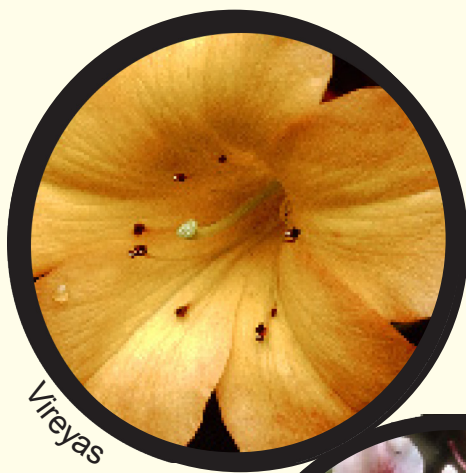


Rhododendrons International

The Online Journal of the World's Rhododendron Organizations



Vireyas



Rhododendrons



Azaleas

Volume 6, 2021, Part 1

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From the Editor

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Parksville, BC
Canada



Rhododendrons International (RI) is an online journal distributed free to all the world's known rhododendron associations for their internal distribution. It can also be accessed without charge on the American Rhododendron Society website at <https://www.rhododendron.org/ri-index.htm>. This sixth volume contains a series of articles originally published in the *Journal American Rhododendron Society* that describe most of the species in many of the lepidote, elepidote and evergreen azalea subsections more available and commonly cultivated. The articles are intended to introduce rhododendron species as opposed to hybrids to rhododendron enthusiasts who may not have easy access to the many books and websites about rhododendron species. Each article contains a brief summary about the cultural potential and characteristics of the species in a different taxonomic grouping, their general identifying taxonomic features and cultural aspects, characteristics and a truss image, and identification of those species most available and having the greatest cultural potential.

Having these articles on each section/subsection online in a single searchable document allows rapid access to the different species and their characteristics by subsection. This capacity will hopefully increase both awareness and interest in species rhododendrons, and encourage their culture. Many gardeners start out growing hybrid rhododendrons, which are the group most available in nursery centres and chapter plant sales, and then as their interest in this remarkable genus grows, gravitate to the culture of species. With over 1000 species in the genus *Rhododendron*, and their habitats ranging from the arctic to alpine areas to the tropics, there is great opportunity for virtually everyone to grow species rhododendrons.

The challenge now becomes as to where to acquire species plants! Specialised nurseries such as Glendoick in Scotland and the Rhododendron Species and Botanic Garden in the USA are two I am most familiar with, and the other main sources might be society plant sales or propagating cuttings and/or seed from plants with provenance obtained from friends, rhododendron societies or businesses! Good luck!

Finally, I would like to express my big appreciation to Sonja Nelson, the volunteer layout editor, for all her hard work in pulling this together. Writing the individual articles extended over a number of years, and formats changed slightly over time, so it was a lot of work for her to bring them altogether in a standardized form.

Rhododendrons, Azaleas, Maddenias and Vireyas

Rhododendrons, Azaleas, Maddenias and Vireyas – their differences and latest systematics

(Reprinted from the Journal American Rhododendron Society 72: Spring 2018.)

(Photos by the author.)

Gardeners new to rhododendrons are sometimes confused and perhaps even intimidated by the different plant names encountered when reading about the amazing genus *Rhododendron*. Here, I briefly explain what some of these terms mean and how they are related.

The genus *Rhododendron* is in the heath family *Ericaceae*, which also includes its namesakes, the heathers and heaths, plus blueberries, cranberries, mountain laurels and a variety of other generally lesser-known plants. It is one of the largest plant genera, with about 1000 species in it, and new species are still regularly being discovered.

Rhododendron is a genus (a group of plants with shared characteristics) and azaleas are a group within that genus, rather than forming a genus of their own. Azaleas may be deciduous or evergreen and other rhododendrons are, with only a few exceptions, all evergreen. Thus, all azaleas are rhododendrons but not all rhododendrons are azaleas.

Linnaeus established the genus *Rhodo-dendron* in 1753. Linnaeus' naming system established "*Azalea*" as a separate genus but it was soon pointed out by other scientists that azaleas should be considered a subset of *Rhododendron* rather than being a genus unto itself. So if you read the scientific name of an azalea (on a plant label at the nursery, for example), you may also see the word *Rhododendron*. The word "azalea" has essentially simply become the common name for a group of plants within the genus *Rhododendron*.

There are no clear-cut lines for distinguishing all azaleas from all other rhododendrons but here are a few characteristics to look for:

1. True rhododendrons (Fig. 1) have ten or more stamens, that is two per petal lobe. Azaleas (Fig. 2) usually have five stamens or one per petal lobe. All rhododendrons and azaleas have five petals in each flower.
2. Azaleas tend to have appressed hairs, i.e., hair parallel to the surface of the leaf. This is particularly true along the midrib on the underside of the leaf (Fig. 3) and is easily seen in "evergreen" azaleas. True rhododendrons instead of hair are often scaly which may look like small "dots" on the under side of the leaf. Azalea leaves are never dotted with scales and are frequently pubescent (hairy) (Fig. 4).
3. Many azaleas are deciduous. True rhododendrons are usually evergreen with the exceptions of *R. mucronulatum* and *R. dauricum*.



Fig. 1. The rhododendron hybrid 'Patricia Marie'.



Fig. 2. The species azalea *R. occidentale*.

4. On average (but there are exceptions), rhododendrons are larger shrubs than are azalea plants, and they have larger leaves.
5. Rhododendron flowers are more bell-shaped and are borne in clusters of blooms called trusses that appear almost spherical, whereas individual azalea blooms are looser, more funnel-shaped or elongated and tubular and most flower clusters are not in trusses.

In recent years “rhododendron” has come to be used by gardeners essentially



Fig. 3. Appressed hairs on the underside of an azalea leaf.



Fig. 4. The underside of a lepidote (*R. nuttallii*) rhododendron leaf.

as a common name for plants in the genus *Rhododendron* that have large, leathery, evergreen leaves. The leaves on azalea plants tend to be smaller in comparison. Within the rhododendrons themselves, leaf-size comparisons are used to make a further division, namely between large-leaf and small-leaf types.

Genus *Rhododendron* Systematics

(systematics is the science of naming and organizing organisms based on their perceived common ancestry (= evolutionary relatedness))

With over a 1000 species in the genus *Rhododendron*, the challenge has been trying to develop an organizational structure that showed how the different species were related to each other. Some early attempts used physical similarities of plant physical structure (morphological features), especially flowers; geographical and altitudinal distributions; or habitat preference, but recent advances in genomics (DNA structure) has shown

that many earlier classifications were not accurate. For example, convergent evolution, where a similar characteristic has evolved independently in different species either over time or in different geographical areas, has occurred, and in other cases, some widely separated species are actually closely related because historically, they had a common ancestor that was wide-ranging. The relationships presented here are the most recent understanding of how *rhododendron* species are related, but may not be the final word as studies are still on-going.

To summarise the terms for the different species categories presently recognised within a genus, the genus' species are divided into different "subgenera," which in turn may contain different "sections," and these may contain different "subsections"! To make it more confusing, in any one of these subgroupings, different subgroups may be grouped into "clades" which indicate they are derived from a now lost common ancestor that the other subgroups may not have had (see Nelson 2021). All this breakdown and grouping is simply an effort to ascertain which relatively small groups of species are most closely related and to group them into a category that can easily be referred to. Thus, the breakdown of *Rhododendron* into its subgenera clades is:

Clade A

(Cladistics (also known as phylogenetic systematics) is the systematic classification of groups of organisms into clades on the basis of shared characteristics thought to derive from a common ancestor.)

- Subgenus *Rhododendron*: Small leaf or lepidotes (Fig. 5, two species with scales on the underside of the leaves). Three sections, about 506 species.
- Subgenus *Choniastrum*: Eleven species.

Clade B

- Subgenus *Hymenanthus*: Large leaf or elepidotes (Fig. 6, without scales), including deciduous azaleas. Two sections, with about 311 species.

Clade C

- Subgenus *Azaleastrum*: Evergreen azaleas (Fig. 7). Three sections, about 90 species.

Sister taxon (denotes the closest relatives of another unit in an evolutionary tree.)

- Subgenus *Therorhodion*: one species (*R. camtschaticum*).

Now that we have looked at the broad clade view, let's look in more detail at the subgenus *Rhododendron*. *Rhododendron* subgenus *Rhododendron* has around 506 species, making it the largest of the now five subgenera, containing nearly half of all known species of *Rhododendron* and all of the lepidote species, the latter having scales on the underside of their leaves.

The subgenus *Rhododendron* now includes three sections:



Fig. 5a. The hybrid lepidote 'Bob's Blue'.



Fig. 5b. The lepidote species *R. edgeworthii*.



Fig. 6a. The elepidote species azalea *R. luteum*.

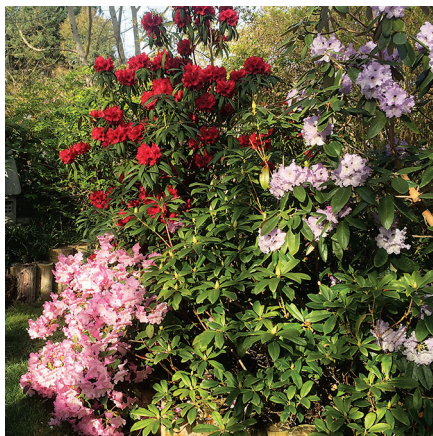


Fig. 6b. 'From L to R, elepidote rhododendron hybrids 'Maureen', Clayoquot Warrior" and 'Muncaster Mist'.

- *Rhododendron* section *Pogonanthum*. Six species; Himalayas and adjacent mountains.
- *Rhododendron* section *Rhododendron*. about 200 species in 28 subsections; temperate to subarctic Northern Hemisphere (includes subsection *Maddenia*).

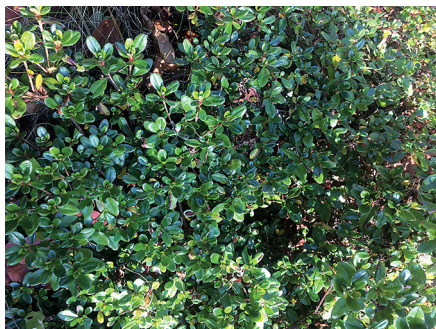


Fig. 7a. The leaves of evergreen azalea 'Hino-crimson', subgenus *Azaleastrum*.



Fig. 7b. The evergreen azalea 'Hino-crimson', subgenus *Azaleastrum*.

- *Rhododendron* section *Schistanthe* (previously subgenus *Vireya*). About 300 species in six (previously seven) subsections; tropical southeast Asia, Australasia.

Maddenias and Vireyas

As a group, rhododendrons are cool growing plants, with those that grow in the tropics being confined to higher elevations on mountains where temperatures are cooler. While most can tolerate freezing conditions, two groups of common garden rhododendrons, the maddenias (Fig. 8) and vireyas (Fig. 9), are more tender and generally do not tolerate freezing. The maddenias (section *Rhododendron*, subsection *Maddenian*), which naturally occur in mainland southeast Asia (e.g., China, Myanmar, India) at mid-elevations on mountains, are:

- Medium to large growing,
- Grown in soil,
- Many species have very fragrant flowers, which are mostly white or light-coloured,
- Relatively few flower shapes and sizes,
- Their leaves are lightly scaled, and
- Many tolerate temperatures to -3° to -5° C (27° to 23° F).

In contrast, vireyas (section *Schistanthe*), which largely occur at elevation on mountains in south-east Asian tropical areas (e.g., New Guinea, Borneo, Sumatra, Malaysian Peninsula, etc.), are:

- Small to large growing,
- Grown in fast draining bark and peat/coir mixes, as many are epiphytic in nature,
- Some species are fragrant, and their flowers occur in many colours,
- Have many flower shapes and sizes,
- Leaves are scaly, and are thus often quite attractive, and
- Most only tolerate temperatures above freezing, but some tolerate to -2° C (28° F).

In North America, maddenias are grown outside without some winter protection

Lepidote vs Elepidote Rhododendrons

Two descriptive terms that are often used to group rhododendrons are lepidote and elepidote, which are important to understand since they to some extent describe the growing conditions which many rhododendrons prefer. Also, it is very difficult, if not impossible, to hybridize plants between these two groups, so even hybrids are either lepidote or elepidote.

Lepidote rhododendrons have scales on the underside of their leaves that protect the plant's stomata (leaf pores) through which oxygen, carbon dioxide, and water vapour pass. The scales have evolved to regulate moisture exchange, to help keep water in the cells in dry times, and help shed it in times of abundance. This allowed plants evolving in the tropics to live in the quick-drying forest duff on the very thin soils of the tropics, or even epiphytically on rocks or tree trunks.

Cold brings many of the same demands as do the tropics on a plant, such as desiccating it with dry winds, and scales have evolved to become adept at dealing with either harsh cold or heat. As a result, lepidote rhododendrons have adapted and spread to nearly all environments, from tropical jungles and Siberian woodlands to mountain meadows and alpine tundra. Because of this wide tolerance of soils, temperatures and exposures, they are often especially useful to gardeners in more extreme environmental habitats.

Other lepidote adaptations, such as fast regrowth after predation from grazing animals, and early bloom to deal with a short growing season in cold climates, give us a plant that is easily pruned to shape and that flowers early to take advantage of a short growing season, again traits advantageous to northern gardeners.

Some Lepidote Rhododendron Species

A. North American species

e.g., *R. groenlandicum* (circumpolar) and *R. minus*.

B. Asian species

e.g., *R. impeditum*, *R. cinnabarinum*, *R. edgeworthii*, *R. rubiginosum*, *R. augustinii*, *R. keiskei*, and all vireyas and maddenias.

Elepidote rhododendrons on the other hand, are without scales to cover their stomata, and this group includes many of the large, leathery, evergreen leaf plants that most of us think of as rhododendrons.

Some Elepidote Rhododendron Species

A. North American species

e.g., *R. catawbiense*, *R. macrophyllum*, and all North American azaleas

B. Asian species

e.g., *R. williamsianum*, *R. calophytum*, *R. arboreum*, *R. bureavii*, *R. decorum*, *R. rex*, *R. yunnanense*, *R. quinquefolium*, and azalea species such as *R. kiusianum*, *R. schlippenbachii*, and *R. stenopetalum* 'Linearifolium'.

mostly in northern California, southern Oregon, and in some Hawaiian locations, while vireyas are only grown outside year round from central California to the Los Angeles area, in southern Florida, and at cooler, moister locations in Hawaii, primarily on the Big Island. With vireyas, the most critical issue for success is the culture medium, with rain frequency and humidity next. On the mainland USA, vireyas are thus primarily either grown in pots or in amended natural soil.

[Author's note: Like many keen gardeners, I like to push the envelope and so grow plants that I know are too tender to survive outside year round in all years on Vancouver Island, British Columbia, Canada. Thus, I grow both maddenias and vireyas in pots to facilitate their movement into sheltered locations when freezing conditions occur. The 13-15 maddenii (1-1.2 m (3.3 -4 ft) high) are in large containers outside year round, except when the temperature goes below -2° C (28° F), during which time the pots are moved into an enclosed garage where the temperature stays above just above freezing. In below freezing conditions, dessication seems to be a main concern!

Because I have hundreds of vireyas in relatively small pots, it is more time-consuming to move them, so they are all moved into greenhouses in early November and then back outside in late March, as even with our relatively mild climate, potential freezing conditions can occur during the winter months. The greenhouses are heated, with the thermostats set at about 3° C (37° F), so they never go below freezing. On sunny winter days, the temperatures in them can increase up to 20+° C (70+° F).]

Acknowledgements

Thanks to Steve Hootman for his constructive comments.

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Nelson, S. 2021. Rhododendrons and Their Evolution. *J. American Rhodo. Soc.* 75: 6-10, 17.



Fig. 8. The maddenia hybrid 'Patricia Marie'.

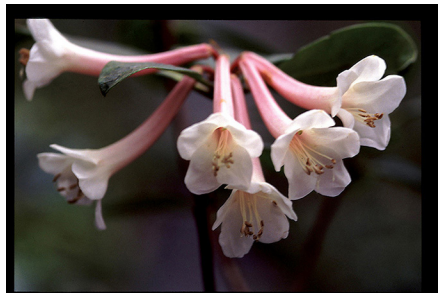


Fig. 9. The vireya species *R. armitii*.

Subgenus Rhododendron (lepidotes) and Subgenus Therorhodium (elepidote)

1. Subsection *Triflora* in Section *Rhododendron* Subgenus *Rhododendron*

(Modified from the Journal American Rhododendron Society 72: Fall 2018)

In genus *Rhododendron*, the largest subgenus is *Rhododendron*, which contains all of the lepidote rhododendrons, species that have scales on the underside of their leaves, and a major section in it also has the name *Rhododendron*. This is a very diverse section, with 28 subsections containing upwards of 200 species. In this article, I will present the species in section *Rhododendron*, subsection *Triflora*, one of the subsections with the most species (at least 25). Triflorums grow particularly well in North America in the milder climates of Oregon through to British Columbia, and *R. augustinii* in particular puts on a spectacular display in our garden in the spring (see page 19).

Cladistics is the systematic classification of groups of organisms into clades on the basis of shared characteristics thought to derive from a common ancestor, and here is a brief review of the taxonomic relationships of this subsection in the genus *Rhododendron* (Nelson 2021):

Genus *Rhododendron*

Clade A

Subgenus *Rhododendron*: Small leaf or lepidotes (have scales on the underside of their leaves). Three sections, about 506 species.

Subgenus *Choniastrum*: Eleven species.

Clade B

Subgenus *Hymenanthes*: Large leaf or elepidotes, including most deciduous azaleas. Two sections, with about 311 species.

Clade C

Subgenus *Azaleastrum*: Nearly everything else, most notably deciduous azaleas such as *R. schlippenbachii* and many evergreen azalea species from northeast Asia. Three sections, about 90 species

Subgenus *Rhododendron*:

1) Section *Pogonanthum* (six species)

2) Section *Rhododendron* (28 subsections, ~200 species)

1. *Afghanica* – 1
2. *Bailey* – 1
3. *Boothia* – 8
4. *Camelliiflora* - 1
5. *Campylogyna* – 1
6. *Caroliniana* – 1
7. *Cinnabarina* – 2
8. *Edgeworthia* – 3
9. *Fragariflora* – 2
10. *Genestieriana* – 1
11. *Glauc* – 10
12. *Heliolepid* – 4
13. *Lapponica* – ~40
14. *Ledum* – 5
15. *Lepidota* - 3
16. *Maddenia* – ~40
17. *Micrantha* – 2
18. *Monantha* – 5
19. *Moupinensis* – 3
20. *Rhododendron* – 3
21. *Rhodorastra* – 5
22. *Saluenensis* – 6
23. *Scabrifolia* – 8
24. *Tephropepia* – 5
25. *Trichoclada* – 8
- 26. *Triflora* – 25**
27. *Uniflora* – 5
28. *Virgata* - 1

3) Section *Schistanthe* (vireyas, 300+ species)

Section *Rhododendron*, Subsection *Triflora* (25 species)

I found the following descriptive summary of the utility of triflorums in the garden (Blake 1986), which I believe captures the features of the subsection well:

“The subsection *Triflora* contains a fascinating collection of what the casual observer could declare as “un-rhodo-like rhododendrons”. Most of the triflorums are noted for their willowy growth and wide open, airy-fairy “butterfly” flowers, usually borne in small trusses. Apart from making a marvellous background for the shrub, rock and peat gardens, they can also be used to create a feature group or even a “walk” in the garden. Although most triflorums can be medium to tall growing, the subsection also contains one of the most appealing prostrate dwarfs, the almost legendary *R. keiskei* ‘Yaku Fairy’ from the mist shrouded heights of Mount Kuromi on the Japanese island of Yakushima.

I would think that all rhododendron lovers would grow at least a few even in a small garden. Personally I would not like to garden without some of the good forms of *R. lutescens* with its breath of spring, the incomparable blue of *R. augustinii*, the pure pink of *R. davidsonianum*, the snowy white of my form of *R. yunnanense*, the amethyst of *R. oreotrephes*, the silvery foliage of *R. zaleucum*, and not forgetting the little baby *R. keiskei* ‘Yaku Fairy’. I find all these easy to grow [where I live in Victoria, Australia], vigorous and quite sun hardy when well mulched. Although we occasionally have heavy frosts, so far my plants have not been harmed. I do provide a little shelter for the early flowering *R. lutescens*. The triflorums certainly add a graceful lightness to our gardens, and I think our gardens would be much the poorer without them.”

The species in subsection *Triflora* have been organised in a number of ways in the literature, with Cox and Cox (1997) dividing them into two fairly distinct alliances: the purple and yellow species and the pink and white ones. McQuire and Robinson (2009) note that with many *Triflora* species, it is not possible to make a definite identification out of flower, and so they have emphasized leaf characteristics, such as the presence of the glaucous (a dull grayish-green or blue color) underside, the presence or absence of bristles, and the density of scales (a magnifying glass helps to discern the latter). Here, I present descriptions of *Triflora* species obtained from Cox and Cox (1997), McQuire and Robinson (2009) and the RSBG website (<https://rhodygarden.org/cms/>), grouped by their leaf characteristics.

