *shrub*. Leaves two to three inches long, an inch wide, slightly tapering at both extremities, glabrous, beautifully and closely reticulated above, beneath often reddish, punctato-squamulose: the *costa* terminating in a short produced point. Petiole glabrous, wrinkled. Peduncles short, clothed, as is the calyx, with large, yellow, glandular scales. Calm cut to the base into five very unequal linear lobes or segments, of which the upper one is much the longest, and almost subulate. Corolla small, infundibulifonn, cinnabar-coloured, five-lobed, the lobes spreading, rounded, acute. Ooar\* oblong-ovate, glanduloso-squamose, five-celled. Stamens ten, included: filaments stout, hairy at the base. Style longer than the stamens, hairy below. Stigma capitate, five-lobed.

One of the most distinct of all the Indian Rhododendrons yet known, remarkable for its reticulated leaves and the singular colour and acute lobes of the corolla.

TAB. V m. *Mododndro\* dnnabariüm*. Fig. 1. Corolla. 8. Stamen. 8. Pistil and calyx. 4. Section of ovary, showing the On oelk;<sup>1</sup> magnified.

### 9.

## RHODODENDRON ELJEAGNOIDES, Haok.fi.

*Ouatter-leaved JUcdodendrou.*

Fruticulus ramoaisrimiia, ramia taberoulatia submtidllatia, Mia parria bnri-patiolatis late obmto-titpenideis utrinqna aquaria orbieuktis cleiwe fuifuraoaia, peduneolis aolitariis fructiferis eloigatis Ma quintuple mparantibua, oapnla oblongewsylandnoea 6-loculari 6-raIW baai wgnentu calydnü | brevioribus suffulta.

HAB. Mountains of Sikkim-Himalaya, at an elevation of 14-15,000 feet.

Fmtexparvulusignosnsvalderainosua; rainiatortisdivaricatM4^ uncius longis, cortice stro-fusco tuberculato tectis. Folia 1 unciam bnga, ffignikta, coriacea, pkna, obovato-trapewidea, costa valida perenna, obtnsa, basi in petiolum bnvem angustata, utrinque squamulosis inmmtisargenteo-fufunnwirtinJtovw. Pethmeutofructifernannoaia, eapsnlaerecta, 2lineaslonga.

A good many specimens of this plant wew brought to me by mycolleotors from (he neighbourhood of the snow in April, growing at about the elevation above stated; but none in flower. A ffgore of it is therefore omitted; md its snuW\* oamiot of «rai\* be awsertained.



RHODODENDRON ARGENTEUM, *ma.ja.**Silvery Rhododendron,*

TAB. IX.

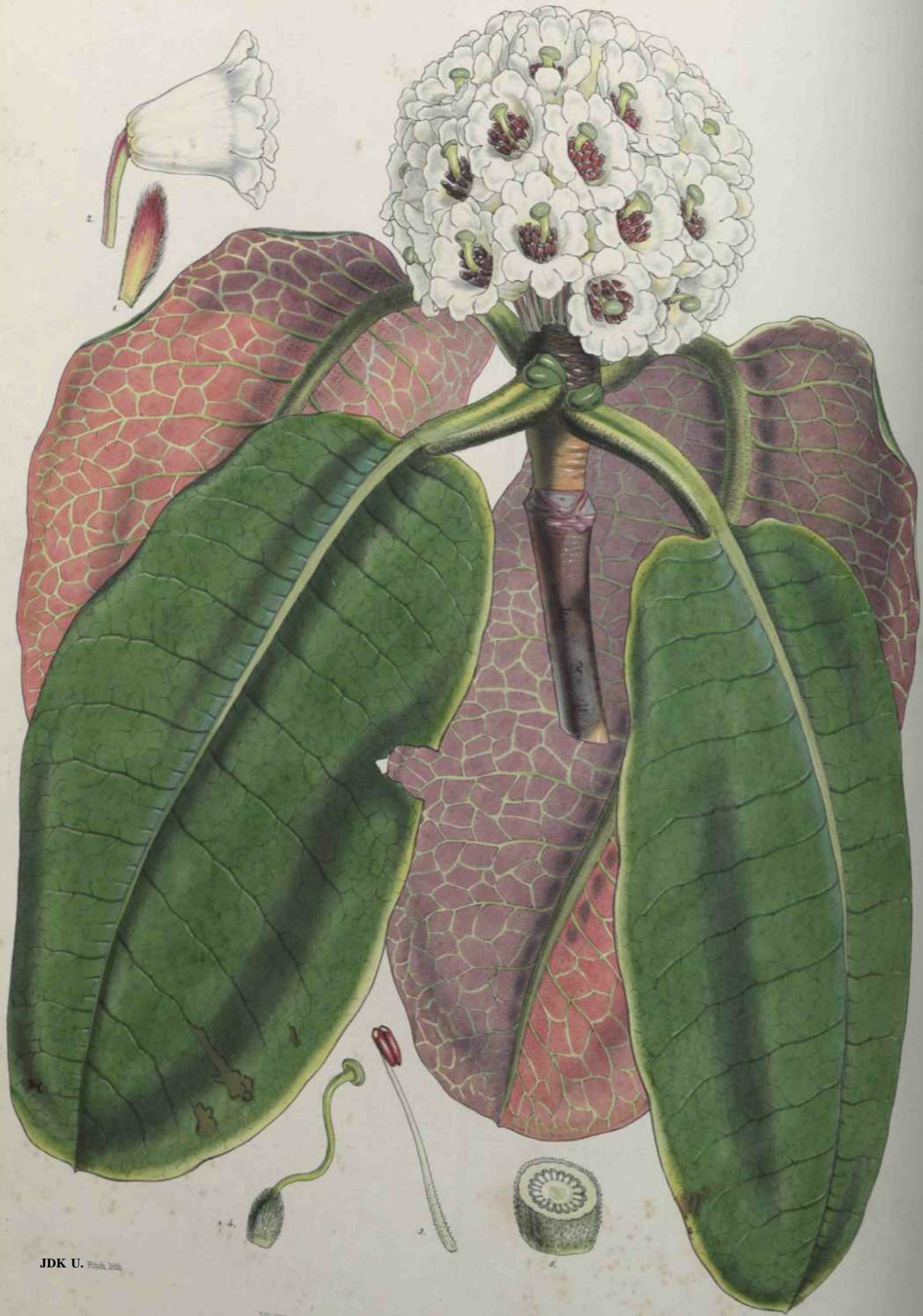
Arboreum, fbKisamplissubeoriae eisob<sup>^</sup> blongis acutis in petiolum crassum attenuatis planis utrisque glaberrimis calicis argenteis costa nervisque prominens, imbricatis dense <sup>></sup> pedunculis brevibus crassis puberulis, calyce haerensimmo obscure lobato, corolla (inter marinas) alba late campanulata, limbi segmentis brevibus bilobis, staminibus 10, filamentis glabris ovarii pubescentis loculis subdecem, stylo flexuoso crasso, stigmate dilatato.

HAB. Sikkim-Himalaya; summit of Sinchal, Suiadah, and Tongto. elev. 8,000-10,000 feet. **Fl. April.**

A tree thirty feet high: trunk solitary, or two or three together, spreading, branched above, the bark pale, the branches leafy at the apex, leaves very beautiful in the leaf-buds, erect and dark, at first enveloped in large scales, broadly closely imbricated and so large, as to resemble the cones of some species of pine, the outer or lower scales broad and coriaceous, glabrous, coloured (reddish-brown) the innermost one. oblong-ovate, pubescent. When fully developed the leaves are among the largest of the genus, six inches to a foot long to five inches broad coriaceous, nearly plane, glabrous, full green above with parallel rather closely placed nerves, beneath silvery white, with the cost, and nerve, prominent. Petioles deciduous, densely silky. Branches two to three inches long, two to two and a half inches in diameter, always white.

In the silvery underside of the foliage, but in nothing else, that resembles *R. arboreum*; while in the much divided limb of the corolla, the tendril of the ovary, the stout flexuose style and large stigma, it approaches *R. imbricatum*, but only in those particulars. The blossoms are only second in site to *B. Dalhousii*. On Sinchal, the higher part, of the mountain, at from 8000 to 9,000 feet of elevation, are more or less clothed with it: on Tongto, at about 10,000, it is suddenly replaced by the following species, *Mcaneri*. It seems to be shy of flowering, this season at least (1848); for it was with difficulty I could procure sufficient specimens to complete my drawing.

TAB. IX. *Rhododendron argenteum.* Fig. 1. Stamen. 2. Pistil. 3. Section of ovary: - w ^ d A



JDK U. Fish. Lith.

RHODODENDRON

From Johnston & Eaton 1892

## RHODODENDRON FALCONERI, *Hook. fl.*

*Dr. Falconer's Rhododendron.*

T A B . X .

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Arboreum, folia amplis valde coriaceis obovato-ellipticis obtusis cum mucronulo basi cordatis supra nitidis glabris reticulatis venis lubris ferrugineis costa petiolisque validis rufo-tomentoso-furfuraceis, capitulis globosis densis multifloris, pedunculis enotis pubescenti-viscosis, floribus parvis (pro planta) albis, calyce minutissimo vix lobato, corollae lobis 10 rotatis, staminibus 16, ovario binatis uno viscoso 18-loculari, stylo flexuoso incremento longe exserto, stigmate dilatato.

U.A.B. Sikkim-Himalaya. Summit of Tonglo, elev. 10,000 feet.

---

A tree thirty feet in height; two or three trunks springing from the same point, and they are often two feet in diameter. The bark is pale and smooth: branch\* few, spreading, leafy at the points; the young leaves clothed with velvety down, and in the state of the bud concealed by downy glutinous scales, of which the outer are subulate, the inner ovate. The perfect leaves are very coriaceous, from eight inches to a foot in length, five to seven inches wide, the upper side glossy green, but fading into yellow at the margins, which margins are quite plane (not recurved), beneath, except on the mid-rib and reticulated veins, clothed with a short, dense, pale, ferruginous down. Petioles long and very thick, plane and glabrous above, semiterete and clothed with dark rusty down beneath. Head\* not large, but composed of numerous, rather small, white, densely placed flowers. Stamens sixteen. Style much exserted. Peduncles erect, elongated after flowering. Capsule, erect, eight to ten-valved, hispid, an inch and a half long, with numerous cells.

If not the most showy, this is certainly one of the most striking and distinct of the genus. The noble foliage has some resemblance to that of the variety of *Magnolia grandiflora*, which has the leaves ferruginous beneath. The dense many-flowered head, the multiplication of the lobes of the corolla, and of the stamens and cells of the fruit, and the exserted style, bring it very near *Blonde*, Wight's Ic. Plant., vol. iv. tab. 1202; but the foliage is totally different.

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TAB. X. *Rhododendron Falconeri*. Kg. 1. Bractad «le. 2. Flower. 3. Stamen. 4. Pistil. 5. Section of ovary :—*magnified*.



THE  
RHODODENDRONS

OF

SIKKIM-HIMALAYA;

WITH

AN ACCOUNT, BOTANICAL AND GEOGRAPHICAL, OF THE  
RHODODENDRONS RECENTLY DISCOVERED IN THE MOUNTAINS OF EASTERN HIMALAYA,

FROM

DRAWINGS AND DESCRIPTIONS MADE (\* THE SPOT,

DURING A GOVERNMENT BOTANICAL MISSION TO THAT COUNTRY;

BY

JOSEPH DALTON HOOKER, R.N., M.D., F.R.S., F.L.S.,

*fr. fr. fr.*

EDITED BY

SIR W. J. HOOKER, K.H., D.C.L., F.R.S., F.L.S., &c.

Vice-President of the *Unam Societate*, and Director of the Royal Garden of Knr.

PART XL



LONDON:

REEVE AND BENHAM, HENRIETTA STREET, COVENT GARDEN.

1851.