Leaf characteristics: (species in **red** are more available)

1. Leaf underside always glaucous (a dull grayish-green or blue color)

R. ambiguum (Sichuan)

R. searsiae (Sichuan)

R. zaleucum (Yunnan and Myanmar) (two var.)

2. Hairs on the leaves

R. augustinii (Hubei, Yunnan, Sichuan and Tibet) (four subsp.)

R. yunnanense (Myanmar, Yunnan and Sichuan)

R. trichanthum (Sichuan)

3. Rounded ovate leaf

R. oreotrepbes (Myanmar, Yunnan, Sichuan and Tibet)

4. The remainder!

R. amesiae (Sichuan)

R. concinnum (Sichuan, Hubei)

R. davidsonianum (Yunnan and Sichuan)

R. keiskei (Japan)

R. lutescens (Sichuan and Yunnan)

R. polylepis (Sichuan)

R. rigidum (Yunnan)

R. siderophyllum (Yunnan and Sichuan)

R. tatsienense (Yunnan and Sichuan)

R. triflorum (Nepal to Tibet to Yunnan) (three var.)

Note: The cultural information for each species was obtained from the RSBG website, and consists of a set of three numbers enclosed in the following within parentheses, e.g., (-5 (-20)/ R2/6 (1.8)).

The first number (“-5”) is the hardiness rating in Fahrenheit degrees and the second number (“-20”) “”) is the hardiness rating in Celsius degrees. This gives an approximation of the lowest temperature the plant can withstand without substantial damage. (See hardiness note below*.)

The second number (“R2”) – R1, R2 or R3, is the ease of cultivation rating. This is a system developed at the RSBG to provide the average gardener with a quick and easy method of selecting the appropriate plant material.

- R1 —easy and reliable using standard methods of cultivation.

- R2 —easy if certain specific cultural requirements are met; these are usually given in the general description (“sharp drainage” or “requires shade” for example).

- R3 — can be difficult even for the experienced grower.

The third number (“6”) is the approximate height in feet in ten years from a two-year old plant, with (“1.8”) the height in metres. This is the subsequent number in double quotes, e.g., “1.8”, using the average rate of growth for that particular clone (or species) under typical garden conditions.

With respect to **Hardiness**, average annual minimum temperature is generally accepted as the key factor in determining the hardiness of a plant, but there are other important factors such as moisture levels, age of the specimen, health, exposure, snow cover and soils. Thus, the minimum temperature given for an accession should be used only as a rough guideline to whether or not it will thrive in a given locale. **Note:** Data utilised is often from Great Britain or is based upon observations at the RSBG.

Species Details:

1. **Leaf underside always glaucous (covered with a white, bluish or greyish waxy bloom).**

R. ambiguum: (Epithet: doubtful)

Very similar to its close relative *R. concinnum* with the same strong growth habit and constitution. This species differs in having yellow flowers. Easy in sun or shade and perfect with any of the blue-purple trifloras. The leaves are white-glaucous beneath and it tends to be more compact in habit than its close relatives. One of the hardiest in the subsection, and while not as showy as *R. lutescens*, is later flowering and hardier. (-10 (-23)\R1\6 (1.8))

R. searsiae: (Epithet: after Sarah C. Sears, American artist)

Rare in cultivation; flowers white or pale rose-purple with light green spots, with an elepidote corolla. Pointed leaves longer and narrower than most in the subsection. Free-flowering, fairly hardy and easily grown, but not particularly showy or distinctive.

R. zaleucum: (Epithet: very white)

Very rare in cultivation, as while it has large and attractive white to pink flowers and fine, reddish young growth, its one of the least hardy in the subsection, as its early growth makes it vulnerable to spring frosts. Glossy narrow leaves with long hairs on the margins. Its most striking character is the intensely glaucous white undersurface of the leaves, due to a coating of wax. Upright bushy growth habit. (+5 (-15)\R1\5 (1.5))



R. ambiguum. Photo: Garth Wedemire.



R. searsiae. Photo: Marc Columbel.



R. zaleucum. Photo: Garth Wedemire.

2. Hairs on the leaves.

***R. augustinii*:** (Epithet: after Augustine Henry, medical officer in Chinese Customs and later Professor of Forestry, Dublin)

An always beautiful species, and one of the most popular species for gardens in areas with a moderate climate (p. 19). Easily grown in sun or shade and very floriferous. Flowers in various shades and depths of blue to lavender-blue with green and ochre “eyes” and different colours of stamens can give a range of effects. Great with white and pink flowered rhododendrons. ‘Cerulean Mist’, an RSBG selection, is one of the finest form in the RSF’s substantial collection of this species. (0 (-18)\R1\6 (1.8))



R. augustinii. Photo: Garth Wedemire.

***R. yunnanense*:** (Epithet: slightly gnawed)

One of the best all-around garden plants in the genus, which is quite variable and closely related to and/or merges with several others. Leaf margins sometimes with hairs/bristles. This easily grown species is adaptable and very floriferous, will tolerate drier sites than most rhododendrons and will flower freely even in considerable shade. Masses of pink to white flowers every year on an upright growing shrub. This species can make a great hedge or screen, and depending on the altitude where clones were initially obtained in the wild, is very variable in hardiness. (0 (-18)\R1\8 (2.4))



R. yunnanense. Photo: Garth Wedemire.

***R. trichanthum*:** (Epithet: with hairy flowers)

The key distinctive feature of this species is the dense covering of hairs/bristles on the leaf, petiole, pedicel, flower, etc. Flower colour varies from dark plum to bluish-mauve, and it is one of the latest to flower in this subsection. Foliage and new growth are very attractive, but it needs good drainage to avoid leaf spot. (-10 (-23)\R1\6 (1.8))



R. tricanthum. Photo: Garth Wedemire.

3. Rounded ovate leaf.

***R. oreotrephes*:** (Epithet: mountain bred)

This is one of the finest for foliage and habit and one of the most easily grown species in cultivation, doing best in light shade. It has beautiful, glaucous, blue-green new foliage and is always reliable, free-blooming, and like all *Triflora*, does not need to be dead-headed. This species appears to bridge subsections *Triflora* and *Cinnabarina* with its elliptic leaf shape and funnel-campanulate flower. ‘Pentland’ is one of the finest and most easily grown cultivars of this species in cultivation, and won an Award of Merit (AM) in 1990, having the darkest purple flowers of any form of the species. (-5 (-20)\R1\6 (1.8))



R. oreotrephes. Photo: Garth Wedemire.

4. The remainder!

***R. amesiae*:** (Epithet: after Mary S. Ames, northeastern Massachusetts)

Like most of the other species in subsection *Triflora*, this is an easy and vigorous hardy species. This species is close to *R. concinnum* and *augustinii* with similar flowers of rose-purple to reddish or pinkish funnel-shaped flowers (mid-spring). It is one of the hardiest of the *Trifloras* and is a floriferous, adaptable and vigorous species that forms a large and bushy upright shrub—perfect with *R. augustinii*, *rigidum* and/or *davidsonianum*. Cox and Cox (1997) consider it either an extreme form of *R. concinnum* or a natural hybrid with *R. trichanthum*, as it has a bristly petiole. (-10 (-23)\R1\6 (1.8))



R. amesiae. Photo: Hans Eiberg.

***R. concinnum*:** (Epithet: neat)

This is an easy and vigorous, hardy species with deep purple to reddish or pinkish funnel-shaped flowers (mid-spring), and is one of the hardiest of Trifloras. This is a floriferous and adaptable species that forms a large and bushy upright shrub – perfect with *R. augustinii*, *rigidum* and/or *davidsonianum*. (-10 (-23)\R1\6 (1.8))

***R. davidsonianum*:** (Epithet: after Dr. W.H. Davidson, Friens Mission in China)

Large upright to spreading evergreen shrubs characterised by the bending up of the leaf blades, forming a “v” in cross-section. It has vigorous upright growth that is easy and floriferous in mid-spring, tolerant of sun or shade, and relatively drought resistant once established. This relative of *R. augustinii* has a similar growth habit, differing in its white to pink or lavender flowers, often with a darker blotch. Looks great when planted with *R. augustinii* and/or *rigidum*. The cultivar ‘Ruth Lyons’ is the very floriferous and slightly fragrant AM form with vibrant widely funnel-shaped deep rose flowers with an unmarked corolla. ‘Caerhays Best’ is another of the most colorful and floriferous cultivars, and is from Caerhays in Cornwall with flowers of palest pink with a large and very prominent reddish blotch. (0 (-18)\R1\6 (1.8))

***R. keiskei*:** Epithet: after Ito Keisuke, Japanese botanist)

This is the only Japanese species



R. concinnum. Photo: Garth Wedemire.



R. davidsonianum. Photo: Garth Wedemire.



R. keiskei. Photo: Garth Wedemire.

in *Triflora*, is probably the hardiest, and is by far the dwarfest member of the subsection. It differs from the other species in its pubescence on the upper leaf surface and the relatively large, brown scales on the lower leaf surface. ‘Yaku Fairy’ is the most dwarf form, and this famous 1970 AM form is a dense and prostrate mound with pale yellow flowers in mid-spring. A choice rock garden or container specimen. Easy and hardy in the garden. Another notable cultivar is ‘Bayport Beauty’ by John Weagle in Nova Scotia, from “seed grown by Captain Steele circa 1964 from Wada.” (-10 (-23)\R1\1 ft (0.3 m) across).

***R. lutescens*:** (Epithet: becoming yellow)

The long, reddish/bronze-tinged leaves usually make this one of the easiest *Triflora* to recognise. Its clones vary in hardiness and are often quite showy, but the larger flowered clones seem to be relatively tender. ‘Bagshot Sands’ is one of the best forms of this popular species, with masses of large yellow flowers in early spring, long willowy leaves, a vigorous bushy habit and bright purple-red new growth. Easy in sun or light shade. (0 (-18)\R1\8 (2.4))

***R. polylepis*:** (Epithet: with many scales)

The dry and flaky scales on the branchlets and leaves characterise this species. It is rare in cultivation and of limited merit horticulturally, although selected purple forms are quite striking.

***R. rigidum*:** (Epithet: stiff)

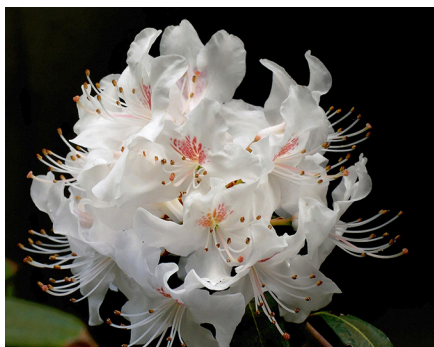
An easy and floriferous species, tidier than the other species, and is similar to *R. yunnanense* and *augustinii* but with white flowers. This species is characterised by its leathery, usually



R. lutescens. Photo: Garth Wedemire.



R. polylepis. Photo: Rinus Manders.



R. rigidum. Photo: Susan Lightburn.

glaucous, evergreen leaves and its rigid, relatively compact form. It has shiny blue-green foliage and an upright habit, and looks great blooming with *R. augustinii* and/or *davidsonianum*. Makes a fine screening plant. Easy and vigorous in sun or light shade. (0 (-18)\R1\6 (1.8))

***R. siderophyllum*:** (Epithet: rusty-coated leaves)

Not as showy as other *Triflora* and somewhat tender, it is similar to *R. tatsienense* and is usually distinguished by its dense trusses of small, typically white flowers and distinctive scales on the lower leaf surfaces. It comes from relatively dry and hot habitats, so it may be useful in hybridizing for greater heat tolerance.

***R. tatsienense*:** (Epithet: from Tatsienlu, now Kanding, W. China)

A very rarely cultivated member of *Triflora*, with smallish, somewhat leathery leaves and white flushed pink to rose-lavender flowers in early spring. Some consider this a stabilized hybrid between the species *R. yunnanense* and *racemosum*, which are often found growing together in the wild.

***R. triflorum*:** (Epithet: three flowers)

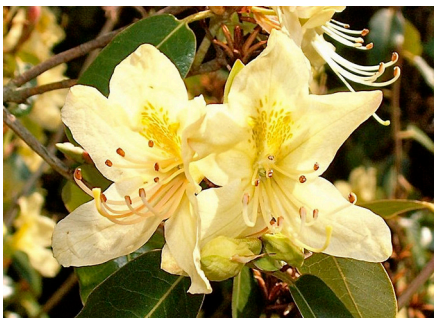
This species is very variable in its features, usually characterised by the distinctive peeling mahogany bark on some forms (stunning with the sun behind it in the late afternoon) and slightly to moderately aromatic shiny leaves, glabrous (without hairs) on the upper surface and glaucous on the lower surface. It has saucer-shaped, small yellow flowers in late spring to early summer. Many of the more



R. siderophyllum. Photo: Steve Henning.



R. tatsienense. Photo: Marc Columbel.



R. triflorum. Photo: Steve Henning.

desirable forms, including those considered to have superior flowers, such as var. *bauhiniiflorum*, are typically less hardy, which may explain its rarer occurrence in culture. (+5 (-15)\R1\4 (1.2))

***R. xichangense*:** Epithet ?)

This may be either a synonym of *R. davidsonianum* or a relatively newly described species, with the main difference between them being in the spacing of the scales on the lower surface of the leaves. It is just now being made available for cultivation by the RSF, and like *R. davidsonianum*, has white to pink flowers in mid-spring. (0 (-18)\R1\6 (1.8))



R. xichangense. Photo: Stephan Bubert.

Acknowledgements

Thanks to Steve Hootman for his constructive comments.

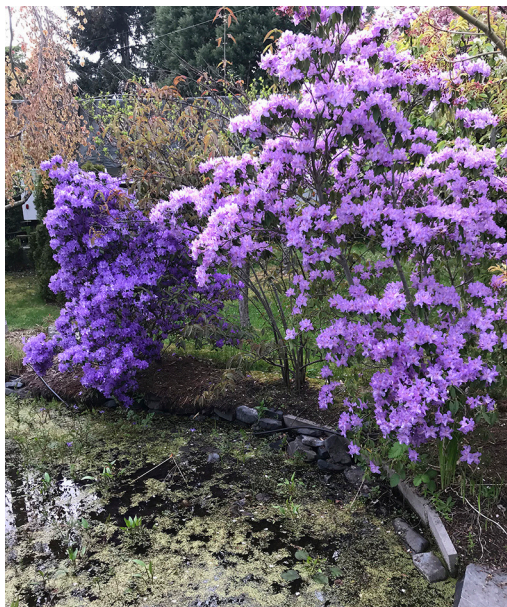
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Nelson, S. 2020. Rhododendrons and Their Evolution. *J. American Rhodo. Soc.* 75: 6-10, 17.



R. augustinii in author's garden. Photo: Glen Jamieson.



R. augustinii in author's garden. Photo: Glen Jamieson.

2. Subsection *Lapponica* in Section *Rhododendron* Subgenus *Rhododendron*

(Modified from the *Journal American Rhododendron Society* 73: Winter 2019)

Above I present species in subsection *Triflora* (see p. 8), and in this article, I will present the species in another major subsection, *Lapponica*, which along with *Maddenia*, is also one of the subsections with the most species (at least 40). *Lapponicas* are higher elevation rhododendrons, many of which are alpine and put on spectacular displays in the wild (see photo this page), and so grow particularly well in northern North America and in Scandinavia.

Cladistics is the systematic classification of groups of organisms into clades on the basis of shared characteristics thought to derive from a common ancestor, and here is a brief review of the taxonomic relationships of this subsection in the genus *Rhododendron* (Nelson 2021):

Genus *Rhododendron*

Clade A

Subgenus *Rhododendron*: Typically smaller leaves with scales on the underside of their leaves (lepidote). Three sections, about 506 species.



Lapponica panorama, the purple flowering rhododendrons on the hillside. Photo: Jonny Larsen

Subgenus *Choniastrum*: Eleven species.

Clade B

Subgenus *Hymenanthus*: Typically larger leaves with no scales on the underside of their leaves (elepidote), including most deciduous azaleas. Two sections, with about 311 species.

Clade C

Subgenus *Azaleastrum*: Nearly everything else, most notably deciduous azaleas such as *R. schlippenbachii* and many evergreen azalea species from south Asia. Three sections, about 90 species

Subgenus *Rhododendron*

1) Section *Pogonanthum* (six species)

2) Section *Rhododendron* (28 subsections, ~200 species)

1. *Afghanica* – 1
2. *Bailey* – 1
3. *Boothia* – 8
4. *Camelliiflora* - 1
5. *Campylogyna* – 1
6. *Caroliniana* – 1
7. *Cinnabarina* – 2
8. *Edgeworthia* – 3
9. *Fragariflora* – 2
10. *Genestieriana* - 1
11. *Glaucia* - 10
12. *Helirolepida* – 4
- 13. *Lapponica* – ~40**
14. *Ledum* - 5
15. *Lepidota* -3
16. *Maddenia* - ~40
17. *Micrantha* - 2
18. *Monantha* – 5
19. *Moupinensia* – 3
20. *Rhododendron* – 3
21. *Rhodorastra* – 5
22. *Saluenensia* – 6
23. *Scabrifolia* – 8

- 24. *Tephropepla* – 5
- 25. *Trichoclada* – 8
- 26. *Triflora* – 25
- 27. *Uniflora* – 5
- 28. *Virgata* - 2

3) Section *Schistanthe* (vireyas, 300+ species)

Section *Rhododendron*, Subsection *Lapponica*

I found the following descriptive summary of *Lapponica* in Blake's (1984) article on dwarf rhododendrons in Kallista, Victoria, Australia, which summarises the features of many of the subsection's species:

"In the *Lapponica* subsection, we find that the overwhelming majority are in the mauve purple colour range, and being very generous in their flowering, are absolutely indispensable in the rock garden, with most very hardy and sun tolerant. *R. polycladum* is almost royal blue in its best forms, *R. russatum*, a little larger in flower than most lapponicas, is deep purple, and in the colour breaks of yellow and white we have *R. flavidum* and *R. rupicola* var. *chryseum*) both yellow flowered, and white is represented by *R. orthocladum* var. *microleucum* and also by the albino forms of *R. chryseum* and *R. flavidum*. Among the taller growing lapponicas is, of course, *R. hippophaeoides*, with its lovely lavender blue flowers but suitable only for background planting. The foliage in most of the species is tiny, particularly in *R. telmateium*, *R. nivale* subsp. *boreale*, *R. edgarianum* [now considered a natural hybrid] and *R. tapetiforme* amongst others. Some turn rich colours in winter, particularly *R. dasypetalum*, and some have lovely glaucous foliage such as *R. fastigiatum*. *R. impeditum* is a delightful plant with quite large light blue flowers and is one of my favorites in the series. There are many more well worth growing, including *R. intricatum* and *R. x lysolepis*, even though this is a hybrid [*R. flavidum* X unknown], the choice usually being dependant on the space available. If you have a bed of lapponicas and are not too much of a purist, a planting of the hybrid 'Chikor' looks very much in keeping, and makes a good foil for the blues, mauves and purples."

Rhododendrons in this subsection are evergreen shrubs from moorland or high altitudes. *R. lapponicum* has a circumpolar distribution, with the remainder found in the Himalayas, especially in western China. These plants do best in cooler garden climate areas, such as Scotland, Scandinavia, Canada and southern New Zealand and Australia, where they make excellent garden plants, often being planted *en masse*. Although cold hardy, they are not easy to grow in warmer

climates as they dislike summer heat.

They are small in all their structures except for *R. cuneatum*, their branchlets and leaves are densely scaly, and their leaves are usually less than 2.5 cm (one inch) long. Their flower colour is mainly at the blue end of the spectrum (lavender to purple), but a few species have white, pink or yellow flowers. Cox and Cox (1997) noted that species in this subsection are among the most taxonomically complex as features are often very variable even within the “same” species. Almost all the species hybridize/merge with their relations and so the boundary between species can be very arbitrary. Many species are rare in cultivation, and are mostly in specialist collections.

This is the largest lepidote section *Rhododendron* subsection, and species have been organised in a number of ways in the literature, with Cox and Cox (1997) not organizing the species into any groups, but adopting the Philipson and Philipson (1975) revision of the subsection, which greatly reduced the number of recognised species. McQuire and Robinson (2009) split the species firstly into three groups based on the scale colour on the leaf underside: of one colour; of two colours, mainly golden brown with a few scattered darker scales; and of two colours, with pale and darker scales mixed in almost equal proportions. Some species listed here were not grouped by them, and so I have listed them as having pale scales. In the first group, their second grouping is based on flower colour: flowers not mauve, lavender, or blue shades; or flowers in these colours. Here, I present descriptions of Laponica species obtained from Cox (1985), Cox and Cox (1997), McQuire and Robinson (2009) and the Rhododendron Species Foundation (RSF) website, grouped by their scale and flower colour characteristics.

Rhododendron*, subsection *Lapponica (about 40 species, 19 discussed, **red** font species are more available)

1. Scales on underside of leaf one colour.

- a. Flowers not mauve, lavender or blue

R. dasypetalum

R. flavidum

- b. Flowers mauve, lavender or blue

R. cuneatum

R. fastigiatum

R. hippophaeoides

R. impeditum

R. intricatum

R. nitidulum

R. polycladum

2. Scales on leaf underside of two colours, but mainly golden brown.

R. orthocladum

R. telmateium

3. Scales on leaf underside of two colours, equal in number

R. lapponicum

R. nivale

R. rupicola

R. russatum

R. amundsenianum

4. Remainder (pale scales)

R. thymifolium

R. tsaii

R. websterianum

R. yungningense

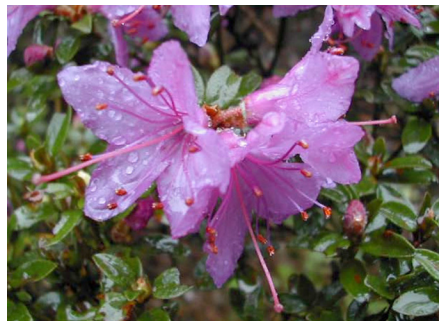
Species Descriptions

1. Scales on underside of leaf one colour.

a. Flowers not mauve, lavender or blue

R. dasypetalum (Epithet: with hairy petals)

Height, 30-90 cm (one to three feet), bright rose-purple flowers. Some cultivated “plants of this species” are considered questionable by Cox (1985), as they have shinier leaves and larger flowers than herbarium specimens, and may be a natural hybrid between *R. saluenense* and other lapponica species. As cultivated, the species has distinctive leaves that are “v-shaped” in cross section, a hairy corolla and relatively long hairs on the calyx.



R. dasypetalum. Photo: Hank Helm.

R. flavidum (Epithet: somewhat yellow)

Height 45-90 cm (1.5 to three feet), pale yellow flowers. White flowers of this species are probably hybrids, perhaps with *R. yunnanense* (Cox 1985). Has shiny leaves, which distinguishes it from *R. rupicola*.

b. Flowers mauve, lavender or blue

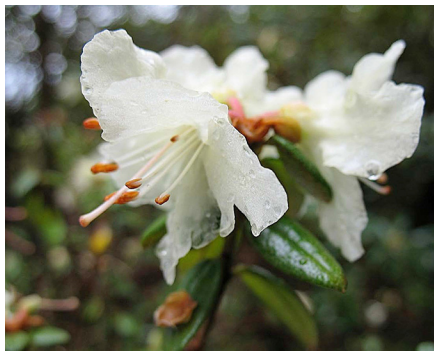
R. cuneatum (Epithet: wedge-shaped)

Unusually large for the subsection, being 0.3 to 4 m (one to twelve feet) in height, with the largest leaves, corolla and calyx.

Has a large deeply lobed calyx, is usually free-flowering, but is more easily frosted than other lapponicas. This species may be a link between the *Lapponica* and *Heliolepidia* subsections, and has natural hybrids with *R. yunnanense* and *R. rubiginosum*.

R. fastigiatum (Epithet: erect)

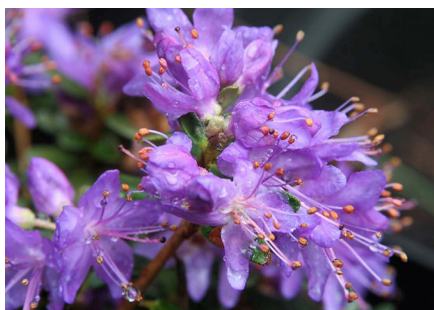
Height usually under 0.6 m (two feet), with purple, occasionally pinkish, flowers. One of the best and easiest of dwarf rhododendrons, being hardy, has a neat, compact form, and excellent glaucous (a white, bluish or grayish waxy bloom) foliage. Sometimes incorrectly sold as *R. impeditum*, but differs from that species in its leaves having a glaucous upper surface rather than a green one, and in having lighter coloured, opaque scales rather than brown scales on their lower surface. The cultivar 'Indigo Steel' is very floriferous, and the flowers cover the plant in mid-spring.



R. flavidum. Photo: Hank Helm.



R. cuneatum. Photo: Dick Cavender.



R. fastigiatum. Photo: Herman Van Ree.

R. hippophaeoides (Epithet: resembling sea buckthorn)

This is also one of the best and most cultivated lapponicas, with a height to 1.24 m (four feet). Leaves are slightly glaucous on their upper surface, with scales overlapping and forming a yellowish buff below. Flowers are lavender blue to near rose. There are two varieties, the more common and finest being var. *hippophaeoides* which is quite frost-hardy but prone to powdery mildew, and var. *occidentale* which has a narrower leaf, more purplish flowers and a smaller inflorescence. This is one of the best of the lapponicas for all-around garden use. It grows a bit larger than most of its close relatives but is still dwarf enough for a rock garden or the smaller urban garden. Very floriferous and easily grown, tolerant of wetter soils (with drainage), full sun best.



R. hippophaeoides var. *hippophaeoides*.
Photo: Staffan Bodén.

R. impeditum (Epithet: tangled)

Seldom over 0.3 m (one foot) in cultivation, this is a dense and mounded dwarf shrub with small aromatic leaves. Many plants sold as this species are in fact *R. fastigiatum*, so check plants for the differences outlined with that species description. Flowers deep purple to rose-purple. Somewhat variable in vigour but hardy and easy to grow wherever summers are not too hot. Forms a very slow-growing, fantastically textural dwarf mound of dark and glossy foliage.



R. impeditum. Photo: Jens Birck.

R. intricatum (Epithet: entangled)

Height to 0.9 m (three feet) in cultivation, with lavender flowers that are tubular with spreading lobes. Attractive, with frost-hardy flowers, but hard to propagate so less common in gardens.



R. intricatum. Photo: Hans Elberg.

R. nitidulum (Epithet: shiny)

Height to 1.3 m (four+ feet), flowers rosy lilac to violet purple. This is a neat, dense grower with tiny leaves of good colour, and quite similar to some forms of *R. nivale*. Var. *omeiense* is a dwarf evergreen shrub with tiny and densely scaly leaves. The flowers of this rarely grown species are violet in color. A fine alpine species with a dense, twiggy habit and attractive small leaves.

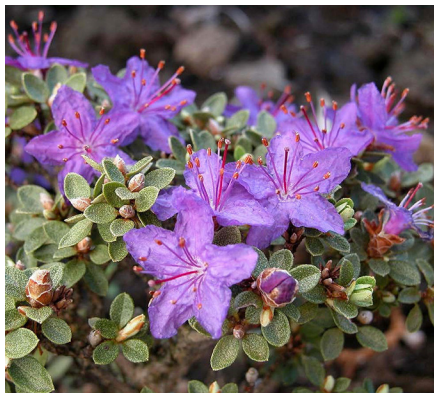
R. polycladum (Epithet: sparkling)

Height to 1.2 m (four feet), flowers lavender to a rich purple blue. It has narrow leaves with rangy, slender arching shoots, and so benefits from pruning to improve its shape. It's usually cultivated as *R. polycladum* Scintillans Group.

2. Scales on leaf underside of two colours, but mainly golden brown.

R. orthocladum (Epithet: with straight shoots)

Height to 1.3 m (four+ feet), with deep lavender-blue to purple flowers. Is less rangy and has a shorter style than *R. polycladum*. Sometimes sold as var. *microleucum*, which is an albino form with frost-hardy white flowers, so not really a variety.



R. nitidulum var. *nitidulum*. Photo: Jens Birck.



R. polycladum. Photo: Steve Henning.



R. orthocladum var. *orthocladum*. Photo: Hank Helm.

R. telmateium (Epithet: from the marshes)

This species is hard to identify conclusively, as it has few distinguishing features from many of the other lapponicas. It is scarce in cultivation under the species name, and is usually sold as either *Diacritum*, *Pycnocladum*, *Drummonium* or *Idoneum* Group, which are all former species names.



R. telmateium. Photo: Steve Henning.

3. Scales on leaf underside of two colours, equal in number

R. amundsenianum (Epithet: ?)

A newly introduced species from the RSF that has similar features to the well-known species in that group (*R. russatum*, *rupicola*, etc.). Relatively large leaves for this group and densely covered with dark brown scales beneath. Its flowers are relatively large and mostly a good blue-purple. Best in good light with excellent drainage.



R. amundsenianum. Photo: Kurt Hansen.

R. lapponicum (Epithet: from Lapland).

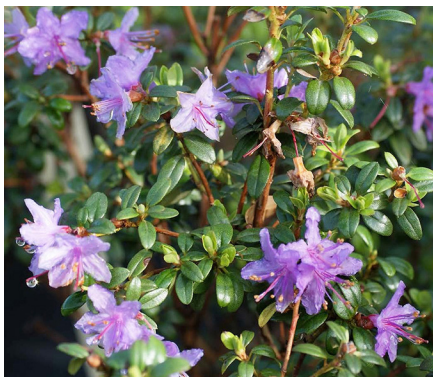
Height to 1 m (three+ feet) with pale magenta-rose to purple flowers. Its distinguishing features are densely lepidote leaves with bicoloured scales, early flowering, and its sparse hanging leaves and bronze winter colouring that can make the plant look as if it were dead. The best form is the *Parvifolium* Group from coastal Japan, Korea and Siberia, as their frost-hardy flowers open in January in many places. It is a circumpolar species, and the really dwarf forms from the Arctic are almost impossible to grow in cultivation as they cannot tolerate warmer conditions.



R. lapponicum. Photo: Garth Wedemire.

R. nivale (Epithet: snowy)

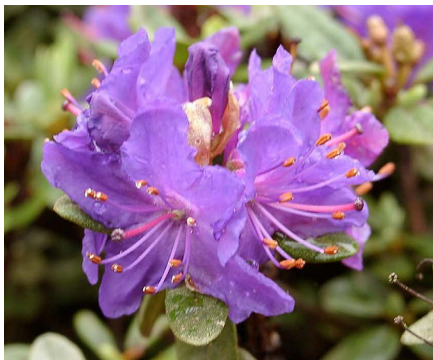
Height to 1 m (three+ feet), prostrate, with deep purple to lilac flowers. It has contrasting pale and dark scales, and on Himalayan hillsides, looks like a heather moorland from a distance when flowering. There are two common subspecies, subsp. *nivale* from the highest elevations (up to 5800 m (19,000 feet)), with very tiny leaves and which are only successfully grown in cool northern gardens and subsp. *boreale*, which grows at lower elevations and is generally taller. Subsp. *australe* is more upright and very rare in cultivation.



R. nivale subsp. *boreale*. Photo: A. J. Laros.

R. rupicola (Epithet: dweller in stony places)

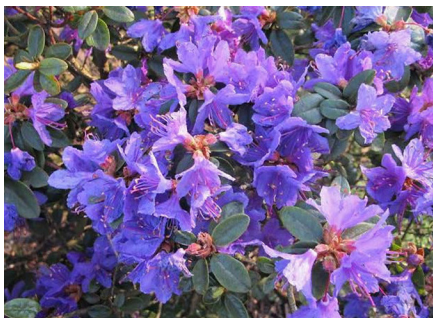
Height to 0.6 m (two+ feet), with intense purple to crimson flowers in var. *rupicola* and yellow flowers in var. *chryseum*, which make it a nice contrast to the other lapponicas. The very deep purple flowers distinguish var. *rupicola* from all other lapponicas except for *R. russatum*.



R. rupicola var. *rupicola*. Photo: Steve Henning.

R. russatum (Epithet: reddened)

Height to 1.8 m (six feet), low and compact to tall and straggly, with deep purple blue to lilac flowers. Relatively large leaves and deep-coloured flowers are distinguishing, and its striking flowers make it one of the most widely grown lapponicas.



R. russatum. Photo: Han Boerrigter.

4. Remainder (pale scales)

R. thymifolium (Epithet: thyme-like leaves)

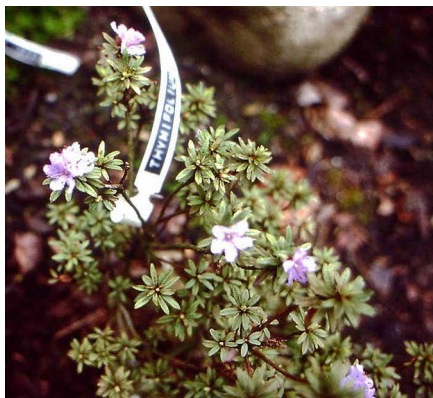
Height to 30 cm (one foot), with small grey-green leaves and usually solitary flowers. Has an upright habit. Scales dense and fawn coloured. A pretty plant in flower and foliage, and quite distinctive.

R. tsaii (Epithet: ?)

Height to 1.3 m (four feet) with dense buff scales on the leaves lower side. A recently introduced dwarf alpine species by the RSF with small and narrow, gray-green leaves. Lavender to pale purple flowers in mid-spring but with a much denser and smaller growth habit than the closely related *R. hippophaeoides*. Easy in full sun with good drainage and very floriferous. Seems to be drought tolerant and a great all-around garden plant.

R. websterianum (Epithet: ?)

Height to 1.5 m (five feet), and is much-branched and more erect than *R. nitidulum*, with buff rather than golden scales. It is characterised by new growth at its time of flowering, and looks like a smaller leaved *R. hippophaeoides*. Many plants obtained prior to 1990 may actually be *R. hippophaeoides*, as the true species may not have been introduced until that date.



R. thymifolium. Photo by Stephan Bubert.



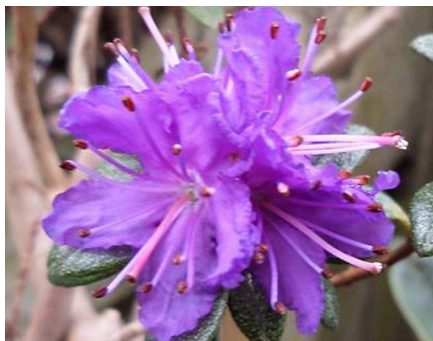
R. tsaii. Photo: Kurt Hansen.



R. websterianum var. *websterianum*.
Photo: Hans Elberg.

R. yungningense (Epithet: ?)

Height to 1.3 m (four feet), habit erect, rounded low shrub. Fawn to rust coloured scale with a dark centre on the leaf's lower side. Deep purplish-blue to rose lavender flowers, with a very variable calyx—often irregular with margins with long hairs. Not particularly showy and characterised by its dull green leaves and variable calyx. Plants often sold earlier as *R. glomerulatum*, now a synonym.



R. yungningense. Photo: Kurt Hansen.

Acknowledgements

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3. Subsections *Maddenia*, *Boothia* and *Edgeworthia* in Section *Rhododendron* Subgenus *Rhododendron*

(Modified from the Journal American Rhododendron Society 73: Fall 2019)

Above I discussed first the general characteristics and taxonomic relationships among the main types of rhododendrons in cultivation, i.e., rhododendrons, azaleas, vireyas and maddenias (see p. 1). Above I discussed species in subsections *Triflora* (see p. 8) and *Lapponica* (see p. 20), and in this article, I will present the species in three other subsections, *Maddenia*, which along with *Lapponica* is one of the subsections with the most species (at least 40), and the smaller subsections *Edgeworthia* and *Boothia*, as species in them are interchangeable in terms of their cultivation demands. Although many of these species may not be hardy below freezing, many of the smaller growing plants from these subsections make excellent container specimens for the greenhouse, sun-room, or other well lighted indoor space during the cold season and for the patio, terrace or deck during the rest of the year.

Maddenia species are moderately sized



R. edgeworthii growing high in the crotch of a tree in Yunnan. Photo by the author.

rhododendrons, with many in the garden growing up to five m (16 ft) or so, but they respond well to pruning and I keep mine in pots pruned to about 1.5 m (five ft). Some like *R. nuttallii* have very textured leaves which are purple when young, and many have very fragrant flowers, which are generally creamy white to white tinged pink. Some are very tender and cannot tolerate any freezing temperatures, while others are more tolerant, like *R. maddenii* subsp. *crassum* which have survived and flowered in my garden at temperatures as cold as -6° C (21° F).

Boothia species are smaller than the related *Maddenia* species, with charming white or yellow flowers. They are usually epiphytes in the wild, so require good drainage, and they make good pot plants but as they are not scented, they are not as popular as the *Maddenia*. The three *Edgeworthia* species are characterised by the very hairy leaf under-surface and white or yellow flowers. These species are also epiphytes and also need good drainage, such as in a raised partly shaded bed, on a very steep bank, or on rocks or mossy logs in wet areas. In Asia, I mostly saw *R. edgeworthii* growing epiphytically high in trees where organic debris had accumulated, usually in the fork where large branches extended outwards from the trunk (e.g., p. 32).

Mark and Abbie Jury describe some of the gardening characteristics of maddenias from their perspective in New Zealand (<https://jury.co.nz/2012/10/26/8695/>).

“Allow us to introduce you to “*Maddenia*” rhododendrons. We are pretty keen on them, although you may not share our enthusiasm if you think all rhododendrons should have the tight ball truss of blooms which is usually regarded as typical of rhododendrons. Maddenias don’t hold their flowers in that style. But the subsection *Maddenia* does include the spectacular nuttalliis with their huge trumpets. I rate these as the most stunning rhododendrons of all with their flowers which look as if they have been cast out of wax and their wonderful, big leaves which are heavily veined—described as bullate foliage. There is nothing quite like them! ...

There are two huge pluses for the maddenias. Most are scented, some strongly so. *R. polyandrum* [now *R. maddenii* subsp. *maddenii*] can waft out for a metre (yard) or two which is an indication of a strong scent. Many will pass the 30 cm (one foot) sniff test which is good. And if you are willing to risk the pollen on the nose, most have a sweet scent when you bury your face in the flower. The second big bonus is that the maddenias show much better resistance to thrips than most other rhododendrons. Thrips are nasty sucking insects that hide away beneath the leaves, sucking out the chlorophyll....

There is a preponderance of whites and pastels in the maddenias and where there are coloured ones, they lean to the subtler, softer shades. In other words, there are no pure reds, purples, blues or oranges. We don’t mind because we can get the stronger colours in azaleas and other types of rhododendrons. Some of the maddenia hybrids flower so heavily that it can be like viewing a wall of bloom with barely any foliage visible at all. I should perhaps mention also that most of

the maddenias types don't make tidy compact little buns of bushes either. They are inclined to be more open in their growth, though by no means are all of them giants. Some can only be described as leggy, but all is forgiven when they flower. Besides, another attractive feature of these rhododendrons is the lovely peeling cinnamon bark many have. If they were bushy, dense plants, you would never see it.

The *Maddenia* were first introduced to the West in 1849 by the famous plant collector Joseph Hooker. For reasons which are not entirely clear, he named them after Lieutenant Colonel E. Madden of the Bengal Civil Service. How random is that? Given that these rhododendrons are found in northern India, Burma, the milder areas of Tibet, southern China, Vietnam, Laos, and Thailand, maybe Lt.-Col. Madden was particularly helpful to Hooker's expeditions?

Internationally, the maddenias are rated as subtropical and somewhat tender, so they are the envy of gardeners from cold climates. The climate in New Zealand is so temperate that you are able to grow most of the maddenias in all but the coldest, inland conditions. They form the backbone of the rhododendron collection in our garden and are later flowering than many other rhododendrons."

As mentioned on page 7, I grow most of my 15+ maddenias on Vancouver Island in western Canada, where we can have winter temperatures below freezing (over the past decade, the coldest has been to -6° C (21° F) overnight, warming during the day), in large pots. *R. maddenias* var. *crassum* survives well in the garden year-round. This allows me to move them into a sheltered location, typically our garage, which has a fan and a small heater to ensure a slightly above freezing temperature, during periods of freezing, which typically only lasts for a week or two during the winter. I also grow *R. edgeworthii* in the garden, and they flower every year, although sometimes there is a little winter leaf damage from either the cold or dehydration.

Ken Cox has summarised plant hardiness and the conditions that determine it (<https://www.glendoick.com/Plant-Hardiness-in-Scotland>) and notes that in Glendoick, Scotland, maddenias that have survived recent hard winters are *R. maddenias* var. *crassum*, *R. changii*, *R. ciliatum*, *R. fletcherianum* 'Yellow Bunting', and *R. lindleyi* (except in the severest winters) (<https://www.glendoick.com/Maddenias-Rhododendrons>).

In terms of how maddenias are related to other rhododendrons, it is worth repeating how the species of rhododendrons are grouped.

Cladistics is the systematic classification of groups of organisms into clades on the basis of shared characteristics thought to derive from a common ancestor (Nelson 2021), and here is a brief review of the taxonomic relationships of the subsections *Maddenia*, *Boothia* and *Edgeworthia* in the genus *Rhododendron*.

Genus *Rhododendron*

Clade A

Subgenus *Rhododendron*: Typically smaller leaves with scales on the underside of their leaves (lepidote). Three sections, about 506 species.

Subgenus *Choniastrum*: Eleven species.

Clade B

Subgenus *Hymenanthes*: Typically larger leaves with no scales on the underside of their leaves (elepidote), including most deciduous azaleas. Two sections, with about 311 species.

Clade C

Subgenus *Azaleastrum*: Nearly everything else, most notably deciduous azaleas such as *R. schlippenbachii* and many evergreen azalea species from south Asia. Three sections, about 90 species

The subgenus *Rhododendron* is organised as follows:

1) Section *Pogonanthum* (six species)

2) Section *Rhododendron* (28 subsections, ~200 species)

1. *Afghanica* – 1
2. *Bailey* – 1
3. *Boothia* – 8
4. *Camelliiflora* - 1
5. *Campylogyna* – 1
6. *Caroliniana* – 1
7. *Cinnabarina* – 2
8. *Edgeworthia* – 3
9. *Fragariflora* – 2
10. *Genestieriana* - 1
11. *Glaucia* - 10
12. *Helirolepida* – 4
13. *Lapponica* – ~40
14. *Ledum* - 5
15. *Lepidota* - 3
16. *Maddenia* – ~40
17. *Micrantha* - 2

18. *Monantha* – 5
19. *Moupinensia* – 3
20. *Rhododendron* – 3
21. *Rhodorastra* – 5
22. *Saluenensia* – 6
23. *Scabrifolia* – 8
24. *Tephropepla* – 5
25. *Trichoclada* – 8
26. *Triflora* – 25
27. *Uniflora* – 5
28. *Virgata* – 2

3) Section *Schistanthe* (vireyas, 300+ species)

Section *Rhododendron* A. Subsection *Maddenia*

Subsection *Maddenia* is a large and widespread group of upwards of 40+ lepidote (scale-bearing) species. Members of this diverse group are found terrestrially or as epiphytes from the eastern Himalaya (Nepal) in the west to southeastern China and adjacent regions of Vietnam, Laos, and Thailand in the east. With a few notable exceptions, species in this subsection are tender to semi-hardy in most of the rhododendron growing areas of the world. They do exceptionally well outdoors in the milder areas (minimum temperatures above freezing) in southern England, New Zealand, southeastern Australia, and in coastal northern California and coastal Oregon in the USA. They typically have large, often highly fragrant flowers and a straggly or open growth habit. Many have beautiful smooth and exfoliating bark and/or colorful and interesting foliage, and many forms flower quite late in the season, well past the rush of spring blooming (<https://rhodygarden.org/cms/species-profile-r-maddenii/>).