## PREFACE.

IN the few remarks it seemed necessary to offer as introductory to the "Fasciculus of the Rhododendrons of Sikkim-Himalaya," we made the statement that the author of that work, during a limited sojourn in the country and under many difficulties and privations, had been able to detect there no less than eleven different species of *Mododendrum*, of which nine were considered new. A longer sojourn in the country, and more extended travels, and excursions to the more elevated regions of this vast mountain-chain, on the part of Dr. Hooker, have now brought to light no less than forty-three species, natives of Sikkim-Himalaya! many of which even exceed, in the size and beauty of their flowers or their foliage, the handsomest of those which had been previously discovered. Seeds, too, of a large proportion of these, have been sent to the Royal Gardens of Kew, and have arrived in so good a state, that we have been eminently successful in rearing them. Of all, accurate descriptions were drawn up on the spot; a great number of drawings were made, and Messrs. Reeve and Benham have readily acceded to the wish of the author to publish two more Fasciculi, each of ten plates;—the plates executed with the same degree of skill and care, and coloured with the same fidelity to nature, as the preceding ones.

Not content with drawing and describing the species that fell under his own observation in India, Dr. Hooker has occupied himself with the history of the species, known to inhabit the Himalayas, and in the present part of the work we find forty-three species, arranged in eight groups or divisions. This Conspectus we give in the present part of the work, and by which it will be seen what species are to appear in the third and last Fasciculus.

THE  
RHODODENDRONS  
OF  
SIKKIM'HIMALAYA.

CONSPECTUS SPECIERUM INDLE ORIENTALIS.

1. *Calyx obsolete. Corolla broadly campanniate, hemispherical at the base. Siameiu 18-20 (rarefy 10). Ovary usually fflanduhao-pubescent and villous, many (10-20) celled.—2Yee». Leaves ample. Mower\* white or pale purple, capitate, often crowded.*

1. *R. Fakoneri*, Hook. fil. TAB. X.

HAB. Sikkun-Himalaya; outer and inner ranges. Mountain-tops and valleys. Elev. 10-12,000 feet

*Note.* The natural size of the flowers of this species is often as great as that given for the magnified figure (fig. 2) in the plate quoted, in which case the capitula are fewer-flowered. Leaves often fifteen inches long and eight broad. Capsule densely villosa-tomentose, oblong-cylindrical, obtuse, slightly curved, an inch and a half long, half an inch wide. Seeds pale-brown.

2. *R. argenteum*, Hook. fil. TAB. IX.

HAB. Sikkim-Himalaya; inner and outer ranges. Elev. 8,000-10,000 feet It flowered very abundantly in April of 1849.

*Note.* Stamens generally eighteen in number. Capsules puberulous, oblong-cylindrical, obtuse at both ends, one and a half to two inches long. Seeds pale.

3. *R. Hodgymi*, Hook. fil. TAB. XV.

HAB. Sikkim-Himalaya. Elev. 10-12,000 feet.

4. *R. grande*, Wight, Icon. 1.1202.

HAB. Bhootan,

II. Calyx cupdar, hemispherical or mtelliform, obsoletdy loied. Corolla campanulate, Globed. Stamens 10-16. Ovary 6-16-ce/M—Largeflowering drubs. Leaves very glabrous.

5. R. AucMandii, Hook. fil. TAB. XL

IIAB. Sikkim-Himalaya. Elcv. 7-9,000 feet, rare.

6. R. Griffithii, Wight, Icon. 1.1203.

IIAB. Bhootan, Griffith.

7. R. nmmd, Hook. fil. TAD. XIT.

HAB. Sikkim-Himalaya. Elcv. 11-13,000 feet, abundant.

H. R. (Jantfr/aftrm, Hook. fil. TAB. XXIX.

HAB. Sikkim-Himalaya. Elcv. 11-13,000 feet.

m. a\*: mlyfohuaceons, 5-partite, tubes mubmembranaceous. Corolla infundibuliform or campanulate, tube elongated. Stamens 10-18. Ovary 5-6-celled.—Shrub; frequently Epiphytes. Flowers white. Leaves generally lepidote beneath.

!). R. Dalhonia, Hook. fil. TAB. I. II.

IIAB. Sikkim-Himalaya; outer and inner ranges. Elev. 0,000-9,000 feet. R May, June; fr. October.

Note. Gemma! terminal, Htrobiliform, one and a half to two inches long; scales broad-orbicular, concave, very comiceous, almost waxy, pale-tawny, glabrous, ciliated towards the margin with snuamuh. Petioles sometimes setose. JEZL? A...Ar-oblon\* -; \* — '\* curved, mutinous, 5-angled, punctato-glandulose, the valves back, the axis terminated by the persistent sty., J i 'A T \* " \* " ^ o b ^ Reled at the

10. R. Edgewarthii, Hook. fil. TAB. XXI.

HAB. Sikkim-Himalaya. Elcv. 7-9,000 feet.

11. R. Aarbatum, Wall., Hook. fil. TAB. III.

HAB. (Jossaiug-Than, Nepal, Wallich. Sikkim-Himalaya, Onsdursrfm 11,000 feet, 11,000 feet. <Vmd mountains, and in valleys. Elev. 9,000- Note, jwancncs, puuncncs, ana calyca gnuvnu. Leaves beneath to generally glandulose, rarely quite glabrous, glands stimate. \* " > \* > \* > \* the degree of hairiness, but otherwise a well-marked species.

12. R. iHitcifolium, Hook. fil. TAB. IV.

IIAB. Sikkim-Himalaya. Elev. 8-10,000 feet.

Note. Probably only a glabrous small-flowcred and small-leaved variety of R. barbatum.

13. R. ciliaum, Hook. fil. (n. sp.) TAB. XXIV.

HAB. Sikkim-Himalaya. Uchen and lachoong valleys. Elev. 9-10,000 feet.

14. R. ^H«IH»; Hook. fil. TAB. XVII.

HAB. Sikkim-Himalaya. Chola, Lachen, and Lachoong passes. Elev. 10-12,000 feet.

15. *R. vacdnioides*, Hook. fil. (n. sp.); fruticulus laxe vage ramosus, caulibus ramisque gradh'bus tuberculatis nltimis petiolis pedunculis foliisque subtus sparse squamulosis, foliis coriaceis obovatis obtusis emarginatisve superne glaberrimis\* subter palh'dioribus, pediceUis subterminalibus solitariis gracilibus, lobis calycinis ovatis obtusis, capsula parva gracili curvata 5-loculari, valvis submembranaceis.

HAB. Sikkim-Himalaya; epiphytal, or growing on moist rocks, in very damp places, on the inner and outer ranges. Alt. 6-8,000 feet. *M.?*

A small, very slender, straggling species, sometimes pendulous from trunks of trees, and then two feet long, of a bright green colour, and so like a common Sikkim species of *Faccinium* (*F. obovatum*, Wight, Icon. 1.1103) as not to be distinguishable at first sight.

*Stem* no thicker than a dove's quill, scabrid with tubercles, indicating the former position of scales, which still clothe the ramuli, petioles, and, more sparingly, the under surface of the foliage. *leaves* coriaceous, three-fourths to one inch long, obovate or even spatulate, the lamina produced downwards to the very base of the petiole, upper surface a bright green, lower paler. *Peduncles* of the fruit as long as the leaves, slender. *Calyx* small, but manifestly foliaceous. *Capsules* curving, narrow, pale-coloured, and membranous, an inch long, scarce one-eighth of an inch in diameter, valves linear, torulose, a little scaly on the back. *Seeds* pale-coloured.

**I have never found the flowers of this singular and very distinct little species.**

16. *R. ~~parviflorum~~*, Hook. fil. TAB. XIV.

HAB. Sikkim-Himalaya, Zemu and T'hlonok rivers, rare. Elev. 12-14,000 feet.

IV. *Calyx* small or obsolete, rarely 5-toothed, lobes equal. *Corolla* campanulate, or with the limb contracted below its base, and subin/undibuHJbrm. *Stamens* 10. *Ovary* 5-10-ceUed.—*Shrubs, generally glabrous or clothed beneath, sometimes lepidote.*

17. *R. arboreum*, 8m. *Bxot. flora*, t. 6. (supra p. 0), not Wight,  *Ic.* 1.1201.

HAB. Himalaya Mountains: from Bhootan to the western extremity. Elev. 6-8,000 feet.

18. *R. CampbeUia*, Hook. fil. TAB. VI. " *R. Nilagiricum*, *Hook. Sot. Mag.* t. 4381 (not Zenker).-<sup>^</sup>*ar. fi.* flora albo.

*R. arboreum*, album, *WaU. Ic. Ear. Ind. Or.* vol. ii. p. 23. 1.128 P

HAB. Sikkim-Himalaya; on both the outer and inner ranges, at elevations of from 7-10,—and even 11,000 feet.—*£.* Mountain of Sheopore in Nepal. *Dr. WaUieh.*

*Note.* It has been already stated that the chief difference between this and *B. arboreum* consisted in the rusty dull (unpolished) tomentum of the underside of the leaf of *B. CampbeUia*, as compared with the silvery compact filmy clothing of the latter. Dr. T. Thomson assures me that in Western Himalaya, where *B. arboreum* is so common, it is never otherwise than silvery and white beneath. Since I have seen the figure of *B. Nilagiricum* in the Botanical Magazine, Tab. 4881, I am quite disposed to consider the present species identical with that, exactly agreeing with that in the shape of the leaves, as well as in other characters, and since that is acknowledged to have differently-formed leaves from the true *B. Nilagiricum* of Zenker, and also said to be from Nepal, not from the Neelgherries, we can hardly doubt but that it may safely be brought as a synonym to our *B. CampbeUia*: perhaps, also, Dr. Wallich's *B. nobUe* (Wall. *Gat.* n. 1521, excluding 2) is not different, but this is nowhere accurately described, and possibly *B. cinnamomeum* (which by many is considered a variety of *B. arborem*) of the same author, from Nepal. I have not seen *B. CampbeUia* below 7,000 feet, whereas *B. arboreum, verum*, ranges from 5,000 to 8,000 feet.

19. *R. Nilagiricum*, Zenker, *Plant. NUag. cmlc.* (notHook. *Sot. Mag.* t.4381). *R. arboreum*, Wight,  *Ic.* 1.1201 (not8m.)

*R. nobile*, *WaU. Cat.* n. 1521. 2 (not 1).

HAB. Nedgherry hills, abundant. Wight, Zenker, and others.

*Note.* Difficult as it may be to define the characters of this species in words, yet we believe that no one can see our native specimens in the herbarium without feeling assured that it is a distinct species, and truly different from any found in the north of India. There is a peculiarity in the firm and hard texture of the broad foliage, with its strongly recurved margins, and the deeply impressed venation and opaque green colour and a still stronger distinguishing mark is in the almost globose strobilus, formed by the scales of the united flowers while in young bud, and which is admirably represented in Dr. Wight's plate above quoted. The nearest approach to this is in the *Rhododendron* from Adam's Peak and other mountains of Ceylon, which, I believe, has never been described, though it has been considered, while there was believed to be only one *tree* *Rhododendron* in India, as *B. arboreum*, and it is cultivated in nurseries under the name of *B. Zeylanicum*. This has darker foliage than *B. Magiricum*, and is much larger in all its parts.

20. *R. nobUe*, Wall. *Cat.* n. 1521 (not 2, which is *B. Ntlagiricum*).

HAB. Kamaon. *Dr. WaUich*.

21. *R. niveum*, Hook. fil.; arbuscula vage ramosa, cortice fusco rugoso, ramulis pubescentibus, foliis obovato-lanceolatis breve petiolatis obtusis v. subacutis super glaberrimis opacis subter petioloque tomento appresso niveo (rarius fuscescente) lanatis; capitulis densissimis, pedicellis brevibus, calyce obsolete, capsulis oblongo-cyphdraceis tomentosus utrinque obtusis 6-ocularibus, valvis lignosis, seminibus pallidis.

HAB. Sikkim-Himalaya; rocky valleys and ridges, Lachen, Lachoong, and Chola; elev. 10-12,000 feet, not unfrequent. HP Jh November.