As one of the largest lepidote subsections, the *Maddenia* subsection has been subject to many botanical revisions, with the number of species regularly changing. The differences between many related species is small, and in cultivation, many cannot be identified when not flowering. Species have been organised in a number of ways in the literature, with Davidian (1982) creating the series *Maddenii* and subseries referred to below based on morphological similarities—the number of stamens and calyx size. Cox and Cox (1997) organized them by Alliance: *Maddenia* (one species), *Dalhousiae* (seven species), *Megacalyx* (one species), and *Ciliacalyx/Johnstoneanum* (19 species). Cox (1985) noted that most species are too large to be described in their “smaller species” publication (they only discuss four species), and state that Davidian (1982) hived off the smaller *Maddenia* into

his separate *Ciliatum* series, which may make sense from a gardener's perspective but not from a taxonomic one.

I have chosen to use the species organizational scheme presented by McQuire and Robinson (2009) (with some additional species), as while it may in the future change taxonomically, it gives the most recent suggested species organisation and is based on plant structures readily discernable. Here, I thus present descriptions of species in the three subsections obtained from Cox (1985, 1990), Cox and Cox (1997), McQuire and Robinson (2009) and the Rhododendron Species Foundation (RSF) website; **red font** species are those more available.

Rhododendron*, subsection *Maddenii (about 40 species, 30 discussed)

Group A (*R. maddenii* and its relatives (former *Maddenii* Subseries) (stamens (15)-17-25; calyx variable)

R. maddenii

Group B (former *R. megacalyx* Subseries) (stamens 10, calyx large and deeply lobed)

R. dalhousiae

R. excellens

R. headfortianum

R. levinei

R. liliiflorum

R. lindleyi

R. megacalyx

R. nuttallii

R. taggianum

Group C (stamens 8-10 (11-13), calyx small)

a) C1 (former *Ciliatum* series and *R. johnstoneanum*): branchlets and calyx bristly, leaf margins and petioles usually ciliate, style impressed)

R. burmanicum

R. ciliatum

R. changii

R. dendricola

R. fletcherianum

R. johnstoneanum

R. valentinianum

R. valentiniodes

R. walongense

b. C2 (leaves less rugulose and ciliate than those in C1, impressed style)

R. formosum (var. *formosum* and var. *inequale*)

R. leptocladon

R. pachypodium

c. C3 (the Cilicalyx aggregate) (tapered style, small calyx)

R. carneum

R. ciliicalyx

R. horlickianum

R. ludwigianum

R. lyi

R. parryae

R. roseatum

R. veitchianum

Species Descriptions

Group A. *R. maddenii* and its relatives (former *Maddenii* Subseries) (stamens (15)-17-25; calyx variable)

R. maddenii (Epithet: after Lt.-Col. E. Madden, a traveller in India)

R. maddenii is the type species for this subsection, meaning it is the species from which the subsection was originally described. It is an extremely variable species into which all eight members of the former subseries *Maddenii* (under the old Balfourian system of classification), except *R. excellens*, have been lumped. It is distinguished from the other members of subsection *Maddenia* primarily by



R. maddenii. Photo: Jonny Larsen.



R. maddenii subsp. *crassum*. Photo: Everard Daniel.

its greater number of stamens and ovary chambers. Taken as a whole, these eight “former” species occur from the Sikkim Himalaya in the west through China and Burma to Vietnam in the east. As one would expect from a group of plants with such an extensive range, there is a tremendous variation in the morphological features that are typically used to separate closely related taxa, including such things as flower size, number of stamens, and scale density. Unfortunately, most of this variability and intergradation of distinguishing characteristics cannot be correlated sufficiently enough with important factors such as natural range to define clear-cut taxa. This is the botanical justification for the merging of this complex and closely related group of “species” into the single species *maddenii*.

Within this classification scheme, *R. maddenii* is divided into subspecies *maddenii* from the western end of the range, and subspecies *crassum*, generally found in the eastern half of the range. Included within subsp. *maddenii* are the former species *calophyllum*, *brachysiphon*, *maddenii*, and *polyandrum*. These all have a truncated apex on the fruiting capsules. The subsp. *crassum* includes the former species *crassum*, *manipurensis*, *chapaense*, and *odoriferum*. Members of this group have rounded capsule apices and generally wider leaves.

This species grows 1-3 m (3-12 ft) high, with flaking bark. Its leaves are a dark, shiny green, and its fragrant flowers are white suffused with rose or pale pink, densely scaly on the outside. This species differs from other *Maddenia* by having 15-25 stamens, rather than the normal 10-12 (except for *R. excellens*, which has 15), and an ovary of 8-12 chambers, whereas other *Maddenia* have 5-7 chambers. This species is useful for its scent, its relatively late flowering (in June in my garden) and its heat tolerance, and being terrestrial, is more tolerant of different soil types than the more epiphytic wild *Maddenia*. Subsp. *crassum* is typically quite a bit harder than subsp. *maddenii* with the Chapaense Group from North Vietnam the hardest of them all; its epithet = fleshy.

Group B. (former *R. megacalyx* Subseries) (stamens 10, calyx large and deeply lobed)

R. dalhousiae (Epithet: after Lady Dalhousie, wife of the Governor-General of India)

This 1-3.5 m (3-12 ft), somewhat leggy shrub, has brown, peeling bark. Pedicels are pubescent and flowers are fragrant, greenish-yellow in bud, fading to cream when open (var. *dalhousiae*) or creamy white to pale yellow with five bold red stripes down the lobes



R. dalhousiae var. *dalhousiae*. Photo: Gerard Wyatt.

(var. *rhabdotum*, epithet = striped, usually flowering several weeks later (June to August) than var. *dalhousiae*).

This species is often epiphytic in the wild, so requires perfect drainage, and is relatively tender, so needs protection at below freezing temperatures. This species is closely related to *R. lindleyi* and *R. taggianum* but is distinguished by its pubescent pedicel and yellow flowers.



R. dalhousiae var. *rhabdotum*. Photo: Jeanine and Calvin Parsons.

R. excellens (Epithet: excellent)

Growing to three m (ten ft), this leggy shrub from SW Yunnan and Vietnam is closely related to *R. nuttallii* but typically with narrower foliage that is more strongly glaucous-white beneath, with prominent brown scales on the upper leaf surfaces. Very large and fragrant white flowers with a strong yellow-orange blotch in late spring to early summer. Smooth and peeling bark. The hardiest of the larger-flowered maddenias, with 12-15 very short stamens. It looks like a smaller-leaved *R. nuttallii*.



R. excellens. Photo: Susan Lightburn.

R. headfortianum (Epithet: after the Marquess of Headfort) (No photo)

This a small, even dwarf, 0.15-1.2 m (0.5-4 ft) high shrub from Tibet and Assam, with creamy-yellow, sometimes tinged with pink, flowers. Cox and Cox (1997) listed it as a Group within *R. taggianum*, but it is a more shapely, upright shrub, now felt to be its own species.

R. liliiflorum (Epithet: lily flowers)

This species in Guizhou and Guangxi, China, grows to 3-8 m (10-26 ft) high. It has reddish, peeling bark with white, fragrant flowers densely scaly on the outside. The calyx is lobed more than half its length. A Chinese relative of *R. lindleyi* and *R. taggianum*, it differs by having a more scaly corolla and a later flowering time (May-June) and is substantially hardier than any of its close relatives.



R. liliiflorum. Photo: Dr. Stephan Bubert.

R. lindleyi (Epithet: after Dr. John Lindley, botanist and secretary to the RHS)

From Nepal to Assam, this 0.75-5 m (2.5-15 ft) high straggly shrub is usually epiphytic on trees or cliffs in the wild. Its flowers buds are large and rounded, and its flowers are scented, white with an often an orange base flowers, with up to twelve flowers per truss. Its calyx is elepidote but covered in small hairs, which along with its white rather than cream flowers distinguishes it from *R. dalhousiae*. This is one of the most spectacular *Maddenia* and is widely grown in gardens in milder areas, with some forms hardier than others. Like many epiphytes, it tends to have a small root system, so is often staked.



R. lindleyi. Photo: Everard Daniel.



R. megacalyx. Photo: Dr. Stephan Bubert.

R. megacalyx (Epithet: large calyx)

This 1.2-7.5 m (4-25 ft) high, rarely epiphytic, shrub from Upper Myanmar, SE Tibet and NW Yunnan, China. Its leaves have conspicuous sunken veins on their upper surface and are densely lepidote with golden and brownish scales. The petioles have a shallow groove on their upper surface, its elepidote calyx is noticeably large, and is has larger lower flower lobes. Overall, although somewhat tender, it is a fine plant with showy, sweetly-scented flowers, and is generally neater in habit than *R. lindleyi* and *R. nuttallii*. It flowers from April to June.

R. nuttallii (Epithet: after Thomas Nuttall, botanist and traveller)

This larger (1.2-9 m (4-30 ft) species from Bhutan to northern Vietnam has smooth, peeling, purple-black bark and spectacular new growth that is bright-fuchsia to purple in colour with silver scales. It has large leaves (the largest of any lepidote excluding vireyas) that are heavily bullate (puckered) on their upper surface, and very large (to 15 cm (6 in), probably the largest flowers in the genus, fragrant, white to pink tinged flowers with a yellow blotch that are scaly on the outside. It is a spectacular species, but is tender, so typically needs winter freezing protection.



R. nuttallii. Photo: Garth Wedemire.

R. taggianum

This 2-3 m (6.5-10 ft) shrub from SE Tibet to western Vietnam is quite similar to *R. lindleyi*, but differs in its non-hairy but often lepidote margins to the calyx lobes and has both a wider flower and leaves. It is spectacular in flower and is usually fragrant.



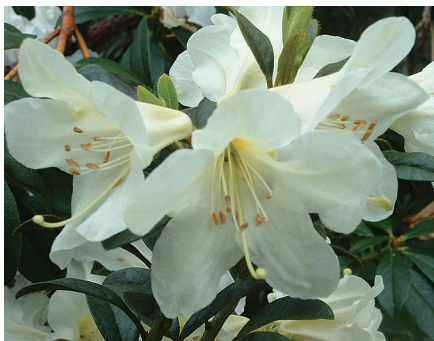
R. taggianum. Photo: Steve Henning.

Group C. (stamens 8-10 (11-13), calyx small)

a) C1 (former *Ciliatum* series and *R. johnstoneanum*): branchlets and calyx bristly, leaf margins and petioles usually ciliate, style impressed (describes how the style joins the ovary – the ovary widens abruptly at the base of the narrow style, as opposed to gradually tapering into it)

R. burmanicum (Epithet: from Burma)

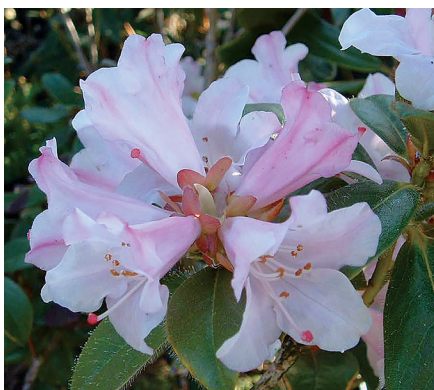
Up to 2 m (6.5 ft) high from central Myanmar, this usually compact shrub is larger leaved and less bristly/hairy than *R. valentinianum*. Its flowers are yellow to cream, and are usually scented, unlike *R. valentinianum*. The true species is rare in cultivation and more tender. Those that are less densely scaly with smaller leaves and deep yellow flowers are likely hybrids (e.g., *R. burmanicum* Cox form).



R. burmanicum. Photo: Everard Daniel.

R. ciliatum (Epithet: fringed)

This small (0.3-1.5 m (1-5 ft) shrub ranges from Nepal to Bhutan and into SE Tibet, and can be identified by hairs on its leaves, leaf margins, petiole and calyx. It blooms from March to May, and its flowers are white, sometimes flushed with pink, which distinguishes it from the yellow flowers of *R. valentinianum* and *R. fletcherianum*, its closest relatives. Different clones vary in both quality and hardiness. Its hybrid progeny include 'Praecox' and 'Cilpinense'.



R. ciliatum. Photo: Everard Daniel.

R. dendricola (Epithet: tree dweller)

Growing to a height of 4.5 m (15 ft) and ranging from SE Tibet and Arunachal Pradesh through Myanmar to Yunnan, this usually fragrant species has white to flushed pink flowers, often with a greenish yellow or orange blotch. It is a variable species, differing from *R. johnstoneanum* in its non-bristly foliage, from *R. walongense* in the absence of calyx hairs and from *R. veitchianum* in an impressed rather



R. dendricola. Photo: Hank Helm.

than tapering style. It is one of the most tender species, but if sheltered, can make a great display.

R. fletcherianum (Epithet: after H.R. Fletcher, Regius Keeper, Royal Botanic Garden, Edinburgh)

Another small species, growing only to 1.2 m (4 ft), this SE Tibetan species occurs in the alpine and forest regions. It has reddish-brown peeling bark, bristly branchlets, a petiole that is flat on its upper surface and winged, and pale yellow flowers. It is hardier than *R. valentinianum* and more free-flowering, is quite a distinctive species, but needs good drainage. Its hybrid progeny include 'Curlew' and 'Patty Bee'.



R. fletcherianum. Photo: Garth Wedemire.

R. johnstoneanum (Epithet: after Mrs. Johnstone, wife of the Political Agent, Manipur, 1882)

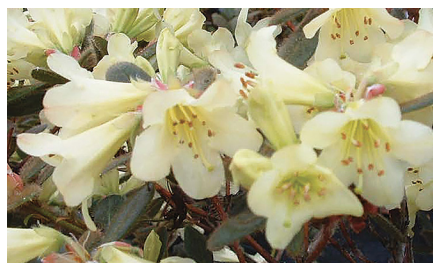
Growing from 1.2-3.7 m (4-12 ft) in NE India, this species has bristly branchlets and (often) leaf margins, white to pale greenish-yellow, often fragrant, flowers, and a very short calyx with long hairs on its margins. It differs from *R. lyi* by its impressed style and more bristly and wider leaves. It is one of the more popular and hardier *Maddenia*, although its double form is more tender.



R. johnstoneanum. Photo: Theo Damen.

R. valentinianum (Epithet: after Pere S.P. Valentin, Tsedjong Mission, China)

Also a smaller plant, this 1.3 m (4 ft) on the NE Myanmar-Yunnan frontier is closely related to *R. fletcherianum*, which has a more upright habit and



R. valentinianum. Photo: Everard Daniel.

larger, rounded leaves, which are less densely scaled on their lower surface. Its flowers are a relatively bright yellow. This species is from a Forrest collection, and it has not been recollected. The literature has sometimes suggested two varieties, *changii* and *oblongilobatum*. However, *R. valentinianum* var. *oblongilobatum* from central Yunnan has now been shown to be in subsection *Boothia*, so that name is no good as it has nothing to do with *R. valentinianum*; it is the distinct species *R. oblongilobatum*. The var. *changii* is from a different area in China and is now also recognized as a distinct subsection *Maddenia* species. All are handsome foliage plants with deep green hairy leaves that require good drainage, and are relatively hardy.

R. changii (Epithet ?)

This is a distinct similar species related to *R. valentinianum* from the Jinpo Shan in Chongqing, Sichuan.

R. valentiniodes (Epithet: like *R. valentinianum*)

This species (see above, as it has sometimes also been referred to as *R. valentinianum* var. *oblongilobatum*) from southern Yunnan may have the deepest yellow flowers seen outside the vireyas in section *Schistanthe*. It is very different from *R. valentinianum* in that it is much larger in all parts, with a much more upright habit and deeply bullate foliage. It also flowers several weeks later than the former. Cox and Cox (1997) suggest it may be related to *R. burmanicum*. There also appears to be another new species, which Steve Hootman is calling *R. valentinioides* aff., which is from the adjacent N Vietnam.



R. changii.



R. valentiniodes. Photo: Hans De Boer.

R. walongense (Epithet ?) (No photo)

This relatively new 2-3 m (6.5-10 ft) species in Arunachal Pradesh has deep, mahogany-coloured bark, creamy white flowers with a greenish blotch and a spicy scent, and is identified by its pubescent corolla and persistent calyx hairs.

b) **C2** (leaves less rugulose and ciliate than those in C1. Impressed style)

R. formosum (Epithet: beautiful)

Growing to three m (ten ft) in NE India, this species has an often bristly petiole, white to flushed pink flowers often with a yellow blotch, and a disc-like calyx, scaly with few hairs. There are two varieties, *formosum* with narrow leaves (to 1.5 cm wide) and *inaequale* with leaves 1.5-5 cm wide. Var. *inaequale* is stronger scented but is the more tender, and is more like *R. horlickianum*, although the latter has no scent. Both varieties need good drainage.

R. leptocladon (Epithet: with thin twigs)

This relatively new small species, 0.5-1 m (2-3.5 ft) tall in southern Yunnan and northern Vietnam has densely scaly branchlets, petioles, and ovary. Its calyx is just a rim, and its flowers are a pale yellow, deeper in the throat. It may be closely related to *R. lyi*.

R. pachypodum (Epithet: thick-footed)

From W Yunnan, this variable species has scaly branchlets, leaves densely scaled on their lower surface, white to rose flowers that are scaly outside and hairy within, flowers from March to May, and a relatively small calyx. It may be much more common in cultivation than realised, as many in gardens may be misidentified as *R. cilicalyx*, which has sparse scales on the outside of the corolla and only on



R. formosum var. *formosum*.
Photo: Garth Wedemire.



R. formosum var. *inaequale*.
Photo: Stephan Bubert.



R. leptocladon. Photo by author.



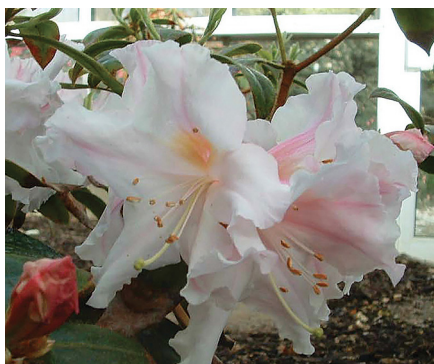
R. pachypodum. Photo: Steve Henning.

the lobes, not the tube. Cox and Cox (1997) suggest both species, along with *R. roseatum*, should probably be merged, as they have overlapping geographical ranges. However, McQuire and Robinson (2009) state their style shapes are different, with *R. ciliicalyx* having a tapered style and *R. pachypodum* an impressed one.

c) **C3** (the Cilicalyx aggregate) (tapered style, small calyx)

R. ciliicalyx (Epithet: fringed calyx)

This 1-3 m (2.5-10 ft) species from W. Yunnan is similar to *R. pachypodum*, as explained above. Its flowers are white to rarely rose with a yellow blotch, and as pointed out, many plants with this name in cultivation may actually be *R. pachypodum*, or even sometimes *R. dendricola*, as the true species is likely rare in cultivation.



R. horlickianum (Epithet: after Sir James Horlick)

Also 1-3 m (2.5-10 ft) in size, this relatively new species from N. Myanmar and adjacent W Yunnan. Its leaves are acuminate (have a long slender point) and its flowers are white to cream, with an orange flare strongly flushed rose, and are both scaly and hairy outside. The calyx is minute and fringed with long bristles. This makes this a fairly distinct species, perhaps most closely related to *R. carneum* (not described here, but see below), which is only known from cultivated plants and may be an extreme form of *R. pachypodum*. The strong pink flushing of *R. horlickianum* makes it attractive, but it is unscented.

R. ciliicalyx subsp. *ciliicalyx*. Photo: Everard Daniel.



R. horlickianum. Photo: Hank Helm.

R. lyi (Epithet: after J. Ly, a Chinese collector)

Only 1-2.4 m (3-8 ft) high, this straggly shrub occurs in Guizhou, Laos, Vietnam and Thailand. It has relatively narrow leaves and is distinguished by its white flowers, sometimes fragrant, with the whole corolla surface slightly scaly; its long style, and a minute calyx densely scaled with a few long hairs.



R. lyi. Photo: Hank Helm.

R. parryae (Epithet: after Mrs. A.D. Parry, wife of an officer in the Assam Civil Service).

This may not be a valid species, as its type herbarium specimen is unlike the named species in cultivation, nor is it similar to *R. roseatum* as has been suggested recently. McQuire and Robinson (2009) suggest it may be distinct, so it is listed here. It is 1.5-3 m (5-10 ft) in size, and is from Assam. It has fragrant, white flowers with a yellow-orange blotch, and flowers from April-May.