A small rugged-barked tree, having the habit and general appearance of *B. arboreum*, with which and *B. CampbeUia* it grows frequently intermixed, but may be distinguished, even at a distance, by the snow-white under-surface of the leaf. On a closer inspection this is seen to be caused by an appressed flocculent tomentum, occupying both surfaces of the very young leaf, and sometimes of a rusty-red hue. In the two quoted allies the leaf is narrower and the whitish hue or silvery lustre of the under-surface of the leaf is not removable, and is generally shining. The upper surface of the leaf of this is opaque, but in *B. CampbeUia*, polished. *Capsules* of this shorter, more cylindrical, blunt, and straight. I have never-known these species to pass into one another. The present inhabits a much higher elevation than that usually occupied by *B. arboreum*. The flowers I have never seen.

22. *Rfomostm*, Wall., *PI. Asiat. Bar.* vol. iii. p. 207. *Hook. Bot. Mag.* t. 4457. *R. Gibsoni*, *Hortulan*.

HAB. Mountains bordering on Silhet. *Dr. WaUich*, *Mr. Gr^h*, and *Mr. Gibson*.

23. *B. campanulatum*, *Tan*, *Wem. Trans.* vol. iii. p. 409. *Watt. Cat.* n. 756. *Hook. Bot. Mag.* 1. 1944.

HAB. Gossaing-Than in Nepal; and Kamaon. *WaUich*, *Hamilton*.

24. *R. WaUiehU*, Hook. fil. TAB. V.

HAB. Sikkim-Himalaya; on spurs and in valleys of the inner and outer ranges; elev. 11-18,000 feet. *M. June*; *Jr.* October.

*Note.* Distinguished from *B. campanulatum* by the conspicuous calyx. Leaves ferruginous or olivaceous beneath, pubescent or villous. Capsules linear, slightly curved, nearly erect, woody, glabrous, an inch to an inch and a half long. **Seeds pale.**

25. *R. Wightii*, Hook. fil. TAB. XXVII.

HAB. Sikkim-Himalaya. Elev. 12-14,000 feet.

26. *R. lanafm*, Hook. fil. TAB. XVI.

HAB. Sikkim-Himalaya, at Jongri and Ghola. Elev. 10-12,000 feet.

27. *R. K/vlyens*, Hook. fil. TAB. XXV.

HAB. Sikkim-Himalaya. Elev. 12-14,000 feet.

28. *R. aruyinosum*, Hook. fil. TAB. XXII.

HAB. Sikkim-Himalaya. Elev. 12-14,000 feet.

29. *R. campylocarpum*, Hook. fil. TAB. XXX.

HAB. Sikkim-Himalaya. Elev. 11-14,000 feet.

V. *Calyx short, coriaceous, 5-lobed or 6-dentate, lobes short, one (the upper) generally elongated, sometimes subulate. Corolla finely 5-lobed, tube narrowed, lobes rounded or acute. Stamens 10-20. Ovary 6-10-celled.—Shrubs. Leaves lepidote beneath. Flowers closely capitate.*

30. *R. Maddeni*, Hook. fil. TAB. XVIII.

HAB. Sikkim-Himalaya. Lachen and Lachong valleys, very rare. Elev. 0,000 feet.

31. *R. dinnabanhum*, Hook. fil. TAB. VIII.

HAB. Sikkim-Himalaya; chiefly in valleys and on the skirts of woods, elev. 10-12,000 feet, abundant. E. Jane; Jt. November.

*Note.* Shrub six feet high, very elegant; branches and branchlets virgate. Corymb spreading. Peduncles half an inch long. Flowers pendent. Capsules small, half an inch long, ovate, obtuse.—One of the most elegant species of the genus, but very inefficiently represented at our Tab. VIII. Its pendulous or drooping flowers, when in perfection, are peculiarly graceful. It is universally considered poisonous to cattle and goats: of the latter I have seen many die, from eating either of *Una* or of a species of *Andromeda*;—the latter is notorious for this property throughout Sikkim, Nepal, and N. W. Himalaya. If employed for fuel, the smoke of *R. dinnabanhum* causes the eyes to inflame and the cheeks to swell.

32. *R. Boyki*, Hook. fil. TAB. VII.

HAB. Sikkim-Himalaya. Elev. 10-11,000 feet.

*Note.* Very near, it must be confessed, to *B. chinabaricum*.

VI. *Calyx subglobose, 5-lobed, lobes coriaceous or membranaceous. Tube of the corolla short, tinged at the base, the lobes patent, concave. Stamens 8-10. Style subobovate, short, deformed, valid. Stigma thickened, disciform. Ovary 5-lobed, often sessile, epiphytic or terrestrial. Leaves free in R. pendulum) deciduous.*

33. *R. complanatum*, Hook. fil. TAB. XXVIII.

HAB. Sikkim-Himalaya; generally pendent from the trunks of trees, sometimes rocks. Elev. 9-11,000 feet

34. *R. peMtm*, Hook. fil. TAB. XIII.

HAB. Sikkim-Himalaya; pendulous from trees, generally, rarely from rocks. Elcv. 9-11,000 feet.

35. *R. obovatum*, Hook. fil.; frutex ramosus, ramis ramulisque gracilibus, ramulis pedunculis calyce corolla cxtus pctiolis folisque subtus (junioribus utrinque) sparse squamuloso-ferrugineis, foliis petiolatis obovatis basi in petiolum angustatis apice rotundatis apiculatis vix coriaccis marginibus planis superne opacis subtus pallide ochraceo-brunnis, pedunculis brevibus (fructiferis clongatis) terminalibus solitariis, calycis lobis foliaccis obtusis, corolla rubro-purpurea (ut in *B. lepidoto*), staminibus 8, filamentis basi sericco-villosis, ovario creberrime lepidoto, stylo brevi crasso, capsulis conico-ovatis abrupte truncatis 5-sulcatis 5-ocularibus, valvis lignosis lepidotis.

HAD. Sikkim-Himalaya; rocky places. Lachoong valley, 12,000 feet. *Fl.* June, and again partially in September; *fr.* November.

A small shrub, 3-4 feet high, much branched, and very resinous in odour. *Branches* as stout as a duck's quill, not tortuous, but much divided, the upper scabrid where once lepidote. *Leaves* plane, membranous for the genus, of an opaque green above and pale yellow-brown below, the *costa* slender, percurrent; lamina an inch and a half long, half to three-quarters of an inch broad. *Buds* nearly globular; scales orbicular, coriaceous, brown, downy on the outer surface, ciliated, the outer ones lepidote. *Pedicels* half to three-quarters of an inch long, one to one and a half inch when in fruit, very lepidote, as is the calyx, base of the corolla, and ovarium, and fruit. *Corolla* altogether like that of *B. lepidotum*. *Capsules* one-fourth to one-third of an inch long, about twice the length of the persistent calyx-lobes.

The form and size of the foliage, and its glabrous upper surface, distinguish this well from *B. lepidotum*.

[There is no original drawing of this species.—*M*]

30. *R. sflignum*, Hook. fil. TAB. XXIII. A.

HAB. Sikkim-Himalaya; above Choongtam. Elev. 7,000 feet.

37. *R. elaagnoides*, Hook. fil. (supra Ifosc. I. p. 8. n. 9). TAB. XXIII. B.

HAB. Sikkim-Himalaya; open rocky places. Elcv. 12-16,000 feet.

38. *R. lepidotum*, Wall., *Cat.*: n. 738. *Boyle, III.* p. 260. t. (\$4. f. 1.

HAB. High mountains, Nepal, *Dr. WaUich, Dr. Boyle.* Sikkim-Himalaya, elev. 12-15,000 feet, *J. D. H.*

*Note.* A small densely-tufted shrub, a foot or so high, allied to *B. elaagnoides* and *B. obovatum*, with the flowers always on very short petioles. Its common name is "*Ikaluma*," or "*Tsuma*," amongst the Bhotas, and its resinous odour is very strong, not unpleasant. The description in De CandoDe (*Prodr.* v. 7. p. 724), if, as I do not doubt, it refers to this plant, is very erroneous. The leaves cannot be called "ferruginous below," in the same sense as applied to *B. anihopogon*, &c; nor are there any seta) or cilia at the bases of the leaves; nor have I observed more than eight stamens, the typical number in this very distinct group, which includes *R. salignum*, *B. obovatum*, and *B. elaagnoides*. The flowers vary from very fine red to a dingy yellow.

VII. *Calyx subfoliaceous, h-fartite or h4obed, lobes short, rounded. Me of the corolla short, funnel-shaped, lobes of the Kmb elongated, narrow, spreading, entire. Stamens 8, ewserted: filaments elongated, slender. Style slender, much ewserted. Ovary b-celkd.—lepidote shrubs.*

39. *R. triflorum*, Hook. fil. TAB. XIX.

HAB. Sikkim-Himalaya. Elev. 7-9,000 feet; scarce.



40. *R. viyatm*, Hook. fil. TAB. XXVI. A.

HAB. Sikkim-Himalaya; skirts of Pine-forests. Elev. 8-0,000 feet.

41. *R. nivak*, Hook. fil. TAB. XXVI. B.

HAB. Sikkim-Himalaya; on the loftiest bare slopes on the Thibetan frontier. Elev. 16-18,000 feet.

42. *R. setosm*, Hook. fil. TAB. XX.

HAB. Sikkim-Himalaya; open stony and rocky places. Elev. 18-16,000 feet.

VIII. *Calyx h-phyUout, lobes tnembranaeeous. Corolla typonraterifom, tube narrow, cylindrical, limb plane, patent. Stamens 6-8, included. Style short, donate. Ovary b-celled.—Small lepidote shrubs.*

48. *R. anthopogon*, Don, *Trans. Warn. Soc.* vol. iii. p. 409. *Hook. Bot. Mag.* t. 8947. *R. aromaticum*, *WaU. Cat.* n. 1520.

HAB. Gossaing-Tham, Nepal, and Kamaon, *WaUick, Hamilton*; Sikkim-Himalaya: rocky, open, especially gravelly places, abundant. Elev. 12-16,000 feet.

*Note.* A strongly and far more disagreeably and heavily odorous plant than *B. setosm*. This, the *Pah* of the Bhotas, shares with the *TsaUv* (ft. *setosm*) the blame of exciting the headache and nausea attending ascents to the dreaded elevations of the Eastern Himalaya. In the Herbarium its permanent odour is more disagreeable than that of any of the genus. Nothing, however, can exceed the beauty of its flowers, whether we consider the exquisitely tender, membranaceous, translucent texture of the corolla, with its delicate nervation, or the rich blush of the first opening blossoms, which insensibly passes into snowy white, then faintly tinged with sulphur—all colours seen on one and the same plant.





RHODODENDRON THOMSONI, *Hook. fil.**Dr. Thomson's Rhododendron.*

## TAB. XII.

FratexramosiMim^corticepaUidepapyTaceo.foliis in ramos terminates coriacei glabBriimB'orWonlartwivrtM obtnrinmis amenltis bad' cordatis late virentibu. .abta. gbraoecoenifl,™ nargine .ubreeum, peiolo gaeffi, coipibiB plnritoda, prf^ ^ K. ^ - n . . . petiolorum, floriba, radiatim pateniibu. cemuhve, calyce ampb c^inoWeyatiiiformi W „\*«, i^qnaKta lob»to, l Z ^ « Z obtmrisimis, corolla intense amginea coriaceo-carnosa nitida, tnbo dcaigato^panditam; limbi lobu J6 patentvnhreenrii profimde emrginatifil snperioribnB intaB maculate, 0\*\*^ 10, 0,,™ ooniocHTKnaiac **no glaberrimo 6-10-lobulati, stylo gracili, 8%mate conico, oapeola calyce oylindnceo peni8teote f teeto.**

HAB. Sikkim-Himakya; inner and outer iange>; eky. 11-18,000 feet; abundant. B. June. ». November.

A^sktotenleetbJ^ .ormdampw.wdsfifh^fe^ **but then spare, and woody.** lower imncie, BUmt, a foot in diameter; upper slender, leafy at the extremities. *Leaves* two to three inches long, very broad, general/ wKcular-ovate, but sometimes almost exactly orbicular, much resembling those of *B. campylocanmm*, Hook, fll only that in the latter the petioles are often glandular, here never; the texture of the lives is coriaceous, but not very thick, the apex very blunt, tipped with a short mucro, the base robcordate, the colour pafe greim, **tolow subglaucescens, everywhere** ^quite glabrous. *Flovert* in a corymb of six to eight together from the apices of short branches among the leaves, on peduncles an inch or more long, which radiate, as it were, from a centre, spreading horizontally or curving downwards, *Cafy*\* large, between cylindrical and hemispherical, or deep cup\*haped, coloured red in the upper half, green below, the base intense for the reception of the peduncle, three-quarters of an inch long and as much wide, the mouth almost truncate but obscurely lobed. *CoroBa* remarkable for the almost unrivalled deep blood-red oolom-Mid g k ^ suriaoe of its flowers, yielding only to *Rfitym*, Hook, fll,—deeper coloured than that of *A arbor am-*, the *Me* elongated, often vertically compressed, two inches long; the *limb* large, much spreading, five-lobed, the *Met* emarginate u **pper** ones spotted. *Stamens* a little longer than the tube. /k™\*fc4abrous, wMte; <^ **rather large, deep brown.** *Ovary* conico^lmdrical, glabrous, furrowed, six- to eight-celled. *Capsule* rather short, straight, glaucous purple, about three-quarters of its length immersed in the persistent calyx.

The whole is perfectly inodorous. Much honey is secreted in the base of the owoU^ wMdi lias'the chanoterof not being poisonous, like what is yielded by *B. Ddkmia taA B. aryentem*. The two latter species are said to render wild honey, collected in spring (their flowering season), deleterious.

To this species I give the name of Dr. Thomas ThoinBon, surgeon, R E. I. C. 8., late ^ **the Tibetan Mission** son of the learned Professor of Chemistry of Glasgow Umvërsity, my earliest -friend and companion during my CoDege' life, and now my valued travelling companion in Eastern Himalaya.



RHODODENDRON PENDULUM, *Hook. ju.**Pendulous Rhododendron.*

## TAB. XIII.

Eruticulul epiphytes penduhn, caulibus graefflimu dichotome remans, ramufes peduneis petiofu bravibiu fbliflque subter 4jmnaribiu ntriiqiifi) tomeito Wvo law dei « « ti ^ ~~foliis elliptico-oblongis subacutis apiculatis convexis superne nitidis, pedunculis terminalibus~~ subbinia rarins axillaribua parvis, oalyce profunde B-lobo hirsute, >bis effipticb sabmembranacen aeqaalOnu, eorolke albs extos lepidote tubobrevissimo, limbo patente 6-lobo, bins equalibus sflbunduntis integris, staminibus 10, fihmentu (anno 2r-8 ban inter se coalitu) xeotis interne dflatis supra mediam dense berbafu, antheris magnis bboratis, ovario parro dwiniimne fabo-villoso» capsula brevi calyom peniBtentem vix soperante vfllosa ban lepidota.

HAB. Smn-Himalaya; pendnliou 'from the limba of taU Rue-trees {Jbi\* JtMianajuA Bnmomam); eler. 9-11,000 feet, rarely found upon rooks; often covered wiSa. *Utnea*.

*Stem* three to four feet long, sparingly but dichotomoualy branched, dra«<?A»Bcarody stouter than a erov/a quill: young shoots very vflous. *Leave*\* chiefly confined to the apices of the ultimate branches, on short *petiole*; spreading, between elliptical and oblong, acute or nearly so, and fiurther tipped with a short mucro, smooth (never lepidote) and shining above, the margins a little recurved, an inch and a half to two inches long, and about three-quarters of an inch broad, below H«n»>], clothed with fararinous tomentum. *Scabs* of the flower-buds coriaceous, the outer lepidote, the inner villous. Udlojrv vivvio\*\* UAH\*\* \*\*\*^\*^\*o »

*Pedundes* two or three from the apex of the young leafy branches, very short, but longer than the petioles, ferruginous ^ villous, bearing one or two linear *bradea*. *Fbwen* small. *Calyw* large in proportion to the site of the flower, deep r cut into five, (^membraiiaoeoustobes, lepidote below ^ *Corolla* pure white, about an inch in diiunet\*, extern ^ lepidote, tube very short, gradually expanding into the nearly equally five-lobed *limb*: *Kbee* rotundato, waved at the margin entire. *Stamens* ten: *flame*\*\* straight, sometimes more or less combined at the base, and there dilated; below fht middle is a dense mass of white hairs; a<rf1 ^ laige:m proportion to the flower. *Ovary* ovate, densely villous, kpidofa towards the base. *Style* very short curved upwards, and thickened beneath the «%\*a, which is a ronvex, scarcely lob< disc. ft3»<fe broadly ovate, acute, hairy, four to five Imes long, fiv^oelled, five-valved.

This species is inodorous, very distinct, but clearly allied to *B. cameUul/orun*, Hook. AL, the lepidote character of that species giving place to a denser fulvous or ferruginous tomentum here. In the rise and colour and regular lobes of the corolla, and also in the general form of the calyx, the present may be compared with the *B. a>jft)rm\** of the Bock-Mountains of North America, but in Htle else. Growing, as it does, an epiphyte, upon the trunks of tree\* in the gloom; and almost impenetrable forests, it is a plant very difficult of detection.

• Hook. EL Bar. Am. vol iL p. 48. f. 188.

TAB. XIII. *Rhododendron pendulum*. Kg. 1. Hower. 2. Stamens. 8. PutiL 4. Ihnsvene section of ovary: - ~ y ^ f. 5. G\*sue with its persistent calyx: - « \* » < / < » •



## RHODODENDRON PUMILUM, *Hook. fil.*

*Dwarf Rhododendron.*

TAB. XIV.

Fratriculis humilia laze nmoaia, lamnia fblia ratter petiolia pedunoolia calydbua ovariflque lepidotia, folia pervis bnvUpetioliatia lato-  
effipticboriaedBapiciilatiBBup^ **glaberrimis subtus precipos glaucis, pedunculis** anitaria 2-8-nia elongate enetia strict\*, flow  
indinato, calycifl lotia ovatia obtusis, corolla roses campuulato extua pobeaeentia tnbo elongate, limbi lobu fanribna rotundatu  
integria/atainiiiiibiiB 10 indnaa, filameniaa rectia baai hifpidia, stylo zectiaacno, atigmate capiteto, capeula in pechmeulnm magia  
**elongatum erecta ovata 5-loculari calycem** partrifitentem multoties aapennto.

**HAB.** Sikkim-Hiinilaya; oil dpineBbpeaincmg e r i c a s **vegetation, rare; about the Zemu and Thlokak rivers. M. June.**

The smallest of all the Sikkim Bhododendrons: its slender woody *Hem* roots among moss, *Andromeda/astyiata*, &c.,  
ascends obliquely, and bears a few somewhat spreading dichotomous branches, three to finir inches in **length, rising above**  
the surrounding vegetation. *Leaven* chiefly from the upper ends of the branches, half to three-quarters of an inch long,  
broadly elliptical, rigid, mucronate, smooth and naked and bright bluish-green above, below lepidote, as is the short  
petiole, and glaucous. *Bract*, of the flower-buds coriaceous, smooth and downy, and, as is usual in the lepidote species,  
quite destitute of glands or squamute. *Pedmcle*, moderately slender, erect, one to three from the apex of \*e branches, and  
rising an inch and a half above the base of ihe superior leaves, firm and woody, much elongated^ and strict to the very apex,  
infruit ^ i n c l i n e d or almost drooping. *CaJ*\*\*\*\*\* ratiier short, but somewhat l\*fy in texture, reddiah-brown.  
scaly particularly towards lfce base. *CoroBa* half to three^quarters of an inch long, w s e ^ u r , campanukte, very delicate,  
externally all over down, and obscurely glandular • the ift\* rather broad, the \*\* of five, nearly equal, moderately  
spreading roundish^, which are quite entire. *Stamens* ten, included • *jUame*\* nearly slight, hispid at the base.  
*Ovary* ovate densely lepidote, five^led. %\* rafter short, thickened upwards. *M\*m* capitate, obscurely fiveJobed.  
**Capoule perfectly erect on the elongated strict peduncle, three-quarters of an inch long, w s e ^ u r , campanukte, very delicate,**  
ovate, red-brown, five-valved.

**it among the Sikkim-Himalayan Rhododendrons, it is an extremely elegant species, and**  
**rance: for I have never gathered it but twice, and each time in the wild district above indicated,**  
**soon after the snow has melted: and then its pretty pink bells are seen peeping**  
**above the surrounding short heath-like vegetation, reminding the botanist of those of *Limon borealis*.**  
**B ^elds a faint and agreeable odour, like that of *R. glaucum*, to which this has many points of resemblance.**

TAB. XIV. *Biotdbmxbm jmmbm.* Bg-1- ^PP" .  
\*w K. 1 Upper side of a leaf 8. Under ride. 3. Hower. 4. Stamen. 5. Oalyx and pistil.  
6. **Transverse section of ovary: —magnified.**





## RHODODENDRON HODGSONI, IJM. #1.

*Mr. Hodgson's Rhododendron.*

## TAB. XV.

Arborescens, ramis lanibus, foliis amplis petiolatis (petiolis crassis) obovato-ellipticis obtusis basi subcordatis curvatis glaberrimis marginibus recurvis luteo viridibus subtus tomento appresso subargenteo albido-glauciscentibus, capitulis magnis 15-30-locis, pedunculis brevibus tomentosis, calyce obsolete, cordate lobato (basi intruso) late campanulato, limbo brevi 8-lobato, lobis rotundatis sequalibus emarginatis, staminibus sub-18, filamentis gracilibus glabris, ovario pubescente viscido dense vestito 16-loculari, stylo elongato, stigmate disciformi radiatim lobato, capsulis anguste cylindricis longatis curvatis obtusis tomentosis.

HAB. Sikkim-Himalaya; on rocky spurs, and in the valleys of the outer and inner ranges; elev. 10-12,000 feet, very abundant. M. May and June; fr. December.

A small tree, from twelve feet, the average height, to twenty, branching from the base, main branches as thick as the human thigh, spreading horizontally for twenty or thirty feet each way, interwoven with the adjacent plants and shrubs. Bark smooth, papery, pale-flesh coloured, flaking off in broad membranous patches. Wood white, very close-grained, soft, yet tough, neither warping nor splitting, but, in consequence of the great compression of the larger branches, rarely affording a square a foot in the square. Leaf-buds or gemma terminal, as large as a hazel-nut; their scales broadly ovate, concave, coriaceous, subtomentose, tapering into a long acuminate point. Leaves terminal on the ultimate branches, ample, spreading, twelve to sixteen and often eighteen inches in length, varying in form, oblong-elliptical or obovate or ovate-lanceolate, obtuse, nearly cordate at the base, of a singularly thick coriaceous texture, quite glabrous and bright glossy green above, pinninerved (scarcely reticulated), the margins recurved; beneath, all, except the thickened costa, clothed with a pale silvery white, rarely ferruginous, closely appressed tomentum, but which is easily abraded by the finger, and is often itself evanescent. Petioles one to two inches or more long, very stout. Capitula four to six inches in diameter, of several delicate, pale purple or rose-coloured flowers. Peduncles short, viscid, often downy. Calyx obsolete. Corolla large, the tube an inch and a half long, broadly campanulate, the base depressed at the insertion upon the peduncle, the margin of the depression lobed, limb spreading, two to two and a half inches across, eight-lobed, the lobes rather short, emarginate, or obtusely bifid, reflexed. Stamens sixteen to eighteen, spreading; anthers slender, glabrous; anthers rather small, dark purple-brown. Ovary oblong-ovate, densely covered with a short, white, viscid tomentum, many-celled. Style rather short, glabrous, thickened upwards. Stigma a broad radiately-lobed disc. Capsules slightly curved, two inches long, cylindrical, striated, covered with a white loose tomentum. Seeds small, winged with a lax aril, jagged at both ends.