R. parryae. Photo: Dennis McKiver.

R. roseatum (Epithet ?)

This species may be just a form of *R. pachypodum*, as except for narrower leaves and occurring naturally further east, it is otherwise indistinguishable. It is also similar to *R. dendricola*, which has a different leaf shape, a smaller calyx and less dense leaf scales on the underside. It's from Yunnan, and has reddish peeling bark and sometimes fragrant, white, flushed pink flowers with a yellow blotch and a shortly lobed calyx with long hairs on its margin. It flowers relatively late in April-May.



R. roseatum. Photo: Hank Helm.

R. veitchianum (*R. cubittii*, now Cubittii Group) (Epithet: after the famous family Nurserymen)

This species is 1-3.7 m (3-12 ft) high, and occurs in Myanmar, Laos and Thailand. The lower surface of its pale green leaves have distant, brown unequal-sized scales, and its relatively large, white, strongly scented flowers often blotched yellow have margins that are typically frilled or wavy. It flowers early, from February to April. This is a spectacular species in terms of flower size, but is very tender and needs winter protection from freezing.



R. veitchianum. Photo: Garth Wedemire.

Additional Species

In the 2019 Glendoick catalog, the following maddenias are found (see the catalog for code explanations):

R. carneum. H2 Med EM-M Pale pink, lightly scented. Rarely offered.

R. crenulatum. H3 Low M Cream flushed yellow or pale pink. Amazing new species from Vietnam/Laos with small leaves. Useful late flowering dwarf.

R. scopulorum CC 7571 Select. H2 Med EM * Pretty, fragrant white flowers with a yellow blotch in April-May. Free-flowering. Small leaves and good habit. The first reintroduction

R. wumingense CGG 14050. New. H2-3 Semi-Dwarf, pure white flowers in pairs. Dwarf, compact. The first introduction. Newly introduced from Guangxi.

In the 2019 RSBG catalog, the following additional maddenias species is listed:

R. pseudociliipes JN#11070. Only recently introduced, this is a rare Maddenian in cultivation. The one or two (per inflorescence) white flushed pink, fragrant flowers, are impressive against the relatively small leaves. Requires excellent drainage. A rarely offered species.

B. Subsection *Boothia* (seven species)

These are small (up to two m (six feet), epiphytic shrubs with leaves whitish below, usually yellow, broadly campanulate (bell-shaped) flowers, a well-developed calyx, ten stamens, and a style that is sharply bent downward at its base. They are all good but tender garden plants that grow best on tree stumps and on mossy, moist substrates.

Group A. (Scales pale, vesicular (bladder-shaped), lacking a rim)

R. leucapsis

R. megeratum

Group B. (Scales darker, not vesicular)

R. boothii

R. chrysodoron

R. dekatanum

R. sulfureum

R. oblongilobatum

Species Details

Group A. (Scales pale, vesicular (bladder-shaped), lacking a rim)

R. leucapsis (Epithet: white shield)

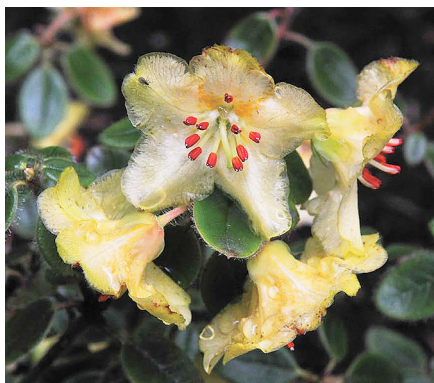
This small, somewhat tender, early flowering shrub 0.3-1.5 m (1-5 ft) high from SE Tibet makes a superb container plant. Each truss has 1-2 white, saucer-shaped flowers with chocolate-brown anthers and purple new growth.

R. megeratum (Epithet: passing lovely)

Another small, somewhat tender shrub 1-1.8 m (3-6 ft) high with one to two broadly campanulate, white to creamy yellow or deep yellow flowers per truss. It ranges from NW Yunnan, NE Myanmar and E Tibet to Assam, India. Both this species and the previous have survived unprotected and in the open for many years at the RSBG in Federal Way, WA.



R. leucapsis. Photo: Herman Van Ree.



R. megeratum. Photo: Susan Lightburn.

Group B. (Scales darker, not vesicular)

R. boothii (Epithet: after T.J Booth, who first collected it in 1849)

This rare, small (1.5-3 m (5-10 ft) tender species has small, bright lemon-yellow or sulphur-yellow flowers for the size of its leaves. It ranges from Assam, India, to SE Tibet. Plants in the Mishmiense Group may be deserving of varietal status.

R. chrysodoron (Epithet: Golden gift, referring to the plant given by Lord Stair to the Royal Botanic Garden, Edinburgh)

This fine but tender plant has among the best-coloured yellow flowers in the genus, being a bright canary yellow. From 0.2-1.8 m (0.6-6 ft) high, it ranges from W Yunnan to Upper Myanmar and flowers from February to April.

R. dekatanum (Epithet: after Mrs. Dekat)

Similar to *R. sulfureum*, this species has only recently been recognised as being in cultivation. This small plant (0.6-1.2 m (2-4 ft)) shrub has bright lemon-yellow flowers from March to April, and has only been found in S Tibet.

R. sulfureum (Epithet: sulphur-coloured)

This species is variable in form and hardiness, being found in NW Yunnan and NE Upper Myanmar. A small shrub (0.3-1.5 m (1-5 ft)) high, it has deep yellow to greenish yellow



R. boothii. Photo: Calvin Parsons.



R. chrysodoron. Photo: Hank Helm.



R. dekatanum. Photo: Garth Wedemire.



R. sulphureum. Photo: Hank Helm.

flowers and flowers in March-April.

Note: the *Boothia* species *R. sulfureum* is also spelt as *R. sulphureum* (the photo). McQuire and Robinson (2009), the ARS Plant Data website, and others use the former, whereas other websites, e.g.,

<https://plants.jstor.org/stable/10.5555/al.ap.specimen.us00116755> use the latter. The American sulfur (in British English, sulphur) seems to be most accepted, and is what is listed by Chamberlain et al. (1996), but both spellings are sometimes used for this species.”

R. oblongilobatum JN#11080 (Epithet ?) (No photo)

The RSF states this is the first introduction into cultivation of the real *R. oblongilobatum*, grown from seed collected in the wild from the type location for this species in central Yunnan. Originally described as a variety of the *valentinianum* complex (incl. *valentinianum*, *changii*, *valentinioides*, etc.) in subsection *Maddenia*, but its flowers have a sharply deflexed style which places it in subsection *Boothia*. It has beautiful, rounded and glossy leaves with hairy margins on dwarf plants, with deep yellow flowers in mid-spring. The RSF states it was previously offered as “*valentinianum* var. *oblongilobatum*” (+5\R2\2) RSBG#213sd2012

B. Subsection *Edgeworthia* (three species)

Plants in this small subsection have both indumentum and scales. The three species do not seem to be closely related, but are grouped because their unique indumentum is made up of dense curled hairs. *R. edgeworthii* is closest to subsection *Maddenia*, while the other two species are nearer to subsections *Boothia* and *Moupinensia*. All are epiphytic in the wild and need exceptional drainage when planted. Their upper leaf surfaces are often bullate (puckered or blistered), the calyx is well-developed, and there are 10 stamens.

R. edgeworthii (Epithet: after H.P. Edgeworth, Bengal Civil Service)

This species is a favourite of rhododendron species collectors because of its attractive leaves, strongly bullate (puckered) on their upper surface and with a dense rust-coloured woolly indumentum on their lower surface. The fragrant flowers are 3.2-7.6 cm (1.3-3 in) long and are white or white-tinged pink or rose. It ranges widely from Nepal into N Vietnam, so plants may vary in hardiness depending on source. In both Sikkim and Yunnan, I have seen it growing high in trees near the snowline (see



R. edgeworthii. Photo: Susan Lightburn.

p. 32), and plants from Yunnan are hardy in my garden to at least -6° C (21° F). Some forms have previously been called *R. bullatum*.

R. pendulum (Epithet: hanging)

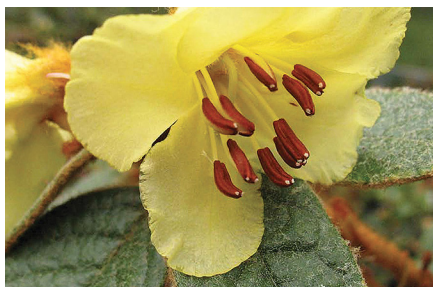
A small unique woolly species growing from 0.3-1.2 m (1-4 ft) on trees and rocks from Nepal to SE Tibet to SE Tibet. It can be tender and difficult to grow. It flowers from April to May and has white to pinkish flowers.



R. pendulum. Photo: Garth Wedemire.

R. seinghkuense (Epithet: from the Seinghku Valley, upper Myanmar)

This small, tender, epiphytic, woolly species is from Upper Myanmar, SE Tibet and NW Yunnan. It has 2-2.5 cm (0.8-1 in) sulphur-yellow flowers in March to April, and has only recently been introduced into cultivation.



R. seinghkuense. Photo: Hank Helm

Acknowledgements

Thanks to Ken Cox and Steve Hootman for their constructive suggestions and edits.

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4. Section *Schistanthe* (vireyas) in the Subgenus *Rhododendron*

(Modified from the Journal American Rhododendron Society 74: Spring 2020)
(images are from www.vireya.net unless otherwise noted)

In the first article here, I discussed first the general characteristics and taxonomic relationships among the main types of rhododendrons in cultivation, i.e., rhododendrons, azaleas, vireyas and maddenia. The largest subgenus in genus *Rhododendron* is *Rhododendron*, which contains all of the lepidote rhododendrons, species that have scales on the underside of their leaves, and the largest section in that is *Schistanthe*, which includes all the vireyas. This is the biggest section in the genus with over 300 diverse species, and the way its species have been taxonomically grouped is still being debated. Argent (2015) considered all vireyas to be in subgenus *Vireya*, not subgenus *Rhododendron*, and has proposed unique groupings of species, but his classification system is not accepted by many researchers, including myself. Within section *Schistanthe*, there is presently no widely accepted groupings of species, and recent studies (Craven *et al.* 2011, Goetch *et al.* 2011) and ongoing work in nuclear gene sequencing is resulting in significant new understanding and revisions as more and more species are studied. I have therefore decided not to discuss any further taxonomic relationships among vireya species in this article. Instead, because most ARS members are unfamiliar with vireyas and to encourage them to try growing vireyas, I will present a selection of species in subsection *Schistanthe* grouped by their relative availability, ease of culture and some of their visual features, namely 1) the more hardy vireyas, 2) the more fragrant vireyas, 3) very floriferous or large truss vireyas for garden culture, 4) tiny vireyas for pot culture and for those with limited space, 5) trailing vireyas for hanging pot culture, 6) warm climate species for places like Florida, southern California, etc., and 7) vireyas with unusual corollas (colour, shape, size) or leaves (shape, size and rugosity). I suggest this will be more useful to most readers not already very familiar with the wide diversity of vireya species.

First though, I would like to summarise some of the reasons why vireyas are worth growing, and what their cultural requirements are for those ARS members that are still unfamiliar with this group of rhododendrons. Chaikin (1994) stated:

“Vireyas may look like rhododendrons, and botanists may classify them as rhododendrons, but they are really [orchid-like], culturally speaking, ... [and] can even be planted in an orchid mix. ... However you look at them, the novice should not conclude that vireyas can be grown in the same fashion as other rhododendrons.” However, this generalization also does not mean to imply that they can be grown like the tropical orchids many of us are familiar with, such as phalaenopsis, cattleyas, etc. Along with the *Asteraceae*, the *Orchidaceae* is one of the two largest families of flowering plants, having about 28,000 currently accepted species, distributed in about 763 genera. In contrast, the *Ericaceae*, while large, is much smaller with only about 4250 known species spread across 124 genera, including about 1000+ rhododendron species. The cultural requirements between many orchids thus varies greatly, and so Chaikin (1994) should perhaps have stated more clearly that vireyas, which mostly come from higher elevation in tropical mountainous areas, prefer conditions only like those of the cooler growing orchids, such as cymbidiums, coelogyne and some dendrobiums. If grown in the same microhabitat preferred by tropical, lower elevation, heat tolerant orchids, which most of us likely think of when we think of orchids, i.e., in relatively closed, seasonally warm to hot greenhouses, most vireyas will die. Most vireyas to survive need cool temperatures but to be kept above freezing, and so on Vancouver Island, Canada, where I live, I keep my many vireyas outside from March to November, but move them into greenhouses with minimal heat (heaters come on at 3° C (37° F)) during the other months. I really only need to do so for the few weeks of subzero temperatures we have during the winter, but I have too many plants to move them in and out just when freezing occurs, so I bring them all into my greenhouses for the entire winter. Vireyas can be kept in greenhouses throughout the year if the greenhouses are kept cool during very hot days, such as at the Rhododendron Species Botanical Garden (RSBG) in Federal Way, WA.

Some articles (e.g., Cavender 1993) have suggested that overwatering of vireyas is the major mistake many people make, and that they should be allowed to dry out between waterings. As epiphytes, many are adapted to feast or famine in regards to water and fertilizer, but more importantly, they need a fast draining medium to grow in.

Bertelmann (2009) emphasized: “Vireyas must have good media drainage and air in the medium. Orchid growers treat their vireyas generally like their orchids, and besides the medium, vireyas want bright light, but not necessarily full sunlight, and like orchids, vireyas don’t mind being pot tight...but, there is a difference in being pot tight and being root bound. Vireyas have a fine root system with a few larger “carrot” roots but no taproot. The fine roots can form a solid barrier in their pots preventing proper water absorption and leading to stress. Vireyas respond to transplanting very well and love having their roots loosened

or trimmed. However, when you prune the roots, be sure to prune the branches of your vireya too, which helps it to recover more quickly from the root rotting and produces a denser plant that will cover itself with blooms. I suggest keeping your plant regularly watered. One of the lessons learned from growing vireyas in Hilo, Hawaii, is they love water, just not soggy feet. In other words, it's not how much water but how quickly the water runs through the medium that is important. I know, we've all heard we should water heavily and allow the vireya to dry out well before re-watering. Well, Hilo is the rainiest city in the USA and it is not unusual to have a solid month of rain. The vireyas absolutely love it! This has led us to rethink our watering. Keeping the vireya slightly moistened at all times works better than letting it swing between very dry to very wet—far less stressful to the plant...

Go sparingly with your fertilizer. Time release with trace elements, fish emulsion, rhododendron fertilizers, chicken manure are all things vireyas love, sparingly. Half to one third of the recommend application is fine. Vireya's favorite fertilizer seems to be a good old organic mulch around its roots, even in a pot if it is kept outside in the elements. There are too many appropriate [but often region-specific recipes] for rhododendron medium to discuss here, but I want to mention one though: cactus mixes. Believe it or not, vireyas will grow in these media because it tends to have exceptional drainage and aeration."

I follow Bertelmann's (2009) watering schedule here on Vancouver Island. I lightly spray my vireyas daily each day in the afternoon when outside, simulating mountain clouds and rains, and with my media (peat/coir and 60% perlite in an open sleeve) and in my mild climate, my vireyas are surviving well. So, if in the right quick-draining media, frequent watering is not necessarily bad.

Osborn (1969) stated:

"The incredible variability [in the cultural requirements of many vireyas] carries over from the varied ecological niches they may come from. Species originally found growing epiphytically in pure organic debris have been reported to be able to aggressively colonize barren clay left from gold mining operations at Edie Creek, Papua New Guinea. *R. inconspicuum* is reported to be at home both in mossy forests and on limestone ridges. Some species grow only on hot rock faces, whereas the gaudy, almost too bright yellow *R. laetum* is a swamp plant. Clearly, most generalizations about [vireya] growing practices will be subject to exception."

Often if one experiments, cultural success can be had with many different cultural media and watering patterns. Even in Hawaii and California, the best North American climates to grow vireyas outside, there are many places where vireyas don't do well, or will do well (e.g., for the latter, around Hilo, Hawaii, and the San Francisco Bay area in California).

Vireyas are also quite happy in small pots, since as epiphytes, they are used to a restricted root run. Cavender (1993) stated:

“My parent plant of *R. lochiaie* × *R. culminicola* is in a ten-inch (25 cm) basket and is over three feet (91 cm) in diameter. The absolute worst thing you can do to a vireya is put it in a big pot and water it every day! I prefer hanging planters rather than baskets. Hanging planters have a well inside the bottom of the container rather than a saucer on the outside. This helps to slow run-off. My soil mix ranges from pumice, bark, peat to pure coarse bark. Peter’s 20-20-20 or Fish Fertilizer once a month is fine. We hang vireyas in the same conditions that fuchsias enjoy, the north or east side of the house. We take ours into the greenhouse in the winter. Vireyas will not tolerate freezing but they don’t require lots of heat either! I run my greenhouse [in the winter] at about 40° F (4.4° C) and they do fine. It has been my experience that the average home [with central heating] is too dry for vireyas to flourish. They need more humidity! If without a greenhouse, then plant rooms, spa or hot tub rooms, etc., work well. Remember, vireyas will bloom in the winter as well, so don’t hide them away. The thing to remember is that vireyas are rhododendrons! All will thrive if given conditions they like, and the same general rules apply to vireyas as to hardy rhododendrons.

Vireyas are distinguished botanically from other rhododendrons by having seed with two long tails, and enthusiasts soon find that the seed is also distinguished by retaining its viability for only a short time. Most vireyas occur where the growing season is continuous, with the seed germinating as soon as it falls, unlike rhododendrons of temperate climates whose seed must maintain their viability through the winter. Once vireya seed is more than a couple of months old, little if any germination can be expected.”

With respect now to the higher level of rhododendron taxonomy, cladistics is the systematic classification of groups of organisms into clades on the basis of shared characteristics thought to derive from a common ancestor (Nelson 2021), and here again is a brief review of the taxonomic relationships of *Schistanthe* in the genus *Rhododendron*:

Genus *Rhododendron*

Clade A

Subgenus *Rhododendron*: Small leaf or lepidotes (have scales on the underside of their leaves). Three sections, about 506 species.

Subgenus *Choniastrum*: Eleven species.

Clade B

Subgenus *Hymenanthes*: Large leaf or elepidotes , including most deciduous azaleas. Two sections, with about 311 species.

Clade C

Subgenus *Azaleastrum*: Nearly everything else, most notably deciduous azaleas such as *R. schlippenbachii* and many evergreen azalea species from northeast Asia. Three sections, about 90 species

Subgenus *Rhododendron*

- 1) Section *Pogonanthum* (six species)
- 2) Section *Rhododendron* (28 subsections, 200 species)
- 3) Section *Schistanthe* (vireyas, 300+ species)

The vireyas described below are listed in alphabetical order within each feature grouping. Information is from Argent (2015), Chris Callard's www.vireya.net, and the RSBG website rhodygarden.org. There is a wealth of information at www.vireya.net, as it also contains an archive of most of the relevant vireya literature and has advice on how to grow vireyas.

Vireya Groupings and the Selected Species Discussed:

- 1) **more hardy vireyas:** *R. commonae*, *R. kawakamii*, and *R. saxifragoides*. Also *R. densifolium*, *R. rushforthii*, *R. sororium*, and all the other species from Vietnam."
- 2) **more fragrant vireyas:** *R. armitii*, *R. dianthosmum*, *R. goodenoughii*, *R. herzogii*, *R. jasmiflorum*, *R. konori*, *R. leucogigas*, *R. loranthiflorum*, *R. suaveolens*, *R. superbum*.
- 3) **very floriferous or large truss vireyas for garden culture:** *R. goodenoughii*, *R. konori*, *R. leucogigas*, *R. loranthiflorum*, *R. superbum*, *R. zoelleri*.
- 4) **tiny vireyas for pot culture those with limited space:** *R. anagalliflorum*, *R. acrophilum*, *R. burttii*, *R. gracilentum*, *R. rubineiflorum*, *R. wormersleyi*, *R. wrightianum*.

- 5) **trailing vireyas for hanging pots culture:** *R. anagalliflorum*, *R. caliginis*, *R. christi*, *R. jasminiflorum* var. *punctatum*, *R. pauciflorum*, *R. rarum*, *R. virosum*.
- 6) **warm climate species for places like Florida, southern California, etc.:** *R. christiana*, *R. densifolium*, *R. javanicum*, *R. laetum*, *R. longiflorum*, *R. loranthiflorum*, *R. macgregoriae*, *R. malayanum*, *R. nieuwenhuisii*, *R. zoelleri*.
- 7) **vireyas with unusual corollas (colour, shape, size) or leaves:** *R. ericoides*, *R. herzogii*, *R. himantodes*, *R. praetervisum*, *R. stenophyllum*, *R. taxifolium*, *R. rugosum*, *R. tuba*.

Species Details by Grouping:

1) The more hardy vireyas.

R. commonae (Epithet: after the entomologist Arnold Foerster's wife)

This species from 1800-4000 m (5900-13,000 ft) in both Indonesia and Papua New Guinea occurs in terrestrial grassland at the edge of *Papuacedrus* (conifer family *Cupressaceae*) forests and on ridge crests, where it flowers freely throughout the year. It sometimes forms a thick woody basal burl from which numerous shoots can arise from dormant buds there that



R. commonae. Photo: C. Callard.

allows it to regenerate after the upper stems have been destroyed from freezing or fire. Its crenulated leaf margins are quite distinctive. Flowers in cultivars in cultivation can be bright red, pink or a very pale yellow. It grows and flowers easily but irregularly several times a year, forming nice rounded clumps. Gerdemann (2005) suggested that this species might have a hardiness rating to approximately 20° F (-7° C). In his garden, the form of *R. commonae* from the Laiagam Garden in Enga, Papua New Guinea, survived 10° F (-12° C), although it died to the ground and only its stem portions below ground that were protected by fallen leaves lived.