This and the *Abies Webbiana*, I have always regarded as the characteristic tree and shrub (or underwood) at the elevation of 10 to 12,000 feet in all the valleys of Sikkim. *B. Hodgsoni*, in this respect, ranks with the *B. arboreum* and *B. himalaicum*. In the Himalayas, the typical of a loftier zone of Rhododendrons, succeeded by the arctic one of *B. anthopogon*, *B. setosum*, *B. laurifolium*, and finally, for above the ordinary limit of phanerogamic vegetation, by *B. nivale*, which is found at an elevation of 18,000 feet above the level of the sea.

Nowhere can the traveller wander, in the limits assigned to the present species, without having his attention arrested by its magnificent foliage, larger than that of *B. Fakoneri*, and remarkable for its brilliant deep green hue. In summer

the leaves are broad, and spreading all round the plant; in winter rolled up, shrivelled, and pendulous from the tips of the branches. It is alike found at the bottom of the valleys, on the rocky spurs or slopes and ridges of the hills, in open places, or in the gloomy Pine-groves, often forming an impenetrable scrub, through which the explorer in vain seeks to force his way. Nor is this a thicket merely of twigs and foliage, that will fall under the knife or cutlass, but of thickset limbs and stout trunks, only to be severed with difficulty, on account of the toughness and unyielding nature of the wood.

The scentless blossoms expand late in April, and in May and June, but are not very copiously produced in comparison with the majority of its congeners.

Of the wood, cups, spoons, and ladles are made by the Hhotcas, and universally the little "Yak" saddle, by means of which the pack-loads are slung on the back of that animal. Easily worked, and not apt to split, it is admirably adapted for use in the parched and arid climate of Thibet. Nor is the foliage without its allotted use. The leaves are employed as platters, and serve for lining baskets for conveying the mashed pulp of *Arisama* root (a kind of Colocass); and the accustomed present of butter or curd is always made enclosed in this glossy foliage.

Such are the characteristics of this *Rhododendron*, which I desire to dedicate to my excellent friend and generous host, R II. Hodgson, Ksq., of Darjeeling, formerly the Hon. East India Company's Resident at the Court of Nepal; a gentleman whose researches in the physical geography, the natural history, especially the zoology, the ethnology, the literature of the people, &c. &c, of Eastern Himalaya, are beyond all praise.

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TAB. XV. *Jikotlenkudron HhotmiL* Fig. 1. *Vlo\p^i-^atm'al* size. 2. Stamen. 3. Pistil. 4. Section of ovary:—*magnified*. 5. Capsule:—*natural size*. 6. Seed with its aril. 7. Seed deprived of its aril. 8. Vertical section of a seed |—*magnified*.

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## RHODODENDRON LANATUM, H. &amp; A. J. D. D. DC.

Woolly Rhododendron.

TAB. XVI.

Arbuscula ramosa, cortice rugoso, ramis tortis, ramulis petiolis pedunculis foliisque subtus lana molli subappiessa albida vel fulva dense tectis, foliis elliptico-obovatis oblongisve coriaceis brevipetiolatis apice rotundatis apiculatis basi acutis supra (costa basinque versus lanatis exceptis) glabris subtus lana molli appressa sordide albis v. fulvis, corymbo terminali capitato plurifloro, calyce minuto 6-lobato, corolla ochroleuca tubo lato-campanulato intus superne rubro irrorato, limbo lobis 5 rotundatis patentibus integerrimis, filamentibus inclusis, filamentis basi lanatis, ovario tomentoso bicolori, capsula cylindrica emarginata obtusa ferrugineo-floccosa.

SIAM Sikkim-Himalaya in the rocky spurs of the humid mountains and gullies; elev. 10-12,000 feet, most common at Jongri and Chola. M. June; fr. November.

A large shrub or small tree, with the trunk six inches in diameter in the stoutest part, irregularly and repeatedly branching; branches much gnarled and bare of leaves, covered with a dark-coloured rugged bark, very different from the prevailing beautiful papery clothing of the genus: where it breaks off from the younger branches, however, it exposes a delicate pink liber as shown in our figure, whilst the ultimate ramuli are densely clothed with a soft appressed cottony tomentum. The latter, generally of a white or tawny colour, is uniformly spread over the petioles, peduncles, ovarium, and the whole under surface of the leaf, also extending to the upper surface of the latter, along the costa, and to the very base in a less degree. These leaves are confined to the apices of the branches, three and a half to five inches long by about two inches broad, obovate or elliptical, obtuse, with a short mucro, the base rather acute, or at most obtuse (not cordate), to colour a fall yellowish-green. Petioles short, thick, very woolly. Corymbs terminal, of several, 6-10, rather large, inclined flowers. Peduncles an inch and a half long, thickened. Calyx small, reduced to five very minute blunt teeth at the top of the peduncle. Corolla ochroleucous or pale sulphur-colour: the tube broad-campanulate (like that of *B. Wightii*) within, above, and three of the upper lobes in part sprinkled with red dots; limb two inches to two and a half across, of five nearly equal, very spreading, rounded, entire obtuse lobes. Stamens ten, included: filaments slender, slightly curved, downward at the base; anthers dark brown. Ovary oblong-oval, furrowed, thickly woolly, five-celled. Capsules more than an inch long, cylindrical, curved, woolly, obtuse;

In the dense tomentum on the underside of the leaves, this species may be compared with *B. fulgens* and *B. argenteum* among the large shrubby kinds, and with *B. Edgeworthii* and *B. pedunculatum* among others.



J.D.R. del. Fisch. del.

Federic. Boiss. imp.

RHODODENDRON GLAUCUM. Hook. fil.

# KHODODENDRON GLAUCUM, *Hook. fl.*

*Glaucous-leaved Rhododendron.*

## TAB. XVII.

Fraticulus crectus ramosus, ramulis petiolis pedunculis foliisque subtua lepidotis, foliis dlipticis sea elliptico-lanceolatis mncranatis in petiotum brevem angostatis superne denudatis snbtos albo-glaucoscentibus, corymbis tenninalibna ft-8-floris, floribus suberectis mediocribus, calycis 5-partiti lobis ovatis actnia subMaceis, corolla) minute glanduloso-paocctatB rosese tnbo late oampanulato intna bad pubescente, limbi lobis patentibus rotundatis emarginatia, atamioibiu 10, fflamentis ban puberulis, ovario dense squamuloao infetne ndo, capaula ~~subglobose calycem persistentem sequante squamulosa glauca 5-loculari.~~

HAB. Sikldm-Himabya; rocky depressed ridges of Chola, Lachen, and Lachoong; elev. 10-12,000. K May; jr. November.

This constitutes a small *shrub* of the average height of two feet. *Branches* scarcely so thick as a goose-quill, yellowish-brown, often glaucous-white, the younger ones squamulose. *Leaves* rather crowded at the extremities of the branches, 1-3 inches long, usually 1-1 i inch broad, on short petioles, oblong or broadly lanceolate, obtuse, with a macro, upper side deep green, when old naked above, below remarkably glaucous, almost white, and quite dotted with copious little scales, which in the young state covered the whole leaf, and at all times abound on the bracteas, buds, peduncles, and especially on the calyx-segments. *Peduncles* seven to eight almost in an umbel at the apices of the branches, erect, an inch or more long, rather slender. *Flowers* erect or inclined, pale pinkish-purple. *Calyx* deeply five-partite, the lobes ovate, acute, leafy, almost the length of the tube of the corolla. *Corolla* rather more than an inch long, and about as broad in the widest part: *tube* campanulate; *limb* moderately spreading, of five nearly equal rounded emarginate lobes. *Stamens* ten, *bdated: JUamexti* downy at the base. *Ovary* ovate, five-furrowed, upper half densely scaly. *Capsule* short, subglobose, acute, five-valved, scaly, included in the large loose persistent calyx, the valva glaucous, lepidote.

The remarkably glaucous colour\* of the underside of the leaves, and the great development of the calyx, will readily distinguish this species from every other. In foliage, indeed, it has the closest resemblance to *B. vxrgatum*: but in that alone,—the inflorescence and calyx are widely different. The whole plant has a powerful resinous smell, due to exceedingly minute globules of a pale yellow colour, which may be seen to exude from beneath the little scales on the underside of the leaves, and which, in this species, too, abound so much on the other parts of the plant.

These scales, themselves, are very curious on the underside of the leaves of this plant: they are of two kinds; the majority are smaller, pale-coloured, exhibiting several concentric circles of minute, nearly uniform cells; the larger ones are setose at the margin, and consist of a centre or disc of small cells, while the circumference forms a limb or margin of radiating elongated cells (see fig. 6, 7).

\* This glaucous hue is folly retained in the well-dried spediniro, but toppcaw from thuro ~~that have been by any accident wetted.~~

^Tmn\*\*\*m\*\*\*\* . % 1. Stamen. 2. Calyx and pistil. 8. Pistil. 4. Transverse section of the ovary:—~~magnified.~~  
 5. Frntindudedinthecal^andwithepenri^ts17le^<<^^. 6. Portion of a young leaf, showingthe scale:—~~magnified.~~  
 7. Exhibits the two different scales separated from the leaf:—~~more~~ *highly magnified.*





RHODODENDRON MADDENI, *Hook. fl.**Major Maddens' Rhododendron.*

## TAB. XVIII.

Prætex erectus virgatus, ramulis pedunculis petiolis foliisque subter ferrugineo-lepidotis, foliis petiolatis elliptico-lanceolatis utrinque acutis acuminatisve marginibus planis supremo nitidis viridibus, pedunculis 2-8 terminalibus brevibus crossis, calycis brevis 6-fidi lobis inequalibus supremo nunc elongate, corolla extus lepidota ampla, tubo contracto elongato, limbi patentissimi lobis integris, staminibus 18-20, filamentis glaberrimis, stylo longissimo ovarioque lepidotis, capsula dliptioa 10-loculari lignosa.

J [AB. Siklim-Himalaya; inner ranges, very rare: in thickets by the Lachen and Lachoong riven at Choongtam; elev. 6,000 feet. *M. Jane* to August; *fl.* November.

A *shrub* six to eight feet high, branching from the base. *Branches* erect\* supple, covered with pale, papery *bark*. *Leaves* abundant, very bright green, of a coriaceous substance but flaccid, elliptical-lanceolate, acute or acuminate; gradually tapering below into the rather short ferruginous petiole, 4-7 inches long, frequently pendulous, the young ones entirely, the perfect ones beneath only, or sometimes partially above, clothed with dense, white squamules, which become ferruginous in age, the costa below eventually losing them. *Peduncles* about three, short, stout, lepidote. *Calyx* (as in *J. Boylei*) variable in form, always small in proportion to the size of the flower, somewhat membranous at the margin, five-lobed, the lobes obtuse, the upper one generally much prolonged. *Corolla* three and a half to four inches long, and as much across the limb, very handsome, pure white, with a faint blush, chiefly on the upper lobe, rather fleshy, but firm, in substance, the *Me* sparingly lepidote, in shape rather infundibuliform than campanulate, being so much more contracted than is usual, with the Himalayan species; the *limb* very large, spreading, of five, nearly equal, rounded, entire lobes, slightly crenotundulate at the margin, delicately but obscurely veined. *Stamens* eighteen to twenty, as long as the tube: *filaments* very slender, glabrous; *anthers* ochreous-yellow. *Ovary* small for the size of the flower, ten-celled, elliptical, whitish with the copious squamules. *Style* very long, exerted much beyond the stamens and the mouth of the corolla, thickened upwards, lepidote. *Sfyra* large, often morbidly incrassate and lobulate. *Capsule* oval-oblong, cylindrical, short, straight, obtuse at both ends, about an inch and a quarter long, and half that in breadth.

Of this species the foliage and the flowers are feintly odorous. Very different as this may appear at first sight from *R. cinnabarinum* (Tab. VII. of this work), it clearly belongs to the same natural group along with *R. Jtoyki*. The very large white flowers, the numerous stamens, and ten-celled fruit abundantly distinguish it.

I do myself the pleasure to name this truly superb plant in compliment to Major Madden of the Bengal Civil Service, a good and accomplished botanist, to whose learned memoirs on the plants of the temperate and tropical zones of Northwest HimaJaya, the reader may be referred for an excellent account of the vegetation of those regions. The same gentleman's paper on the \*\*\*\*\* north of India may be quoted as a model of its kind.

TAB. XVIII. *Rhododendron Maddeni*. Kg. 1. Stamen. 2. Calyx and pistil. 3. Transverse section of ovary:—magnified. 4. Capsule:—natural size. 5. Portion of the lepidote underside of a leaf:—magnified.



J. D. H. J. F. lith.

Levy & Wicks, imp.

RHODODENDRON TRIFLORUM, Hook. fil.

RHODODENDRON TRIFLORUM, *Hook. fil.**Three-fovmcd Rhododendron.*

TAB. XIX.

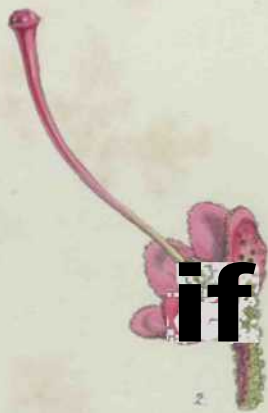
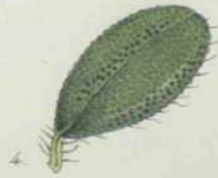
Frutex erectus, ramulis glaucescentibus novellis petiolis pedunculis fblisque subtos crcberrime lepidotis, foliis ovato-lanceolaiis utrinque acutis v. basi subcordatis superne nitidis subtus glands vel subferrugineis, pedoncnlis sub-3 terminatibus gracOibus, calyce brevi B-lobato lepidoto ciliato, corolla flavid@ tubo brevi obconico dorso minute lepidoto lobis oblongis patentibus integris, staminibus 8-10, filamentis elongatis infeme vOlois, ovario 5-locnlari oblongo lepidoto, stylo elongate, stdgmate truncate, capsula oblonga, valvis lignoais.

HAB. Sikkim-Himalaya; inner ranges, on brushy slopes; elev. 7-9,000 feet; scarce. *M.* May, June; *Jr.* November.

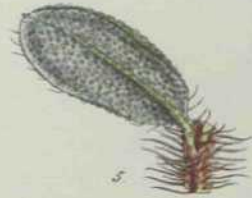
A *shrub* four to six feet high, with erect and rather twiggy *branches* for the genus, the ultimate ones about as thick as a duck's quill: the new shoots lepidote. *Leaves* frequently pendulous, on rather short slender *petioles* (one-third of an inch long), ovato-lanceolate, more or less approaching to oblong or elliptical, two or rarely three inches long, acute at both ends, or cordate at the base and sometimes blunt, with a mucro at the apex, the margin a little recurved, substance rather thin, upper surface smooth and shining, under quite glabrous and glaucous, but so beset with *ferrtyinout* squamules as to partake of that colour. *Peduncle\** generally three together, terminal one-half to three-fourths of an inch long, slender, erect *Caly?* very short, lepidote, cut into five small rounded teeth or lobes. *OoroOa* greenish-yellow, in shape much resembling that of the common garden Azaleas, having a somewhat obconioal tube very open at the mouth, and a limb of five spreading oblong entire segments, which are slightly veiny, nearly two inches across the lobes. *Stamens* eight, much exserted: *aimnnd\** dander hairy near the base. *Ovary* oblong-cylindrical, very lepidote, obtuse, %/emuch longer than the stamens, curved upwards, and terminating in a truncated *stipna*, a little thickened in the disc. *Capsule* half an inch long, straight, cylindrical, often a litUe swollen at the base, obtuse at the point.

The present *Rhododendron* will form a groupe or section along with *R. virgatm*, Hook, fil., *R. setosum*, Don, and *R. nivak* Hook. fil.; all of which have peculiarly narrow segments to the corolla. But the present species is well distinguished by its comparatively large yellow flowers, and the larger, usually pointed, leaves.

TAB. XIX. Fig. 1. G I ^ M Calyx and pistil 8. Transverse section of ovary, i. Small lepidote portion of the underside of the leaf:—magnified. 5. Squamules from the leaf:—more magnified.



if



J. D. R. del. Fitch, lit.

Koenig & Meibohm, sculp.

RHODODENDRON SETOSUM, Wall.

## RHODODENDRON SETOSUM, a».

*Bristly Rhododendron.*

TAB. XX.

Fruticulus humilis ramosissimus, multis setosis foliis utrinque pedunculis calycibusque creberrime lepidotis, foliis parris brevissime petiolatis (petiolo setoso) ellipticis subovatis margine subrecurvis ciliatis, bete viridibus subtus glaucis. T. pallide ferrogineis, pedunculis 8-5 terminalibus brevibus, calycis lobis subfoliaceis ovalibus obtusis coloratis, corollis purpureo-roseis tubo brevissimo lobis 5 oblongis obtusis integris patentibus, staminibus 8-10 exsertis, filamentis basin versus barbatis, ovario brevi lepidoto, stylo rapeme incusato capsula calycem persistentem aequante brevi crasse lepidota 6-loculari.

RHODODENDRON setosum, *Bon, Wen. Tram.* vol. in. p. 408. *Prodr. M. Nep.* p. 152. *Be Cami. Prodr.* vol. vii. p. 784.

HAB. Gossain-Than. *HamxUm, WaUick* in Herb, nostr. Sikkim-Himalayaj open stony and rocky places, abundant; elev. 18-18,000 feet. M. June, July; fr. October.

Stems from a span to a foot high, much and repeatedly branched, branches sometimes verticillate, covered with a papery bark, the youngest ones setose and very lepidote, which last character extends to both sides of the leaves, peduncles, calyx, and ovary. Leaves small, copious towards the ends of the branches, one-third to half an inch long, elliptical or obovate, coriaceous, very obtuse, dark green above, pale and glaucous beneath, setose on the recurved margin; *petiole* short, setose. Peduncles half an inch to one inch long, three to five from the ends of the numerous branches, very lepidote, erect. Flowers inclined. Calyx coloured, red, large for the size of the corolla, deeply cut into five oval woody foliaceous lobes, very squamulose at the back and edge, nearly naked towards the margin. Corolla bright red-rose colour, five-lobed and a half across, five-partite, the tube very short: the lobes spreading, oblong, waved, and serrated at the margin. Stamens eight to ten, much exserted: filaments slender, with a dense tuft of hairs above the base; anthers oblong, ovate, obtuse, very squamulose, five-celled. Style long, ascending, thickened upwards: stigma a depressed disc, bearing four prominent points or lobes. Capsule a quarter of an inch long, subglobose, densely lepidote, enclosed by the persistent calyx.

A small and elegant shrub, with a good deal the aspect of *Modora*, especially in the flowers, but the flowers are not so copious and brighter coloured, and the foliage is Box-like and evergreen. It is the «*TsaUu*» of the Sikkim-Khoteas and Thibetians, who attribute the oppression and headaches attending the crossing of the loftiest passes of East Tibet to the strongly resinous odour of this and of the *Rhododendron anthopcyon*, Wall. («*TsaUu*» of the natives), which certainly abounds to within a few miles of the summits of all the passes, and after hot nuts, is one of the most powerful aromatics of the rarified medium it inhabits. Covering, as it does, extensive moorland tracts and rocky slopes, the brilliant and charming flowers renders it a charming and most lovely object. In its late flowering (June and July) and early fading (October) it is eminently typical of the briefer and more distinctly circumscribed summer of those elevated regions.—and no less so are its powerfully strong odour and copious resinous secretions of a drier climate than any, except a very few of its neighbours enjoy. The hand, on being passed over the foliage and branches, is imbued with the clammy exudation, and the hand retains the scent. An useful volatile oil, of no less marked character than that of the American *Gaultheria* (of which there is a great demand by the perfumers) would probably be yielded by distillation of the foliage.

\* *Gaultheria procumbens*, which yields the «*Oil of Wintergreen*» used by perfumers and by druggists to flavour syrups.

TAB. XX. *Modora tetosum*. Kg. 1. Stamen. 2. Calyx and pistil. 3. Transverse section of ovary. 4. Upper, and 5, under side of a leaf, with a portion of the branch. 6. Scales from the *Int: Ummorh» modified*.

THE  
RHODODENDRONS

OF

SIKKIM-HIMALAYA;

BEING

AN ACCOUNT, BOTANICAL AND GEOGRAPHICAL OF THE

RHODODENDRONS RECENTLY DISCOVERED IN THE MOUNTAINS OF EASTERN HIMALAYA,

FROM

DRAWINGS AND DESCRIPTIONS MADE ON THE SPOT,

DURING A GOVERNMENT BOTANICAL MISSION TO THAT COUNTRY;

BY

JOSEPH DALTON HOOKER, R.N., M.D., F.R.S., F.L.S.,

*fr. fr. fr.*

EDITED BY

SIR W. J. HOOKER, K.H., D.C.L., F.R.S., F.L.S., &c

*Vice-President of the Linnean Society, and Director of the Royal Gardens of Kew.*

PART XXX\*



LONDON:  
REEVE AND BENHAM, HENRIETTA STREET, COVENT GARDEN.

1851.



RHODODENDRON EDGEWORTHII, *Hook. fil.*Mr. Edge-worth's *Rhododendron*.

TAB. XXI.

Fratex rape epiphytus, ranralis petiolis pedonculis capsulis foliisque subtus dense ferragraeo-viUoso-tomentosis, foliis sublonge petiolatis elliptico-ovatis acutis vel acuminatis subcoriaceis rugoso-reticulatis bad obtusis supra nitidis marginibus recurvis, pedunculis 2-3 tenninalibus v. ab innovationibus latenlibos, floribus speciosis albis, calycis ampli 5-partiti lobis foliaceis oblongo-obovatis inaequalibus lanuginosis dliatis, corolla? tubo breriusonlo late campanolato, limbi maximi lobis rotundatis venosis crenato-undulatis, staminibus 10 exsertis, filamentis inferoe villoais, antheris elongatis, ovario dense tomentoso 6-loculari, stylo gracQi banf lanuginoso, capsula oblongo-cylindracea recta obtusa valvis lignosis.

HAB. Sikkim-Hunabya; in valleys of the inner ranges, usually pendulous from trees, sometimes on rocks; elevation 7,000-9,000 feet  
K Hay and June; *fl.* November.

A small *shrub*, with straggling branches, often pendulous upon trees and rocks. *Branches*, the older ones covered with a dark ashy and slightly glaucous bark; young ones and young leaves and bracts, peduncles, petioles, and the underside of the old leaves, densely clothed with a soft ferrugineo-fulvous tomentum, which is easily detached. *Leaves* two to four inches long, ovato-lanceolate, acute or more usually suddenly acuminate, obtuse at the base, the margin recurved, the upper surface fine glossy green, singularly rugose from the deeply impressed reticulated veins; beneath, too, the principal veins are prominent and conspicuous. *Petioles* about three-quarters of an inch long. *Peduncles* terminal or axillary from innovations, usually two or three from the same point, about as long as the petioles. *Flowers* very large, showy, inclined. *Calyx* large, of five deep, membranaceous or foliaceous, obovate, spreading, unequal, coloured lobes, very downy on the back, the edges finely ciliated. *Corolla* white, often tinged with blush and pale yellow: the *tube* rather short, widening much at the mouth, slightly curved, the *limb* unusually large, more than four inches across, spreading, of five nearly equal, rounded, slightly emarginate lobes, crisped at the margin, delicately veined on the surface. *Stamens* ten, a good deal exserted beyond the mouth of the tube: *fiamait* slender, a little dilated downwards, villous on the lower half: *trniken* very large, long in proportion to their breadth, linear-oblong, dark purple-brown. *Ovary* ovoid, six-furrowed, six-celled, densely woolly: *style* elongated, red, woolly below: *tfyma* five- to six-lobed. *Capsule* more than an inch long, straight, oblong-cylindrical, obtuse, densely covered with ferruginous wool. *Seeds* pale-coloured.