R. densifolium (Epithet: dense leaf)

This shrub to 1.3 m (4.25 f) from 1000-1800 m (3280-5900 ft) from southern China and Vietnam has twigs to 1.5 mm (0.06 inches) diameter and 7-15 small leaves in loose pseudowhorls (a circle of leaves, but with the leaves emerging from separate axils (the junction of leaf and stem)). Its smallish yellow flowers are mostly solitary, occasionally paired, semi-erect to half-hanging, and in cultivation it can flower irregularly throughout the year. It grows easily in cultivation and is a dainty plant.

R. kawakamii (Epithet: after Takiya Kawakami, a Japanese collector in Taiwan)

This shrub to 1.5 m (five ft) from sub-montane, humid forests in Taiwan occurs epiphytically on the trunks of Taiwan cypress (*Chamecyparis formosensis*) or terrestrially in open areas from 1400-2600 m (4600-8530 ft) elevation. It grows easily, flowering once a year, with three to seven bright but small yellow flowers occurring in an umbel (an inflorescence that consists of a number of short flower

stalks) from June to July. It is relatively hardy, and Argent (2015) reported that it has been growing successfully outside without protection in Edinburgh, Scotland, although it is likely to die under extreme conditions when they occasionally occur, such as -11° C (12° F) in December 2009 and -16° C (3° F) in December 2010. Edinburgh is periodically exposed to cold waves, and is often the coldest city in the UK. Its average winter temperature is above freezing even at night, although light frosts occur quite often. Gerdemann (2005) reported that in his garden on the central Oregon coast, it has grown well for twenty-three years, surviving temperatures below freezing for extended periods, and only suffering minor injury when exposed to 10° F (-12° C).



R. densifolium. Photo: L. Muir.



R. kawakamii. Photo: F. Miller.

R. rushforthii (Epithet: after Keith Rushforth, its collector)

This Vietnamese species can grow to 1.5 m (five ft) and is distinctive in having blueish-green leaves that are much larger than its closer relatives, such as *R. kawakamii*, to which it has many similarities. However, it does differ in having a hairy and scaly ovary, a hairy style and unusually, flower bud scales that are fringed with both hairs and scales. It has attractive bright yellow flowers, which with its blueish-green leaves makes it very attractive. It only flowers once a year, and while it suffers from higher temperatures, in the UK it has survived at -8° C (18° F).



R. rushforthii. Photo: Tony Conlon.

R. saxifragoides (Epithet: Like *Saxifraga* because of its tussock-forming habit)

This dwarf species to 15 cm (6 inches) from 3225-4000 m (5900-13,000 ft), the highest elevation that any vireya grows, in both Indonesia and Papua New Guinea. It forms tussocks, i.e., mats up to one m (three feet) in diameter, with subterranean spreading woody branches and only very short, thick twigs above ground. In cultivation, they can grow horizontal branches up to 80 cm (32 inches), which in the wild in a bog would become buried. It is the only species to have stomata on both sides of its leaves, and has erect seed capsules when they mature. Its flowers are solitary, or rarely in twos, and are pink to red. It grows slowly, flowers intermittently and has flowers raised well its foliage. It is relatively difficult to grow, but it has been used in a number of more easily-grown hybrids, particularly by Os Blumhardt in NZ, with registered names prefixed by the word 'Saxon'. 'Saxon Blush' and 'Saxon Glow' are presently being used in commercial production in Europe (see Puddy and Ciarrocchi 2019).



R. saxifragoides. Photo: C. Callard.

R. sororium (Epithet: Latin, from soror = sister, presumably referring to its closely related species) (No photo)

This is a new introduction into cultivation by the RSBG. These are dwarf epiphytic evergreen shrubs with thick and leathery, elliptic to oblong leaves. This shrub has smooth twigs about 2 mm (0.08 in) in diameter and leaves arranged up to five together in pseudowhorls. Its yellow flowers, bell-shaped with widely flaring lobes, are solitary or rarely in pairs, and are outside densely scaly, as is the bright pedicel. Overall, it is quite similar to *R. emarginatum*, which has rougher twigs, a slightly shorter corolla, a thinner pedicel and smaller leaves. This is one of several closely related taxa newly introduced from S Yunnan and adjacent N Vietnam. Many of these have only recently been described as new species by Chinese botanists. This species is visually distinguished from its close relatives by its very large leaves. Quite hardy for a vireya – our largest-leaved form, and suggested by the RSBG to be tolerant to about -12° C (10° F).

2) Some of the more fragrant vireyas

R. armitii (Epithet: after William Edington de Margrat Armit, a Belgian officer of the Queensland mounted police, who led an expedition to Papua where this species was first collected).

This small shrub to two m (6.5 ft) is from both the central and northern districts in Papua New Guinea and Goodenough Island. Larger plants in particular are covered in delicate pinkish-white scented tubular flowers, often in mid-winter. They will however flower at almost any time of year, and will begin flowering on smaller plants. Flowers are either straight or slightly upwardly curled and are five to seven in an open, one-sided umbel, held either horizontally or half-hanging.



R. armitii. Photo: H. Helm.

R. dianthosmum (Epithet: after Dianthus, as the flowers have a similar carnation perfume)

This species from Papua, Indonesia, grows to two m (6.5 ft) in the wild, and in cultivation, is slow growing and relatively compact. Its three to six flowers per umbel are white to pink with darker pink edges, with a scent of



R. dianthosmum. Photo: Bovees Nursery.

carnations. Its beautiful, strongly scented flowers are just produced once a year, in late summer in Scotland.

R. goodenoughii (Epithet: after Goodenough Island, Papua New Guinea), which was named after Commodore Goodenough, a British naval sea captain)

This species is a strong grower, to four m (13 ft) in the wild, and was introduced into cultivation in the late 1960s. It flowers prolifically at least once a year, and its 8-22 white, sweetly scented flowers in each umbel are first held semi-erect in a tight cluster by the collarette of bracts, which later spread and fall away, allowing the umbel to open up with the flowers becoming horizontal. This is quite distinctive, and the beautiful fragrance makes this a very desirable species.



R. goodenoughii. Photo: R. Currie.

R. herzogii (Epithet: after Th. Herzog, a missionary in the Finisterre Mountains in New Guinea)

This erect shrub to two m (6.5 ft) from Papua New Guinea is a popular, relatively free-flowering species with resinously aromatic foliage and beautifully scented white or pink-flushed flowers. Its five to ten flowers per umbel are held stiffly semi-erect and curve outwards. There are two varieties, *herzogii* from the eastern end of its range and *occidentale* from the western end, with the latter having much shorter, straighter flowers and a broader corolla tube mouth in proportion to the length of the tube (5-6 times, versus 8-16 times for var. *herzogii*). However, Argent (2015) reports that Frédéric Danet observed this may instead be because of different pollinators in open and forested areas, i.e., where the plants occur in different microhabitats, rather than the result of a clinal geographical transition.



R. herzogii. Photo: C. Callard.

R. jasmminiflorum (Epithet: scented flowers like that of *Jasminum*)

This shrub to 2.5 m (8.25 feet) from the Malaysian Peninsula has six subspecies, based on leaf size, hairs on the corolla, and the number of flowers in the umbel (truss). Subspecies *jasmminiflorum* var. *punctatum* is the most cultivated one, with 5-15 white or flushed with pink, scented, trumpet-shaped flowers per truss. In cultivation since 1845, it is a magnificent species that grows and flowers easily, mostly once a year from December through February, but it can be in flower in any month. It is extremely fragrant, and in a pot, can be easily kept to a height of about 45 cm (18 inches).



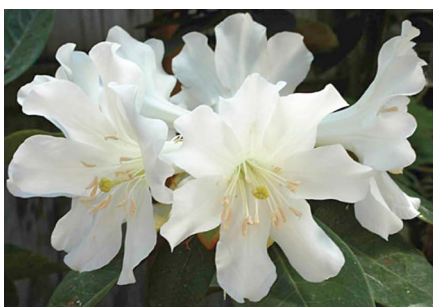
R. jasmminiflorum. Photo: C. Callard

R. konori (Epithet: named after a god or semi-mythical leader of the Hattam people in New Guinea)

This shrub or small tree to six m (20 ft) occurs throughout the main mountain ranges of New Guinea, and also from Ferguson Island, New Britain and New Ireland in Papua New Guinea. Like *R. superbum*, it performs well in cultivation with its large white to pale pink, powerfully scented flowers. It has four to ten, 19 x 15 cm (7.5 x 6.5 inch) flowers per umbel, and its flowers often have pink spots at the bases of the lobes. Being a bit too large for good pot culture, it grows best in the ground, but in cultivation, its flowers, while still huge, are always smaller than those seen in the wild. It naturally hybridizes around the Anggi Lakes with *R. asperum*, producing plants with smaller corollas. There are two varieties, the larger *konori* and the smaller in all its parts *phaeopeplum*, with the latter possibly a natural hybrid with another species, which grows well with lovely pink perfumed flowers and is more suitable for pot culture.



R. konori 'White Giant'. Photo: R. Currie.



R. konori var. *konori* (West New Guinea form). Photo: R. Currie.

R. leucogigas (Epithet: white giant, alluding to its enormous flowers).

This erect shrub to three m (ten ft) from the Cycloop Mountains in Papua, Indonesia, is epiphytic on tree trunks in riverine forests. Its five to eight strongly scented flowers per umbel are held semi-erect to half-hanging, are white with pale pink on the tube and at the junction of the lobes, and are about 14 cm (5.5 inches) long. Although it grows relatively slowly and flowers best every other year in cultivation, it is so spectacular when it does flower that it is highly sought for, and has become the parent of many spectacular hybrids that grow with hybrid vigour, making them easier, quicker and much more floriferous than the parent species.

R. loranthiflorum (Epithet: with flowers like *Loranthus* (parasitic plants in the showy mistletoe family Loranthaceae)

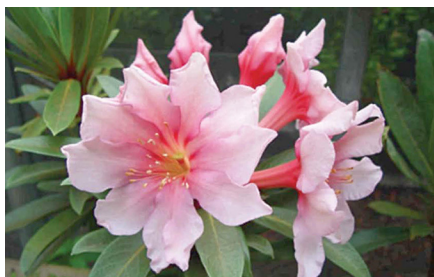
This epiphytic shrub to three m (ten ft) is from mountain tops in the north-eastern islands (Goodenough, New Britain, Bougainville, etc.) of Papua New Guinea. It is wonderfully floriferous and plants are covered in masses of white flowers, often in late winter. Trusses consist of three to seven flowers, held either semi-erect to half-hanging. Plants from Mt Veve, Bougainville Island, are scented, most strongly at night, but lose their fragrance during the day.

R. suaveolens (Epithet: sweetly smelling)

This very attractive and distinctive



R. leucogigas. Photo: C. Callard



R. leucogigas. Photo: C. Callard



R. loranthiflorum. C. Callard.



R. suaveolens. Photo: R. Mitchell.

epiphytic and terrestrial species to three m (ten ft) from Borneo has long, white to flushed pink, usually scented flowers with pale green leaves that have the main vein predominantly dark red in at least the broad basal part. Somewhat similar to *R. orbiculatum*, it has however narrower flowers with a smaller corolla lobe, many more flowers (12-25) in a strong umbel and longer leaves. It has been in cultivation since 1966 and grows and flowers well as a cool greenhouse plant in temperate countries, flowering mostly in the winter months. Cultivars from Mt. Kinabalu appear to always have a strong scent, whereas those from Mt. Lotung have no scent.

R. superbum (Epithet: superb)

This is a stiff shrub that can grow to six m (20 ft) in the wild in the Central Ranges of Papua New Guinea. It is easy to cultivate and usually flowers in April or May, and while it will flower when young, it does so most freely when established and fairly large in size, when it gives an exquisite display with its large, powerfully scented



R. superbum. Photo: R. Currie.,

flowers. Its three to six trumpet-shaped flowers per umbel are huge, up to 14 x 12 cm (5.5 x 4.5 inches), are fleshy or waxy in texture, and are white to very light yellow, sometimes flushed with pink, shading to deep pink. It is generally epiphytic on the upper branches of large trees just below the true moss forest level. It hybridizes naturally with *R. hellwigii* where the species distributions overlap, and all really pink forms may be natural hybrids. Argent (2015) describes a subspecies *ibele* from the Ibele Valley that has a shorter corolla tube, but apart from some other minor differences is otherwise quite similar.

3) very floriferous or large truss vireyas for garden culture

R. konori (see (2) above)

R. leucogigas (see (2) above)

R. loranthiflorum (see (2) above)

R. superbum (see (2) above)

R. zoelleri (Epithet: after Hugo Zöller, who led the first expedition to the Finisterre Mountains in New Guinea in 1891)

This shrub to three m (ten ft) occurs throughout the mainland of New Guinea as both an epiphyte or terrestrial in a variety of habitats from sea level to 2000 m (6560 ft). Its four to eight nine cm (3.5 in) flowers are in a complete or slightly open

umbel, and usually have a yellow tube and broad orange to reddish margins to the lobes, so that it appears the flower has a “yellow star” in its throat. In the wild, flowers are often visited by butterflies of the genera *Ornithoptera* and *Papilio*. With its large flamboyant flowers, it is one of the most popular New Guinea rhododendrons in cultivation, and because of its low elevation in the wild, requires more heat than the majority of vireyas. As



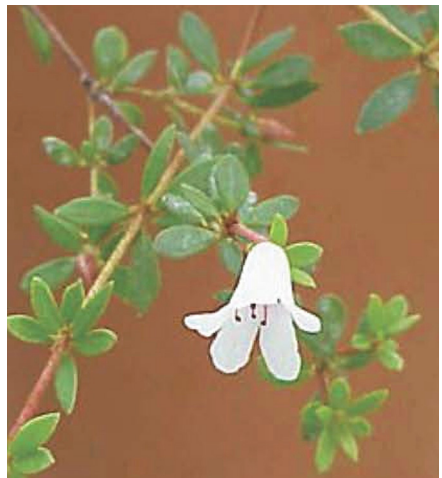
R. zoelleri. Photo: C. Callard.

a result, it is one of the main parents of the many heat tolerant hybrid vireyas produced in Queensland which are successful garden plants there. These hybrids are also popular in California, where they can bloom from seed in three to four years.

4) tiny vireyas for pot culture for those with limited space

R. anagalliflorum (Epithet: with flowers like *Anagallis* (pimpernel, *Primulaceae*))

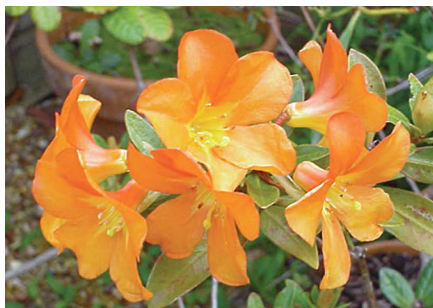
A dwarf prostrate or creeping plant to 15 cm (six inches) from Papua, Indonesia, and Papua New Guinea with very slender twigs (0.5-0.7 mm) with 3-5 leaves together in tight pseudowhorls at the upper 3-4 nodes. Its white flushed with reddish purple near the base flowers are solitary, half-hanging to hanging. It grows well as a delicate alpine and flowers continuously when established. It is sometimes confused with *R. rubineiflorum* (see below) when not in flower, and like that species, is used successfully in hybridizing, particularly for trailing hybrids suitable for hanging baskets.



R. anagalliflorum. Photo: C. Callard.

R. acrophilum (Epithet: summit loving, although not apt!)

This shrub to one m (3.25 ft) from the Philippines, initially described in error from the top of Mt. Mantalinajan because of confusion with *R. madulidii* (which has white flowers), has twigs 1-2 mm (0.04-0.08 inches) in diameter and three to five mostly horizontal or half-hanging, unscented, usually bicolour flowers with a yellow tube and orange lobes 25 x 50 mm (1 x 2 inches) in size. It is great in cultivation, first flowering at 15 cm (six inches), with a compact habitat, bright green leaves and freely produced flowers. It flowers irregularly at least twice a year, with deadheading encouraging new bud formation. Low temperatures induce the most intense bicoloured or orange flowers, whereas higher temperatures lead to pure yellow flowers from the same cultivar.



R. acrophilum. Photo: C. Callard.

R. burttii (Epithet: after B.L. Burtt, Edinburgh botanist who first collected the species)

This tiny species from Borneo grows to 80 cm (32 inches) in the wild, is smaller in cultivation, and has usually solitary or paired, hairy, red hanging flowers with small, 10 mm (0.5 inch) wide leaves that have only a few small scales. The flower pedicels are quite long, allowing the flowers to hang freely vertically downwards. It is quite attractive, and flowers freely but irregularly up to eight times per year.



R. burttii. Photo: C. Callard.

R. gracilentum (Epithet: slender, alluding to the delicate habit of the plant)

This is an erect or prostrate shrub to 60 cm (24 inches) from Papua New Guinea with very tiny twigs (1-1.5 mm in diameter) and mostly solitary, hanging, unscented, red or pink



R. gracilentum. Photo: C. Callard.

cylindrical flowers and small leaves. It is widely grown, and forms compact, slow growing plants which cover themselves in flowers, mostly just once per year in May or June. It has been used for hybridizing, and its compact form, small leaves and relatively large flowers make it an attractive parent.

R. rubineiflorum (Epithet: ruby-red flowers)

A low shrub to 20 cm (eight inches, usually much less) from both Papua, Indonesia, and Papua New Guinea where it is epiphytic or at the base of trees, it has very tiny twigs (0.75-1.5 mm in diameter) and solitary or occasionally paired, horizontal of half-hanging red or pink flowers. Like *R. gracilentum*, this species is now widely cultivated and used in hybridizing. It too has for its size very large bright red flowers that contrast with its small leaves and delicate habit, and is easily grown. It is sometimes confused with *R. anagalliflorum*, but differs because of its greater vigour, longer internodes (up to four cm (1.5 inches), 2.5 cm (one inch) in the latter), and different flower features, most notably colour.



R. rubineiflorum. Photo: R. Currie.

R. wormersleyi (Epithet: after John Wormersley, Chief of Division of Botany in Lae, Papua New Guinea, and collector of the species)

This erect shrub to two m (6.5 ft) in the wild from Papua New Guinea grows mostly terrestrial in mossy forest or in grassland at 3200-3960 m (10,500-13,000 feet) elevation. It has very tiny twigs (1-2 mm in diameter) and very tiny leaves spirally arranged along the upper part of twigs and one to four hanging bright or deep red flowers per umbel. The species is slightly fickle and being an alpine plant, is prone to sudden death if the temperature gets too high, but otherwise a pretty species with a good erect habit.



R. wormersleyi. Photo: Bovees Nursery.



R. wormersleyi. Photo: R. Currie.,

R. wrightianum (Epithet: after C.H. Wright, assistant keeper of the Kew Herbarium)

This shrub to one m (3.25 ft) from Papua, Indonesia, and Papua New Guinea has 3-5 leaves together in tight pseudowhorls and 1-4 red, pink and rarely white flowers per umbel hanging vertically. It is epiphytic in mossy forest or terrestrial in sandy or peaty soil at 1370-3250 m (4500-10,660 feet) elevation, and is rare in cultivation.



R. wrightianum. Photo: C. Callard.

5) trailing vireyas for hanging pot culture

R. anagalliflorum (see (4) above)

R. caliginis (Epithet: mist or fog, the climate in which this species seems to be perpetually found)

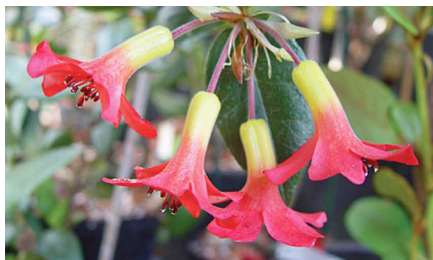
This straggling, many branched shrub to 50 cm (20 inches) from Papua, Indonesia, and Papua New Guinea has very tiny twigs (1-2 mm) and 4-7 leaves together in tight pseudowhorls, often noticeably different in size in the same pseudowhorl. Its 1-2 unscented, white to pale pink flowers are a little curved and hang vertically. This is a striking dainty species owing to its linear leaves which are densely covered with dark brown, dendroid scales when the leaves are immature, remaining underneath when they mature. A pink form in cultivation is probably a hybrid.



R. caliginis. Photo: C. Callard.

R. christi (Epithet: after Konrad H. Christ, a Swiss fern botanist from Basel)

From Papua, Indonesia, and Papua New Guinea, this 1.2 m (4 feet) mostly epiphytic shrub has very tiny twigs (1.5-2 mm in diameter) and has been in culture since the 1940s. It has



R. christi. Photo: Bovees Nursery.

3-4 sub-sessile leaves together in tight pseudowhorls at the upper 2-3 nodes. It flowers at irregular times and its inflorescence is an open umbel of 2-5 flowers with a bicoloured corolla: a yellow tube with reddish-orange lobes, which look very attractive against its dark green, glossy foliage. There are two forms – a large-leaved one and a small-leaved one, and in cultivation, it tends to be sprawling, great for a hanging basket or on a block of tree fern.