A truly superb species from the size of the flowers and their roseate tinge on a white ground, also on account of the variety of rich colour in the leaves, bracts, stipules, calyx, &c., while the very wrinkled surface of the leaf adds much to its beauty. In its floccose character and foliaceous calyx it resembles *B. pendulum*; but in the size and shape of the flower it approaches *B. Dalhousie*, next to which I would place it.

The majority of my specimens were obtained from the land-shoots, or -slips, in the rooky ravines, which bring down in their course those Pines on the limbs of which this species delights to grow.

I dedicate this *Rhododendron* to my accomplished and excellent friend, M. P. Edgeworth, Esq., of the Bengal Civil Service, now Commissioner of Mooltan, who has long and successfully studied the Botany of Western Himalaya, and, of North-western India generally.

TAB. XXI. *Bkioik*^W'^'^A \*\* L Stamen> \*\* ^ " n d ^ 8, to™»«^dc^>»^fiiWl • 4. Pistil with its persistent calyx ^natural tue.





RHODODENDRON <sup>^</sup>ERUGINOSUM. *iiook.fi.**J2rw/inose Rhododendron.*

## TAB. XXII.

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Erutex densissime racemosus, nms cortice papptaeo teotis, ramu<sup>^</sup> petiolis pedunculis folisque supeme glaberrimis, foliis petiolatis obovatis obovato-oblongisve apice acutis v. muticis basi cordatis subtus dense ferrugineo-tomentosis, capitulo conferto vix densifloro, floribus lilacinis v. roscis, pedicels subelongatis, calyee breve 5-dentato, corolla campanulata basi intus plaga sanguinea v. lobo anperiore tantum maculato, staminibus 10, antheris majusculis, filamentis glabris, ovario glabenimo 5-84oculari, capsulis cylindraccis elongatis.

HAB. Sikkim-Himalaya, growing with *Mododmronjym*, and equally abundant, flowering at the same season.

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The colour of the flower, the loose capitulum, long pedicels, and campanulate corolla, distinguish this species from *B. fulfens*; in the fruiting season, too, its longer, more slender capsules afford a marked character, as does the more evidently toothed calyx. When dried, however, they are so difficult to discriminate, that I have felt inclined to unite them. The leaves are identical in all respects, except that those of this species have a remarkable verdigris hue. It is still more closely allied to *B. cmpamUOm*. Of all the Sikkim shrubby Rhododendrons of any size, these two attain the highest level, reaching nearly to 15,000 feet in the remote Lachoong valley, and 14,000 feet in that of the Lachen: 18,000 is their usual level in the ascending zone.

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TAB. XXII. *Bbdodaukwantgmum*. Eg. 1. Stamen. 2. Peduncle, calyx, and pistil. 3. Transverse section of *maxima*.—~~all magnifod.~~

4. Emit:—*naturalize*.

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J. B. Smith del. F. G. Meyer sculp.

Wm. Woodbury sculp.

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# RHODODENDRON SALIGNUM, *Hook. f.*

*taved Rkadodaub*

## TAB. XXIII. A.

!VntiCTInserecta8,ramisCTe(^apice&soioulatimramuloaM, ramuli fiffis utrinque pednncolo oalyoe wroilao^ ertoa creberiiM aqnamoloao.  
 lepidotb, Mis breve petiolatia patulia pendufow eHiptico- y. Eneari-lanceotafia utrinqw Muminufu nbtai ptDidioribni, p^dkelli.  
 solitarily. 8-« donga\* gneflibns erects caljeis lobia p-talia obtnaia aubfotiao\*oorollt lot\* T. riridi-wilplmw, tubo infcto  
 brevi, limbi loins^patdii T. recarns^oAicdanTnis 8 « J T « I ^ ^ vizi-maculatis, staminibus 8-10 exsertis, stylo curvo, ovario  
 brevi albo-lepidoto 5-loenlari.

HAB. Siktim-Himalaya; gra^y and rooky MD. abow Choongtiin, elw. 7,000 ftet; common, il May, Jan..

A slender twiggy 0\*6, two to four feet high, branching fiom.stout tortuous stock; the *brand\**, « t^uck«. crow-quill, rather scattered, bei^g fascicled nmuffi at the top. *Zeam* often drooping, rather florid, of a pde glucoous green, lighter underneath and sometimes ferruginous whew the lepdote scd« aboimd, an i^ to an inch and a half long, scarcelyhalfanmchbroad.acuteormucronate. *Pete\** always elongated, an inch and . half to two inches long, slender. *CoroBayellow*, an inch across the bbea, lepidote, espedaUyro the outride of tl» tube; to^pper lobes are spotted with green, the spois occupying the spec\* between the ^ bro^ «u^oring t«»luc«,t veins. *AMm* hrge, rich »d. brown;/fe««\*sho\* stout, Pilous below. *Omkm* covered with white lepidoto \*pBnuJ.. % « a very rtout, curved,gradually thickened tow«ds the flattened stigmai rose apex. \* \* \* \* \*

Thec^urofthisplimitisstrongfyresinous. A. . spade, it is very clody .Hied to the \* JpMft.; but the have. «e much longer, and the ^ always dong^} c l u ^ by no means satisfactory. \* \* \* \* \*. my prove another state of the same spesdes.

### TAB. XXIII. A

surface of leaf magi ^\*

w-i Phut —tatnmltise. \*. Btmeo. «. Maadt, calyx, nd pufl. 4. Portion o/under

# RHODODENDRON ELIAGNOIDES, *Hook. f.*

*Obovate-leaved Rhododendron.*

## TAB. XXIII. B.

^MnrafcaoaabitonHiBisaptoM^ folia pedicellis calyce corolla  
 Protoclas hmi n f l ^ n i m B o v \* \* ^ " 1 1 " 0 1 ^ more J r i n o g r .  
 erDB warioqua denae lepidotia, ^ " 1 1 ^ J ^ nis argenteisqne, foliis vertkOUm oonfertii brrriter petiolftu late obontb  
 oboordatiBve retaaia obtuaiave mum&h pe\*^ATM tem ^ to solitariis raris hinc elongatis erectis, calycis lobis foliosis yntalis  
 lecnriave rufcoentibus corollis magi p^ca\* tubo brevi ^ ^ ^ j j ^ y ^ ^ ^ , , , , , ; , s w p w D U i o b a o e

antheris majusculis, staminibus 5-10, filamentis basi villosis, ovario brevi 5-lobato dense lepidoto, stylo crasso decurvo, capsula  
baccata.

HAB. Sikkim-Himalaya; open rocky places, elev. 12-15,000 feet; most abundant. M. June and July.

Undoubtedly the smallest species of this section, growing in widely extended clumps, much as heather does, but never so extensively, emitting in sunshine a powerful resinous odour, leaves fasciculated at the apices of the ramuli, generally spreading in a rotate manner, pale yellowish-green, very copiously covered with lepidote squamule, a quarter to half an inch long. Branches an inch to an inch and a half long. Flower large for the size of the plant, of the same form as *J. myrsinifolia* and *himalayana*, but much larger, varying from yellow (the usual colour) to deep red-purple, spotted faintly on the three upper lobes. Stamens generally eight. Capsule very small, a quarter of an inch in length, twice as long as the calyx, five-angled, five-celled. Hecate pale-coloured.

This and the *J. himalayana* and *myrsinifolia* may prove extreme varieties of one species.

TAB. XXIII. *J. himalayana* v. *myrsinifolia*. Figs. 1 and 2. *himalayana*.—natural size 1. *myrsinifolia*.—natural size 1. 3. Anther. 4. Peduncle, calyx, and ovary. 5. Transverse section of ovary:—all magnified. 6. Fruit:—natural size.



## RHODODENDRON CILIATUM, Hook. fil.

Ciliated Rhododendron.

TAB. XXIV.

Stem rigidus, erectus, canibus plurimis validis, ramulis pedunculis pedicellisque hispido-pubescentibus, foliis ellipticis acuminatis coriaceis sinuato-marginatis ciliatis-pilosis senioribus glaberrimis pallidis eroberrime fangineo-punctatis, petalis ovalibus subconfertis (2-6), calyce basi hispido, lobis late ovatis obtusis coriaceis, corolla campanulata pallide purpurea, staminibus 10, filamentis basi pilosis, stylo gracili, capsula brevi eras\* calyce dempto longiore 6-jocilari tria angula contracta.

HAB. Sikkim-Himalaya, inner ranges only, in wet rocky places, rarely in woods. Lachen and Laheong valleys; elev. 9-10,000 feet  
K May; fr. October.

A small very rigid *tree*, growing in damps two feet high, generally in moist rocky places. Odour faintly nana and pleasant. Whole plant more or less pilose and setose, the hair long and fulvous on the young leaves; petiole\* and pedicels patent *Leaves* two, rarely three inches long, sometimes obscurely cordate at the base. Upper surface (except in age) pilose, even villous when young, underneath quite glabrous, *marked with minute orbicular rugineous lines. Brackets* rather membranous, ciliated. *Clay* three to five flowered, terminal; peduncles very stout, one inch long; flowers many. *petals* nearly equal, membranous, veins\* ciliated. *Corolla* one inch and a half long, nearly equal across at the mouth; *Merist* rather contracted below. *Umbels* five-lobed, colour pale reddish-purple, upper lobe obscurely spotted. *Intestines* woody, capitate. *Capitulum* woody, one-third to one-half of an inch long, not only contracted below the apex, *MCI* of the five valves there recurved or beaked, the back covered with minute scales. *Seed* pale woody.

Allied to *R. barbatum*, but widely different in stature, habit, and the scattered scales on the *surface of the leaves*. I have not observed it in other *valleys* where it is common, *leaving the M. in* warm weather.

The scales (in many of its congeners) are orbicular, sessile, and petaloidly attached, formed of three concentric series of cells, the outer elongated in the direction of the union of the circumference series of cells with those next to it. The fragrant oil is secreted chiefly in the discoid cell.

TAB. XXIV. *Rhododendron ciliatum*. Fig. 1. Stamen. 2. Peduncle, calyx, and pistil. 3. Transverse section of ovarium. 4. Fruit. 5. Under surface of portion of leaf. 6. Scales from the same:—magnified.





J.D.H. del. F. & A. sc.

RHODO DDB1N DRON FULGENS, Hook fil

Lowe & Nichols del.

## RHODODENDRON FULGENS, « . /

*Brilliant Rhododendron.*

TAB. XXV.

frutex densissimam ramosam foliosam, ramis cortice papineo tectis, ramulis pedunculis petiolis ovaria folisque raperoe glaberrimis. foliis petiolatis late obovato-v. ovato-ellipticis apice rotundatis basi cordatis marginibus subtus tomento floecoso ferrugineo demum vestitis, capitata densifloris, pedicellis brevibus, calyce obsolete v. brevissimo disciformi lobato, corolla interne ragnnea caepanukta, tubo subcompressa, limbi lobis 5 rotundatis breviusculis recurvis, ataminibus 10, filamentis glabris, ovario ovario bad tombo truncato 8-loculari 8-sulcato, capsulis oblongo-cylindraceis obtusis gibbosis glandis purpuras.

HAB. Sikkim-Himalaya; mountain slopes and spun, elev. 12-14,000 feet; abundant in June; Jr. November and December.

This, the richest ornament of the alpine region in the month of June, forms a very prevalent shrub at the elevations assigned to it, not yielding in abundance to its constant associates, *R. arupiotm* and *R. Maddeni*, and, like the former, pushing forth young leaves of a beautiful verdigris-green in July and August. The foliage is perennial, and gives a singular hue to the bleak snowy mountain-faces immediately overhung by the perpetual snow, contrasting in August in broad masses or broken dumps with the bright scarlet of the Berberry, the golden yellow of the fading Birch and Mountain Ash, the lurid heavy green of the perennial Juniper, and the bleak raw brown of the withered herbage. Whether, then, for the glorious effulgence in spring of its deep scarlet blossoms, which appear to glow like fire in the abort hoar of morning sunlight, or the singular tint it at other seasons wears, this is among the most striking of the plants which lend to these inhospitable regions the varied hues which are denied to the comparatively habitable but gloomy forests of the ton. **perate some on the same mountains.**

Individual shrubs are generally of a rounded outline, about four feet high, and twice as much in diameter, and when growing together they compose an impenetrable thicket, as annoying to the traveller as *R. Hodgtoni* is at lower elevations. The ramuli are bright green, the thickness of a little finger. *Leaves* four inches long and three broad, pretty constant in form, and always coriaceous in texture, with a glossy upper surface, and dense woolly clothing underneath, which wholly obliterates the venation, (hence the name) texture, Wgtly polished and shining. **dark brown; top pink. The calyx is curved, ending in a truncate stigma, not materially enlarged. The calyxes are one to two of a fine plum-purple colour, and covered with a glaucous bloom.**

**Om, i. » pobe » m \* \* \* « \* \* < \* \* » ? " . of t l , plant, except on the inner bracteal scales, which are silky, and on the very young foliage, which has often a little villous pubescence: the latter, which is wholly scentless, is not to be distinguished from that of *R. aruginosum*.**

TAB. XXV. *Rhododendron fulgens*. Fig. 1. Flower. " 2. Podmole, calyx, and ovarium. 3. Transverse section of ovarium. 4. Fruit:—all but figures 1 and 5 magnified.



R. VIRGATUM. Hook fil.



# RHODODENDRON VIRGATUM, Hook. fl.

Twiggy Rhododendron.

TAB. XXVI. A.

Fruticulus gracilis, erectus, virgatus, ramulis petiolatis foliisque aequimaculis, foliis Kautellipticis kuoelafwe maorona\* nbfaualbo^iu. caeantibus vdpalkdiorilas, pediculis b n ^ns axillaribus solitariis raris hinc, bracteis chartaceis concavis suffultis, calyce abbreviato obtuse 5-lobo, coram campanulato glanduloso-punctato, tubo uabooincto, lobis angustis, itaminibus 8-10, filamentis brevibus laevibus, stigmatibus capitate, capsula 5-loculari ovata vel breviter cylindrica squamulis ferrugineis tecta, seminibus pallidis.

HAB. Sikkim-Himalaja; skirts of Kne-fiaeata in vineis, dcr. 8-0,000 feet Lachm vaDej. FLUji/b October.

Decidedly the most slender twiggy species with which I am acquainted, the stems and branches retching four feet high and bearing the flowers in pairs, and axillary: the pedicels two to three lined, eg, «re with shagreened reddish-brown scales, which are longer than the perianth, rigid in texture. ovary on a (M i. paler purple, smooth, 5. \* ^ ^, but of the same form: the tube short, narrow and obconical, the segments narrow and spreading. %&long; 'sfym exerted. My\* b > 6 < to \*, broad rounded. Operculum a half inch long, surrounded at the base by the short appressed calyx.

The axillary flowers and nature of the imbricate bracts are almost peculiar to this species.

TAB. XXVI. A. *Rhododendron virgatum*. Fig. 1. Stamen. 2. Calyx and pistil. 3. Transverse section of ovary. 4. Fruit. 5. Portion of under surface of leaf: - <ff W> 4 magnified.

# RHODODENDRON NIVALIS, Hook. fl.

ji, ^ Bhiodi > dro >

TAB. XXVI. B.

Fruticulus depressus, prostratus, munitus, IMUS TMH... torsis ca... flavae leotii, foliis nivalibus tenuitibus confertis palulis... haque dense ferrugineo-lapidosis, petiolo brevissimo... -i... laevendoto, lobis membranaceis ovatis... compositis... (rubropurpureis), tubo brevissimo, lobis oblongis...

iiiiijusculis, filament is jiniimililus hasi villnsis, ovario deisissime lepidoto, stylo gracili, stigmatc capitoto, caprala calycc longiorc brevisaimi<sup>1</sup>  
olmvsitsi 5-vnlvi.

HAH. Sikkim-lliniiliip; on the loftiest ban: slopes of the mountains on the Thibetan frontier, elcv. 10-18,000 feet. Ft. June and July;  
fr. September anil October.

The hard woody branches of this curious little species, as thick as a goosc-quill, straggle along the ground for a foot or two, presenting brown tufts of vegetation where not half a dozen other plants can exist. The branches are densely interwoven, very harsh and woody, wholly depressed; whence the shrub, spreading horizontally, and barely raised two inches aloive the soil, becomes eminently typical of the arid stern climate it inhabits. The latest to bloom and earliest to mature its seeds, by fur the smallest in foliage, and proportionally largest in flower, most lepidote in vesture, humble in stature, rigid in texture, deformed in habit, yet the most odoriferous, it may be recognized, even in the herbarium, as the production of the loftiest elevation on the surface of the globe,—of the most excessive climate,—of the joint influences of u scorching sun by day, and the keenest frost at night,—of the greatest drought Mowed in a few hours by a saturated atmosphere,—of the balmiest calm alternating with the whirlwind of the Alps. For eight months of the year it is buried under many feet of snow: for the remaining four it is frequently snowed and sunned in the same hour. During genial weather, when the sun heats the soil to 150°, its perfumed foliage scents the air; whilst to snow-storm and frost it is insensible, Mourning through all, expanding its little purple flowers to the day, and only closing them to wither after fertilization has taken place. As the life of a moth may be indefinitely prolonged, whilst its duties are unfulfilled, so the flower of this little mountaineer will remain open through days of fog and sleet, till a mild day faeiUtates the detachment of the pollen and fecundation of the ovarium. This process is almost wholly the effect of the winds; for though humble-bees, and the •• Mines " and " IYitillaries " (*Poljommatu\** and *Argynnia*) amongst butterflies, do exist at the same prodigious elevation, they are too few in number to influence the operations of vegetable life.

The odour of the plant much resembles that of "Km, de Cologne." Lepidote ««\*» generally rather a bright ferruginous-brown, wholly concealing the ramuli, foliage, &c. *Leave*, onc-eighth to one-sixth of an inch long, pale green. 6W/« one-third of an inch across the lobes. The nearest allies of this species arc *Ji. setosum* and *B. Lapponimn*, from which latter it differs in its smaller stature and solitary scRSUO flowers.

This singular little plant attains a loftier elevation, I believe, than any other shrub in the world.

TAH.XXVI.K. *JU+In+m\*+.* % I. Branch and leave\*. 2 and 3. Flowers. 4. Corolla laid open. 5. Stamen. fi.Calyxand pistil. 7. Tranmm. section of ovarium :-*aU magnifed.* S. Fruit -.-*natural \*ize.*





J.D.H. del. Fitch. lith.

Law & Nichols. NY

RHODODENDRON CUNEIFLORUM, Hook. fil.

RHODODENDRON CAMELLIJEFLORUM, *m»k.ju.**CameBiajkmereJtiiododendrtm.*

TAB. XXVIII.

**Frutex p** *hinc usq; epist. junp. caudinis, laxis, parce ramosis, ramulis pedunculis petiolis folisque subtus (junioribus utriusque) dense lepidoto-squamulosis forrogeis, Mis petioMs eDiptids utrinque acutis acuminatis mucisve, cortis ralis. paeon\* pedanralb btimm, aiffliAiiB «ditariis, calyds loWsi ajipMsm 1 0 ^ ^ coriaceis, corolla coracea, tubo brevi basi globosa, lobis patentibus orbicularibus, ataminibus 16 radiatis, filamentis arazariB, antheria majuculis, riilo cmo decurro, onrio glabro 10-locukri, caprala ben oblonga 10-loculari.*

HAB. Sikkim-Himalaya; penddoo^ genera^ *from trunks of trees, often of Pinus, sometimes from rocks, not uncommon; elev. 9-11,000 feet.*  
*fl. July; fr. December.*

This very abnormal species is more allied, in some respects, to the section including 3. *lepidotm*, than to any of the others: in foliage it resembles 3. *Maddeni*, though so much smaller a plant, *wd ato B. cinnaiarimm, from \*hx iht* dried *fkjwerless* specimens are not easily separable. The same very stout percurrent oosta of the leaf is common to all these.

*Stems* two to six feet long, seldom thicker than a goose^uffl, branches long, generally pendulous, though when growing on diffii often obscurely so. *leaves*, as usual in the genus, at the apices of the branches, differing in little but the size from those of 3. *Maddeni*. two and a half to three inches long. *Peduncles* axillary or terminal, very short and stout. *Cab\** half the length of the tube of the corolla, very coriaceous, lepidote, OM or more tobea at times IOTgthosed and membranous. *GoroBa* sparingly lepidote, an inch and a half acnfts, of a very thicks texture, pure wm^ with a faint rosy tinge, all the segments obtuse and entire. i«fa\*«M very large for the sise of the corolla: *filaments* inerassated and hairy at the base, also thickened below the *anther*, which is remarkably adnete and large, orange-red. *Chorum* short, white with lepidote squamute. *8&e* very stout, decurved, gradually enlarging to the abrupt dudform stigma. *Capsule* woody, broad, squamulose, obtuse at both ends, three inches and a quarter long; often diseased, and then spherical (fig. 4). The similarity between the flower and that of a single (wild) *OameiUa* has suggested the trivial name. Odour, as in all the lepidote species, more or *less strongly resinous according to the heat of the day.*

TAB. XXVIII *BiododmdronemMi^fionm*, Fig. 1. Stamen. 2. Peduncle, calyx, and pistil. 3. Innivem section of ovariom. 4. Froit> diseased. 6. Portion of under ride of leaf. 6 *Qu u I a i n x « i t l i t e B a t m e « t e g i 4 ^*





J.H. & Co. Phila., Pa.

Wm. & Schick, Eng.

RHODODENDRON CANDELABRUM, Hook. & Arn.

## RHODODENDRON CANDELABRUM, // &lt;&lt; t. p.

*Candelabra Rhododendron.*

TAB. XXIX.

Frutxramoaisimub, Mis terminalibu saboniaods glabeirimu oblongo-oratia obtuuriu aptalatfc bad oofdatia aobtw ~~glucosomatibus~~  
 margraesubi<mrTO,oarjiito^ ~~aridioris, pedunculis petiolo sequentibus, floribus radiatis petalibus concavis, calyce~~ bnrldfcifanri  
 obscure imequafiter lobato ciliato, corolla pallide rocea, tobo eloDgto campwiukto, Kmbo Wobo, stammBM 10, onrio eonioo^fn.  
 draeco ghadnloao-cfliato.

HAB. Sikkim-Himalaya) elev. 10-11,000 net FL June.

The plant from which the accompanying plate and description an taken, was found in thick Fme-wooda near LaoheD  
 village, before I was well acquainted with the *B. Thmm* (Tab. XII.), of winch I fear it is oiuy • p U b w u e d variety,  
 found growing at a tower elevation than that species usually inhabits, flowering eadjar and in a ahady protected litation.  
 The much shorter calyx (of the same peculiar chMttter, however), ito glanAilar n w ^and ovarium, are the only further  
 distinctions I have been able to detect between them, and they an quite umimportant.

TAB. XXIX. *Rhododendron candelabrum.* Fig. 1. Stamen. 2. Peduncle, calyx, and pistil. 3. Transverse section of ovary:—all magnified.



J. D. H. del. T. Fish. sculp.

Baron & Wilhelm. sculp.

RHODODENDRON CAMPYLOCARPUM. Heck. fil.