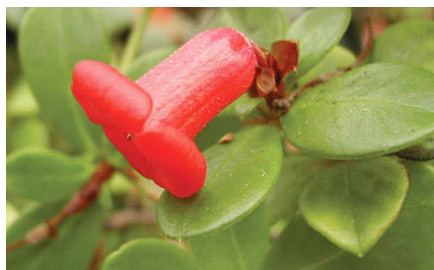
R. jasminiflorum* var. *punctatum
(see (2) above)

R. pauciflorum (Epithet: few flowers)

This shrub to two m (6.5 feet) from the Malaysian Peninsula has very tiny twigs (1-2 mm in diameter), obovate to almost circular dark to light green leaves that are a little shiny above, and solitary or sometimes paired dark pink to red flowers. There sometimes appears to be up to five together due to the simultaneous opening of lateral buds. This species makes a great plant for a hanging basket, being very floriferous and compact. A specimen grown by Dick Cavender in Oregon trailed well over a metre (3.25 feet) from a hanging basket and was reported (Argent 2015) to be in continuous flower over a seven-year period!



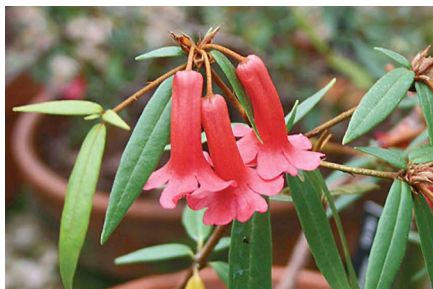
R. pauciflorum. Photo: C. Callard.



R. pauciflorum. Photo: H. Helm.

R. rarum (Epithet: rare)

This slender, much-branched shrub to 1.5 m has very tiny twigs (1-2 mm diameter) from Papua, Indonesia, and Papua New Guinea and 2-5 leaves in pseudowhorls, which are often very different in size in the same whorl, with very small leaves between larger ones. Its pink to dark red flowers are solitary or paired, and it flowers freely several times a year. It is an elegant, easy and resilient grower, and has been used extensively in hybridizing.

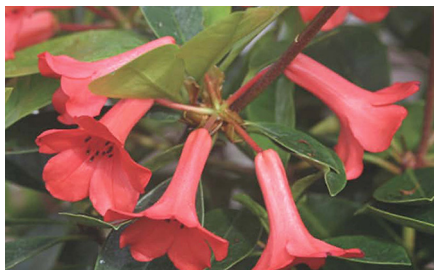


R. rarum. Photo: C. Callard.

R. virosum (Epithet: robust or strong, because of its dominant qualities when used in hybridizing)

This shrub to 1.5 m (five feet) in cultivation has twigs two mm in diameter and is one of two species from mountains in northern Queensland, Australia, the other being *R. lochiaie*, which is both a larger plant and a more vigorous grower. It has 2-6

leaves together in tight pseudowhorls, and 6-12 red to deep pink, half-hanging to hanging flowers in an open umbel. The main flowering season is July in the Northern Hemisphere, February and March in the Southern, and is more strictly seasonal than the majority of vireyas. It flowers when quite young and does not grow rapidly into a large plant. Its red flowers have a tough texture, both of which are dominant in its hybrids, making its progeny's flowers resilient and long-lasting. The similar *R. lochiaie* is also the only vireya to have been reliably crossed between section *Rhododendron* and section *Schistanthe* [previously called *Vireya*] (*R. lochiaie* × *R. virgatum* (section *Rhododendron*, only species in subsection *Virgata*), Rouse and Blumhardt 1991), although the hybrid 'Little Pioneer' is sterile and is a poor grower. **Note:** Cavender (1993) recommended *R. lochiaie* for pot culture, but since then, *R. virosum* has been recognised, and the latter is likely the plant he referred to.



R. virosum. Photo: C. Callard.

6) warm climate species for places like Florida, southern California, etc.

(The species with “?” have ranges that can extend from sea level to as high as 2750 m (9000 feet), so heat tolerance is greatest for those cultivars collected at lower elevations):

***R. christianae* ?** (Epithet: after Christian Crutwell, the mother of Canon Crutwell, who worked as a missionary in New Guinea for 25 years)

This shrub to 3 m (10 ft) from 600-1525 m (1970-5000 ft) from Papua New Guinea has 2-5 tubular, yellow shading to orange flowers in an open umbel. When in full flower around June, it is compact and a mass of orange that is very conspicuous. Although a



R. christianae. Photo: R. Currie.

bit lanky in cultivation, it has good heat tolerance and is the parent of many hybrids. The best forms have a strong orange blush to the lobes and a yellow tube.

***R. javanicum* ?** (Epithet: after Java, the island on which it was first collected)

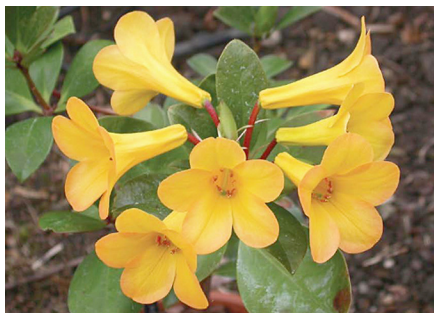
This species from sea level to 2500 m (8400 ft) from Sumatra, Java and Bali has ten subspecies, with the complex being mainly low altitude forest epiphytes that are characterised by large, elliptic, acutely pointed leaves and large funnel-shaped flowers in a range of colours (red, orange, yellow, yellowish-cream and some bicoloured). Some subspecies, like subsp. *javanicum*, bloom all through the year, with a preference for the dry season, and it has orange flowers with red or violet markings at the mouth, grows and flowers well, and has a better shape than most of the other subspecies. Subsp. *brookeanum* has a delicate lemon-like fragrance.



R. javanicum. Photo: R. Currie.,

***R. laetum* ?** (Epithet: cheerful or bright)

This shrub to 3 m (10 ft) from 1800-2300 m (5900-7550 ft) in the Anggi Lakes area in Papua, Indonesia, has broadly funnel-shaped, fleshy, sometimes fragrant flowers that are pure yellow at first, becoming suffused with red or orange with age. It grows well, is one of the best yellow vireyas, and is fairly heat tolerant. It is slightly similar to *R. zoelleri*, differing mainly in the pure yellow of its flowers and shorter petioles.



R. laetum. Photo: C. Callard.

R. longiflorum (Epithet: long flower)

This shrub to 3 m (10 ft) from sea level to 1500 m (4925 ft) is also a widespread species, being found in southern Thailand, Malayasia (Peninsula and Borneo), and Indonesia



R. longiflorum. Photo: C. Callard.

(Sumatra, etc.). It has three to ten horizontal to semi-erect flowers 40-60 mm long (1.6-2.4 inches) per umbel, with flowers orange, pink or red and often with a yellow throat. It was one of the parents of the early “Veitch” hybrids in the 19th century and was also proposed to be one of the main parents by Prof. Holttum in Singapore in his breeding programme for vireyas for lowland tropical gardens (the Japanese invasion of Singapore in World War II stopped this effort). It requires more heat than most vireyas to grow well, has attractive flowers and will bloom repeatedly throughout the year if conditions are right.

R. loranthiflorum (see (2) above)

***R. macgregorae* ?** (Epithet: after Lady MacGregor, wife of the Administrator of New Guinea and Lieutenant Governor of Papua) 359

A common shrub or small tree to 15 m (50 ft) from 120-3000 m (400-9850 ft) from nearly the whole island of New Guinea, with 3-7 leaves in a tight pseudowhorl. It has 5-25 shortly tubular, unscented, light yellow to orange or with a yellow tube and reddish orange lobes flowers in a complete umbel. Natural hybrids are common, especially with *R. zoelleri*. A variety of colored cultivars are now propagated, from pure yellow to intense oranges, pink and a spectacular bicoloured form with a yellow tube and red lobes. It is a very tough species, and because of its low altitude distribution, is more heat tolerant than most vireyas and can give an exceptional display of flowers.



R. macgregorae. Photo: L. Muir.

***R. malayanum* ?** (Epithet: from Mayala, a general term for a wide area of the SE Asia archipelago in the 19th century)

This erect shrub to 5 m (16.5 ft) from southern Thailand, Malayasia (Peninsula and Borneo), and Indonesia (Sumatra, Java, etc.) was the first vireya to be described, and is the most widespread vireya species. There are three varieties and two forma, with the large-leaved forma *latifolium* coming



R. malayanum. Photo: M. Robinson.

down almost to sea level (200-1500 m; 660-4925 feet) in Borneo, usually on peaty accumulations over white sand. Its flowers are smallish, waxy and glossy, and range from bright red to pink, flowering from April to October. It was one of the parents of the early “Veitch’ hybrids in the 19th century.

R. nieuwenhuisii (Epithet: after the explorer A.W. Nieuwenhuis, Prof. of Ethnology at Leiden University)

This slender shrub to 60 cm (2 ft) is widespread in Borneo and is mostly epiphytic in dense, humid forests, from 100-800 m (330-2625 ft) elevation. It has twigs 1-3 mm (0.04-0.12 inches) in diameter, rugose leaves and broad ‘saucer-shaped,’ mostly solitary, horizontal or half-hanging, yellow flowers. It flowers several times a year but to thrive, needs much



R. nieuwenhuisii. Photo: C. Callard.

warmer and moister conditions than most other vireyas, reflecting its lowland habitat in the wild. It is a very delightful and distinctive species and according to Christy Hartsell (pers. comm.), George Argent said “this is the only true warm greenhouse vireya. I have to bring this plant into the greenhouse if temperatures drop below 4.5° C (40° F).”

R. zoelleri (see (3) above)

7) vireyas with unusual corollas (colour, shape, size) or leaves

R. ericoides (Epithet: resembling the South African heather *Erica*, referring to its leaves)

This wiry alpine shrub endemic to Mt. Kinabalu in Malaysian Borneo can grow to 1.5 m (five feet) in the wild but is much smaller in cultivation. Its leaves are heather-like, very dense and are spirally arranged, and its bright red flowers are solitary or paired and hanging. It is cultivated with some difficulty, as it does not tolerate high temperatures and grows slowly; plants



R. ericoides. Photo: C. Callard.

collected at the lower end of its altitudinal range are most successful. Its bizarre heather-like appearance makes it one of the most unusual and distinctive vireyas.

R. herzogii (see (2) above)

R. himantodes (Epithet: referring to its strap-like leaves)

This slow-growing shrub to two m (6.5 ft) from Borneo has slender twigs and leaves in pseudowhorls of 12-25 or regularly spirally arranged. Its 8-15 flowers per umbel are erect or semi-erect, and its unscented flowers are white with prominent brown scales. It is a very dainty species and is very distinct with its narrow strap-shaped leaves and short, white, brown scaly flowers with highly contrasting chocolate brown anthers. Its flowering time is irregular, but it flowers regularly, usually once a year, and because of its foliage and flowers, it is stunningly attractive.



R. himantodes. Photo: C. Callard.

R. praetervisum (Epithet: overlooked, referring to its being initially associated with *R. longiflorum*)

This endemic species to Mt. Kinabalu in Borneo, Malaysia (1100-1800 m elevation) grows in the wild to two m (6.5 ft). It has 4-6 larger (18-32 mm, one inch) leaves along with a few small ones in distinct pseudowhorls. There are 3-7 unscented, relatively long, hanging, pink or purplish violet flowers in an umbel. Introduced into cultivation in 1963, it was first labelled as *R. longiflorum* before *R. praetervisum* was described (the latter has a style with no hairs), although now it's hard to rationalise why it was not recognised earlier as the flowers of *R. longiflorum* are held semi-erect and are orangish-red in colour. It flowers most profusely around March, and is easy to grow.



R. praetervisum. Photo: C. Callard.

R. rugosum (Epithet: referring to its rugose (wrinkled) leaves)

This is another endemic species to the Malaysian mountains in Borneo (2000-

3500 m elevation), where in the wild it can grow to eight m (26 ft). Its most distinctive feature are its 60-120 mm (2.5-5 inch) elliptic, rugose leaves that have the extreme point deflexed downwards and margins often rolled inwards (revolute), and its 8-14 pink or purplish pink half-hanging flowers in an open umbel. Its new foliage is covered in bright orange-brown scales on both sides, which later rub off to leave a dark green leaf. It grows slowly and usually flowers only once a year in the spring, when it can be spectacular. It hybridizes naturally with *R. buxifolium* and possibly other species too, forming the hybrid swarm *R. x coriifolium* and the named hybrids *R. x keditii* and *R. x liewianum*.



R. rugosum. Photo: Chris Callard.

R. stenophyllum (Epithet: narrow-leaved)

This Malaysian endemic species from Mt Kinabalu, Borneo (like *R. ericodes*), can grow to three m (ten feet) in the wild and is distinctive because of both its 10-15 narrow, linear (40-70 mm long, 2.5-5 mm wide; 1.75-3 inch x 0.1-0.2 in wide) leaves in pseudowhorls and secondly, its 1-3 bell-shaped, bright waxy orange



R. stenophyllum. Photo: C. Callard.

to red unscented flowers together, held stiffly horizontal. Its leaves look a little like those of the Japanese umbrella pine, *Sciadopitys verticillata*). Although first described in the late 1800s, it was just introduced into cultivation in 1979, where it grows and flowers well and is now widely distributed. There are two subspecies, *stenophyllum* (from 2700-2800 m (8860-9200 feet) elevation) and *angustifolium* (from 1500-2400 m (4925-7875 feet) elevation), with the latter having longer, narrower leaves and flowering less frequently. Overall, it is a strange looking but handsome rhododendron that can be very floriferous, especially if grown at cooler temperatures.

R. taxifolium (Epithet: with leaves like *Taxus* (yew, Taxaceae))

This epiphytic Philippine shrub is endemic to Mt. Pulag and grows to about 1

m (3.25 feet) in the wild, has very tiny twigs (1-2 mm in diameter) and its 12-25 narrow, linear leaves are crowded into moderately dense pseudowhorls. Its white, unscented flowers are sometimes solitary, but mostly 3-5 together in an open umbel, that are half-hanging unless caught up in the foliage. Although only introduced into cultivation in 1992, it is now widely available, as it grows easily and flowers profusely. For a rhododendron, it has an attractive but bizarre appearance, like *R. ericodes*, but it is much easier to grow successfully, and it is well worth growing as a small pot plant.



R. taxifolium. Photo: C. Callard.

R. tuba (Epithet: referring to the trumpet-shaped corolla)

This terrestrial shrub to 5 m (16.5 ft) from Papa New Guinea has 4-5, 25-50 mm (1-2 inch) leaves together in tight pseudowhorls. What makes it so distinctive are its 4-7 scented flowers in an open one-sided umbel, with 65-80 mm (2.5-3 inch), weakly curved, trumpet-shaped corollas that have a pink tube and white lobes. It is a vigorous grower that can cover itself in beautiful flowers once a year in the spring.



R. tuba. Photo: R. Currie.

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5. The remaining Sections and Subsections of Subgenus *Rhododendron*, and the one species in Subgenus *Therorhodion*

(Photos are from numerous sources, including the Danish Chapter website and specific noted photographers)

Species of *Rhododendron* in subgenus *Rhododendron* are lepidotes, plants that are usually evergreen and have scales, most significantly on the leaves, with those on the underside usually most obvious. In the above articles, I discussed species in subgenus *Rhododendron* that were relatively tender [section *Schistanthe* (vireyas) (Jamieson 2020) and in section *Rhododendron*, the subsections *Maddenia*, *Edgeworthia*, and *Boothia* (Jamieson 2019b)] or had relatively large numbers of species in cultivation (*Lapponica* (Jamieson 2019a) and *Triflora* (Jamieson 2018)). Here, I discuss the more commonly cultivated, hardier species in subgenus *Rhododendron* in section *Pogonanthum*; in ten subsections of section *Rhododendron* that have a relatively small number of species in them: *Campylogyna*, *Caroliniana*, *Cinnabarina*, *Glauca*, *Heliolepidia*, *Moupinensia*, *Rhododendron*, *Rhodorastra*, *Saluenensia* and *Scabrifolia*; and the only species in subgenus *Therorhodion*, i.e., *Rhododendron camtschaticum*. Species between these taxonomic groups are often not closely related, and are distributed mostly in SE and NW Asia.

There have been no JARS articles written specifically about most of the species in each of the taxonomic groups discussed here, although some older articles (e.g., Dome (1977), Mossman and Mossman (1982), Blake (1984), Watts (1994), Dorsey (1996), Peterson (1997)) have singled out species in the different subsections for some of their desirable features, notably their utility in colder areas, their profusion of colour, and their small size. Other older articles showcase specific subsections (e.g., Blake (1985) for *Cinnabarina*, Philipson (1985) for *Saluenensia*, Blake (1987) for section *Pogonanthum* and section *Rhododendron* subsection *Campylogyna*,

and Blake (1986) and Watts (1992) for *Glauca*) and a few other articles look at the features of specific species, such as their value is hybridizing (e.g., Molinari and Smith (1991) for *R. racemosum*), but most species in the subsections listed here are only casually mentioned either in field explorations or as among other rhododendron species in garden culture.

Species descriptions in this article were derived from McQuire and Robinson (2009), Cox and Cox (1997) and the RSF website.

Genus *Rhododendron*

Clade A

Subgenus *Rhododendron*: Small leaf or lepidotes (have scales on the underside of their leaves). Three sections, about 506 species.

Subgenus *Choniastrum*: Eleven species.

Clade B

Subgenus *Hymenanthes*: Large leaf or elepidotes (without scales), including most deciduous azaleas. Two sections, with about 311 species.

Clade C

Subgenus *Azaleastrum*: Nearly everything else, most notably deciduous azaleas such as *R. schlippenbachii* and many evergreen azalea species from southeast Asia. Three sections, about 90 species

Subgenus *Rhododendron*

1) **Section *Pogonanthum*** (6 species)

2) **Section *Rhododendron*** (28 subsections, ~200 species)

3) **Section *Schistanthe*** (vireyas, 300+ species)

Section *Rhododendron* (numbers behind each subsection name are the number of species in that subsection; bold names are the subsections considered here)

Subsections:

1. *Afghanica* – 1
2. *Bailey* – 1
3. *Boothia* – 8
4. *Camelliiflora* - 1
5. ***Campylogyna*** – 1
6. ***Caroliniana*** – 1
7. ***Cinnabarina*** – 2
8. *Edgeworthia* – 3
9. *Fragariiflora* – 2
10. *Genestieriana* - 1
11. ***Glauc***a - 10
12. ***Heliolepid***a – 4
13. *Lapponica* – ~40
14. *Ledum* - 5
15. *Lepidota* - 3
16. *Madden*ia – ~40
17. *Micrantha* - 2
18. *Monantha* – 5
19. ***Moupinensia*** – 3
20. ***Rhododendron*** – 3
21. ***Rhodorastra*** – 5
22. ***Saluenensia*** – 6
23. ***Scabrifolia*** – 8
24. *Tephropepla* – 5
25. *Trichoclada* – 8
26. *Triflora* – 25

27. *Uniflora* – 5

28. *Virgata* - 2

A. Subgenus *Rhododendron* Species Considered by Section and Subsection

(Names in **red** font for red are the more available species.)

1. Section *Pogonanthum*

R. cephalanthum

R. primuliflorum

R. sargentianum

R. trichostomum

2. Section *Rhododendron*

Subsection *Campylogyna*

R. campylogynum

Subsection *Caroliniana*

R. minus

Subsection *Cinnabarina*

R. cinnabarinum

R. keysii

Subsection *Glauca*

R. brachyanthum

R. charitopes

R. glaucophyllum

Subsection *Heliolepida*

R. rubiginosum

Subsection *Moupinensia*

R. dendrocharis

R. moupinense

Subsection *Rhododendron*

R. ferrugineum

R. hirsutum

R. myrtifolium

Subsection *Rhodorastra*

R. dauricum

R. mucronulatum

R. sichotense

Subsection *Saluenensia*

R. calostrotum
R. saluenense
Subsection *Scabrifolia*
R. racemosum
R. spinuliferum

B. Subgenus *Therorhodium*
R. camtschaticum

Species Details in Subgenus *Rhododendron*

A. Subgenus *Rhododendron*

1. Section *Pogonanthum* (four of 14 species described)

Species are small shrubs with leaves scaly underneath, the corolla narrowly tubular with spreading lobes (resembling *Daphne*), and stamens short and often concealed in the corolla tube.

R. cephalanthum (Epithet: with flowers in a head)

This small 0.05-1.5 m (0.16-5 ft) high species from Myanmar, Yunnan, Sichuan and Tibet has conspicuous, persistent leaf bud scales and leaves that are densely covered beneath with fawn reddish or brown overlapping scales. Trusses have 5-10, white, rose, deep rose, pink or rose-crimson tubular flowers with spreading lobes and



R. cephalanthum. Photo: Garth Wedemire.

5-8 stamens, with flowering in April to May. There are two subspecies, *cephalanthum* and *platyphyllum*, with the latter consistently larger and with wider leaves and white flowers. The former subspecies has within it the Crebreflorum Group, which is very prostrate, spreading or very compact, and may be stoloniferous. Cox and Cox (1997) note that compact, pink-flowered forms make the best garden plants.

R. primuliflorum (Epithet: primrose flowers)

A tiny shrub .05-1.8 m (0.16-6 ft) high from E Siberia, Tibet, Gansu, Yunnan and Sichuan that is very similar to *R. cephalanthum* except for always only five stamens and deciduous bud scales, this species has brown or rust-coloured scales on the leaf underside and 5-10, white, pink, creamy-yellow or yellow flowers in its truss. It flowers in April-May, a month earlier than *R. trichostomum*. It is a very variable species, ranging from tall and rangy to dwarf and compact, with the Cephalanthoides Group 'Doker La' clone particularly good.



R. prinuliflorum 'Dokar La'. Photo: Garth Wedemire.

R. sargentianum (Epithet: after G.S. Sargent, Director of the Arnold Arboretum, MA, USA)

A compact shrub 30-60 cm (1-2 ft) high from Sichuan, this species has persistent leaf bud scales and leaves that are densely scaly with rust or brown-coloured scales underneath. Trusses have 5-7 (rarely to 12) lemon yellow, pale yellow to white flowers that are densely scaly outside and five stamens, with flowering in April-May. It is not always easy to grow, but at its best, is free-flowering from a young age and very showy.



R. sargentianum 'Liz Ann'. Photo: Garth Wedemire.

R. trichostomum (Epithet: hairy-mouthed)

Another tiny shrub, this 0.2-1.2 m (0.6-4 ft) high species from Yunnan and Sichuan has deciduous leaf bud scales, a narrow leaf with recurved margins, with leaves that are densely scaly underneath with rust or brown-coloured scales.



R. trichostomum. Photo: Garth Wedemire.

Trusses have 8-20 white, pink, rose or deep rose flowers that are densely hairy within the corolla tube, with flowering in May-June. There are two varieties, *hedyosmum* and *radinum*, with the former differing from the basic species by being sweet-scented and with a longer tube, and the latter having the leaf upper side often densely scaly. This species is variable in hardiness and flower quality, with clear pink or pure white forms most desirable.

2. Section *Rhododendron*

Subsection *Campylogyna* (one species)

Plants here are dwarf, often prostrate shrubs, with small foliage, and pendulous flowers held above the foliage on long pedicels.

R. campylogynum (Epithet: with bent ovary)

A 0.6-1.8 m (2-6 ft) high shrub from Yunnan and Tibet, this species has leaves with scales on their underside that are 1-6 times their diameter apart. The trusses of 1-3, nodding, pale rose-purple, salmon-pink, carmine to deep plum-purple or almost black-purple flowers with a long pedicel



R. campylogynum. Photo: Garth Wedemire.

and ten stamens occur from May to June. There are a number of recognized groups, differentiated by both flower colour and growth habit: Celsum Group (habitat erect, plum-purple flowers), Charopoeum Group (habit compact, spreading, plum purple or pale rose flowers), Myrtilloides Group (habit dwarf, compact, rose-purple flowers) and Cremastum Group (habit more upright, light plum-rose, bright red, or deep wine-red flowers). This species is easily recognised in flower by its thimble-shaped flowers on long stalks, and is a very popular species, being one of the finest dwarfs. It is however variable in hardiness and dislikes high temperatures and dry soils.

Subsection *Caroliniana* (one species)

R. minus (Epithet: smaller)

This 1.2-6 m (4-20 ft) high species from the eastern USA is densely scaly on the leaf underside and has trusses of 6-12 white to pale pink or pale rose flowers in May to June. There are two varieties, *minus* and *chapmanii*, with the former usually having larger, smoother leaves than *chapmanii*. Var. *chapmanii* is from W Florida, and while cold hardy, needs high summer heat to ripen the wood. It is closely related to species in subsection *Heliolepidia*, differing mainly in the calyx. It's a parent of many hardy hybrids (e.g., 'P.J.M.'), but the species itself often has poor chlorotic foliage and a weak root system.



R. minus var. *minus*. Photo: Don Hyatt.

Subsection *Cinnabarina* (two species)

Leaves often glaucous (covered with a waxy bloom), and flowers tubular to campanulate (bell-shaped), usually pendulous.

R. cinnabarinum (Epithet: cinnabar-red)

This is an upright species that has three subspecies: *cinnabarinum*, *tamaense* and *xanthocodon*. Subsp. *cinnabarinum* is 1.2-5.5 m (4-18 ft) high from Nepal, Sikkim, Bhutan and Tibet with the upper surface of the evergreen leaves bluish- or olive-green and the underside densely scaly, with a pendulous truss of 2-5,



R. cinnabarinum Breviforme Group.
Photo: Garth Wedemire.

cinnabar-red, salmon-pink, yellow or orange flowers in April-July. Within the subspecies, there are three noteworthy variations: the Blandfordiiflorum Group which has flowers red on the outside and yellow or greenish-yellow on the inside, the Roylei Group which has flowers red on both the outside and inside, and the Breviforme Group (sometimes referred to as var. *Nepal*)

that has a shorter corolla that is red on the outside and yellowish on the margins and inside. Subsp. *tamaense* is deciduous or semi deciduous (no persistent leaves from previous years) and is a 1-1.8 m (3-6 ft) high species from Myanmar, with deep-purple, purple or pale lavender flowers in a truss of 2-5 flowers. Subsp. *xanthocodon* from Bhutan and Tibet has wider leaves than subsp. *cinnabarinum* and a truss of 2-6 (rarely 8) creamy-yellow flowers without spots. It has two noteworthy variations: the relatively compact Concatenans Group with quite large, broad leaves that are tinged purple or purplish-brown on their underside, with a truss of 3-8, apricot-yellow coloured flowers; and the Purpurellum Group, with smaller leaves and flowers usually rich plum-purple or bright purplish-mauve. The latter seems to be intermediate between Subsection *Cinnabarina* and *R. oreotrephe*s in Subsection *Triflora*.

The species is greatly liked because of its pendant, tubular, fleshy flowers of many colours and its often fine, glaucous foliage.

R. keysii (Epithet: after a Mr. Keys)

This lax flowering and upright 0.6-6 m (2-20 ft) species from Bhutan, Assam and Tibet has leaves often larger, narrower and thinner in texture (more willowy habit) than those of *R. cinnabarinum* that are densely scaly beneath, and small, thin, orange, coral, salmon-

pink or deep scarlet tubular flowers with yellowish lobes from both terminal and axillary buds. The massed tubular flowers are curiously attractive and are quite unlike those of any other species.



R. cinnabarinum subsp. *xanthocodon* 'Copper'. Photo: Garth Wedemire.



R. cinnabarinum var. *roylei*. Photo: Garth Wedemire.



R. keysii. Photo: Hans Elberg.

Subsection *Glauca* (three of ten species described)

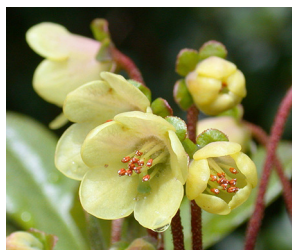
Leaves aromatic, with their underside white or greyish, glaucous with two kinds of scales, and the flower style short and sharply declined.

R. brachyanthum (Epithet: with short flowers)

A 0.3-1.8 m (1-6 ft) high species from Yunnan and Tibet, with two subspecies: *brachyanthum* and *hypolepidotum*. With subsp. *brachyanthum*, the underside of the very aromatic leaves is glaucous with scales that are partly or completely deciduous. Trusses have 3-10, pale or deep yellow or greenish-yellow flowers, with flowering from May to July. The style is short, stout and sharply bent. Subsp. *hypolepidotum* is more commonly grown and has leaves whose underside is densely scaly with pale yellow and brown scales. The late, yellow “thimbles” on long stalks are unlike the flowers of any other species, and out of flower, the glaucous leaf underside and peeling bark are distinctive.



R. brachyanthum subsp. *brachyanthum*. Photo: Ingolf Bogø .



R. brachyanthum subsp. *hyperlepidotum*. Photo: Hans Eiberg.

R. charitopes (Epithet: graceful of aspect)

A relatively compact, rounded, 0.2-1.5 m (0.75-5 ft) high species that has two subspecies, both with aromatic leaves: *charitopes* and *tsangpoense*. Subsp. *charitopes* from Burma and Yunnan has obovate or oblong-obovate leaves, with the leaf undersides markedly glaucous (with a bloom) and densely scaly with both yellow and larger, widely separated brown scales. Trusses of 2-6, apple blossom-pink, saucer-shaped flowers speckled with crimson occur in April-May. Subsp. *tsangpoense* from Tibet has a larger calyx than subsp. *charitopes* and has reddish-purple, pinkish-purple pink or rarely cerise



R. charitopes subsp. *tsangpoense*. Photo: Garth Wedemire.

flowers. In both subspecies, scales of each type are separated from each other, which is different from *R. pruniflorum*, also in this subsection, which has a similar leaf shape.

R. glaucophyllum (Epithet: with bluish-grey leaf)

This 0.3-1.5 m (1-5 ft) high species also has two subspecies both with aromatic leaves: subsp. *glaucophyllum* from Nepal, Sikkim and Bhutan and *tubiforme* from Bhutan, Assam and Tibet. The former usually has pointed leaves, glaucous, densely scaly, leaves that are narrower than those of *R. charitopes*, with smaller pale-yellow



R. glaucophyllum. Photo: Garth Wedemire.

scales and larger, widely separated brown scales. The calyx is leafy, and trusses have 4-10, pink, rose, pinkish-purple or reddish-purple campanulate flowers in April to May. Subsp. *tubiforme* uniquely in this subsection has a long, slender, straight style, and more tubular, pink or deep rose flowers. There is a var. *album* from Nepal that has large, uniformly white flowers.

Subsection *Heliolepidia* (one of four species described)

Leaves very aromatic, and their underside with large scales. The corolla is conspicuously scaly outside, with a straight, slender style.

R. rubiginosum (Epithet: bereft of scales)

This 1.5-8 m (5-26 ft) high species from Myanmar, Yunnan, Sichuan and Tibet, with leaves that are less aromatic than the other species in this subsection, that are densely scaly beneath with rust-coloured or brown scales, with or without larger darker scales. Trusses are 4-8, pink, pale rose, pinkish-purple, lavender-



R. rubiginosum. Photo: Garth Wedemire.

purple or rarely white, tubular or funnel-shaped flowers, with crimson spots and a scaly outside, in April to May. This is a widely grown, vigorous species that can grow large and is variable in hardiness and flower size. The Desquamatum Group have larger widely-funnel-shaped flowers and relatively large leaves and includes some of the less hardy forms.

Subsection *Moupinensia* (two of three species described)

Small to medium size shrubs, often straggly with bristly branchlets. Leaves are thick and rigid, and trusses are 1-2 flowered, with a widely campanulate corolla.

R. dendrocharis (Epithet: tree-adoring)

This dwarf, 35-70 cm (1.1-2.3 ft) high, often epiphytic species from Sichuan has small, elliptic or oval, thick, rigid, mucronulate (terminates in a sharp point) leaves that on the underside are densely scaly with brown scales. Inflorescences have 1-2, pale to deep pink, widely funnel-shaped flowers that on the outside are not scaly, while the inside of the tube is densely minutely pubescent, with flowering in March and April.



R. dendrocharis. Photo: Garth Wedemire.

R. moupinense (Epithet: from Moupin, W China)

This 0.6-1.5 m (2-5 ft) high species from Sichuan is often epiphytic in the wild and can be distinguished from *R. dendrocharis* by being bigger in all aspects, is earlier flowering, is less compact, and the straight rather than deflexed style is longer than the stamens. It has persistent bud scales and white



R. moupinense. Photo: Garth Wedemire.

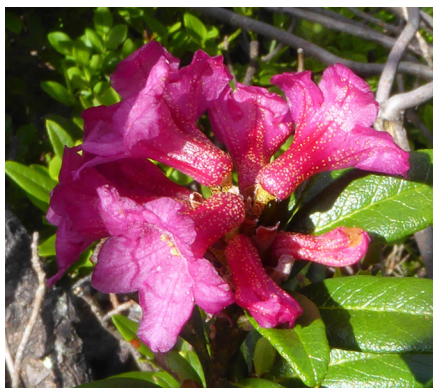
or white tinged with pink flowers. It is a desirable early flowering species that is free-flowering and relatively frost-hardy in bud and in flower, with attractive young growth. However, it dislikes excessive summer heat, has rather brittle shoots and has a relatively small root system. It needs good drainage but is quite drought resistant.

Subsection *Rhododendron* (two of three species described)

Compact European shrubs, branchlets and leaf underside densely scaly, leaf margin often crenulate, rachis elongated and the corolla tubular with spreading lobes.

R. ferrugineum (Epithet: rusty-coloured)

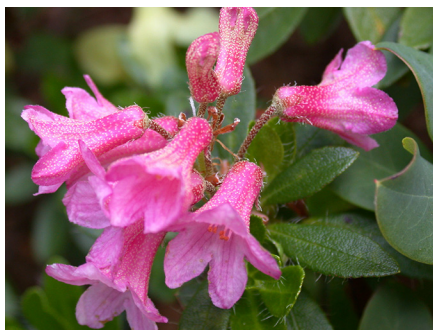
This 0.3-1.2 m (1-4 ft) high shrub from the European Alps, the Pyrenees, and the mountains of Bulgaria has branchlets not bristly, with leaves darker than *R. hirsutum* and their underside densely scaly with dark brown or reddish-brown overlapping scales. The calyx in minute, and trusses have 5-16, crimson-purple, rose-scarlet or deep rose, rarely white, flowers that are moderately to densely scaly outside, with flowering from June to July. It differs from *R. hirsutum* in its glabrous, darker leaves with overlapping or touching scales, and its usually larger flowers with a glabrous style. It does not tolerate high temperatures or drought but is cold-hardy.



R. ferrugineum. Photo: Hans Elberg.

R. hirsutum (Epithet: hairy)

A small 0.3-1 m (1-3 ft) high shrub from the Central European Alps with scaly, often bristly branchlets, this species has crenulate, bristly leaf margins and the leaf underside with scales 2-4 times their own diameter apart. The calyx has a margin with long hairs,



R. hirsutum. Photo: Hans Elberg.

and trusses have 4-12 rose-pink, scarlet or crimson flowers whose outside is scaly and inside pubescent, with the margin of the lobes hairy. Flowering is from June to July. This species is often referred to as the “Alpine Rose” and is useful for its ability to grow in alkaline soils. It is more difficult to grow than *R. ferrugineum* and may hide its flowers in its young foliage.

R. myrtifolium (Epithet: with myrtle-like foliage.)

Another small 30-45 cm (1-1.5 ft) high shrub, this species is from the Transylvanian and Carpathian Mountains and the mountains of Bulgaria and North Macedonia and has smaller leaves and is more compact than *R. ferrugineum*. Leaves are crenulate and are densely scaly. Its tubular, slender flowers are



R. myrtifolium. Source: Wikimedia Commons.

crimson-purple, scarlet-purple or rarely white and are densely pubescent of the tube and moderately so on the lobes. Trusses have 3-7 flowers and occur from May to July. It is smaller and earlier flowering than *R. ferrugineum* and is not as easy to grow.

Subsection *Rhodorastra* (three of five species described)

Shrubs with leaves usually wholly or partly deciduous, early flowering and with early young growth and thin leaves. The corolla is widely-funnel shaped with a straight, slender style, and 1-2 flowers in an inflorescence.

R. dauricum (Epithet: from Daura, part of SE Siberia, east of Lake Baikal)

A 1.5-2.4 m (5-8 ft) high species from Russia, Manchuria, NE China, Korea and Japan, this species is distinguished by its densely scaly leaf underside, the rounded leaf apex, and the smaller flower when compared to *R. mucronulatum*. Its leaves are



R. dauricum. Photo: Garth Wedemire.

deciduous, and its pink, rose-purple, reddish-purple or dark purple, widely funnel-shaped flowers, outside pubescent, appear before the leaves from January to March. 'Hokkaido' is a prolific, white-flowered form. This is a very useful species for its hardiness and early flowering, with many selected clones now available. It needs good drainage to grow well. It differs from *R. mucronulatum* with leaves rounded at both ends that are partially retained through the winter, and which are smaller and of thicker substance with a dense covering of scales on their lower surface.

R. mucronulatum (Epithet: with a small point)

This 1-4 m (3-13 ft) high species from SE Siberia, Manchuria, N China, Korea and Japan has deciduous leaves with a pointed (acuminate) leaf apex and rose, rose-purple, or reddish-purple flowers that are pubescent on the outside. There are two varieties, *mucronulatum* and *taqueti*, with the latter being from Jeju Island, Korea, and a dwarf version, being only 10-30 cm (0.33-1 ft) high. Flowering is from January to March. Most cultivated forms have pink flowers, which are rare in *R. dauricum*, although intergrading forms between the two species exist.



R. mucronulatum. Photo: Glen Jamieson.

R. sichotense (Epithet: ?)

This evergreen or semi-evergreen species from the Commonwealth of Independent States, a regional organization consisting of Russia, Belarus, Ukraine, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Turkmenistan, Tajikistan, and Uzbekistan, has larger leaves than *R. ledebourii*, which is from the Altai Mountains in Russia, densely scaly pedicels, and pale purplish-pink or rose flowers. Cox and Cox (1997) suggest that this species and *R. ledebourii* may be regional variations of *R.*



R. sichotense. Photo: Hans Elberg.

dauricum. Both have more fully evergreen leaves than *R. dauricum* and the former has particularly large flowers.

Subsection *Saluenensia* (two of six species described)

Small shrubs with leaves densely scaly beneath, a usually coloured calyx and a corolla that is widely funnel-shaped or rotate (very short with spreading, almost flat petals).

R. calostrotum (Epithet: with a beautiful covering)

This 8-90 cm (0.25-3 ft) high species has four subspecies: *calostrotum* from Myanmar, Yunnan, Tibet and Assam; *riparium* from Myanmar and Yunnan; *riparioides* from Yunnan; and *keleticum* from Tibet and Yunnan. All three subspecies have



R. calostrotum. Photo: Garth Wedemire.

branchlets, petioles and pedicels not bristly; the undersides of leaves with scales in 3 or 4 distinct tiers; and with flowering in May. Subsp. *calostrotum* has young leaves that are more or less glaucous or greyish, and densely scaly. Trusses have 1-3, saucer-shaped or rotate, purple, rosy-purple, crimson-purple or scarlet flowers, with the outside pubescent and scaly. Subsp. *riparium* is a low, spreading or broadly upright shrub to 60 cm (2 ft) high, with smaller, pale, greyish leaves and flowers pale pinkish or rosy-purple. Subsp. *riparioides* has leaves usually glaucous on their upper surface and scales that are not tiered, with the form *R. calostrotum* Rock most often cultivated. Subsp. *keleticum* is a very compact, rounded, spreading shrub 15-45 cm (0.5-1.5 ft) high with somewhat pointed leaves that are not scaly on the upper surface. Flowers are deep purplish-crimson or purplish-rose, with crimson spots, with the outside densely pubescent and scaly along the middle of the lobes. Most forms are free-flowering and form neat, compact plants, although some are particularly susceptible to powdery mildew.

R. saluenense (Epithet: from the Salween River)

This species has two subspecies: *saluenense* and *chameunum*. The former is a shrub 0.6-1.5 m (2-5 ft) from Tibet, Yunnan and Sichuan that has scaly branchlets and young growth, in contrast to *R. calostrotum*. Both sides of leaves are scaly, with scales on the underside dense, overlapping in different tiers but somewhat flattened. The calyx and ovary are not bristly. Trusses have 1-4, sometimes 5-7 deep purple-crimson, deep purple or deep rose-crimson flowers, with crimson spots and their outside scaly and pubescent, with flowering in April-June. Subsp. *chameunum* differs from subsp. *saluenense* by having young growth with crimson purple margins and usually the leaf upper surface not scaly. It is also smaller, being 5-60 cm (0.16-2 ft) high, and is from Tibet, Yunnan, Sichuan and Myanmar. Subsp. *chameunum* Charidotes Group has a bristly calyx and ovary, and seems to be intermediate between the two subspecies, being 8-30 cm (0.25-1 ft) high. Subsp. *chameunum* Prostratum Group is a high-altitude form, and even more prostrate. The species differs from *R. calostrotum* in its hairy new growth, branchlets, petiole and pedicel, and a normally paler lower leaf surface.



R. saluenense subsp. *chameunum*.
Photo: Garth Wedemire.

Subsection *Scabrifolia* (two of eight species described)

Shrubs, often straggly, with branchlets often pubescent or bristly, upper leaf surfaces often pubescent and flowers usually axillary.

R. racemosum (Epithet: flowers in racemes)

A 0.15-4.6 m (0.5-15 ft) high shrub from Yunnan and Sichuan with small, smooth, rounded, glabrous leaves, glaucous beneath or minutely pubescent. Trusses are axillary in the uppermost few leaves in several clusters forming a raceme (flowers on an unbranched main stalk) along the branchlet. Flowers



R. racemosum. Photo: Garth Wedemire.

are widely funnel-shaped, white, pink, deep rose or reddish-pink, with the outside scaly, and occur in March-May. This is a widely grown and very variable species that has been much used in hybridizing. Taller forms will benefit from pruning when young.

R. spinuliferum (Epithet: bearing spines)

A shrub 0.6-4.6 m (2-15 ft) high from S Sichuan and Yunnan that has bullate, scaly upper leaf surfaces with the margins often bristly, and a densely pubescent, scaly lower leaf surface. Trusses are upright and either axillary in the upper most few leaves or terminal, with 1-5 flowers. This species is unmistakable in flower, with the corolla tubular but contracted at the upper end and crimson-red, red, pink or yellowish with flowering in April-May. Flowers are long-lasting and always attract attention.



R. spinuliferum. Photo: Garth Wedemire.

B. Subgenus *Therorhodion*

R. camtschaticum (Epithet: from Kamtschatka)

This unique, distinctive elepidote species from Kamtschatka, the Aleutian Islands, Alaska and south to the Kurile Islands and northern Japan is a low-growing or prostrate, 10-30 cm (0.3-1 ft) high shrub with deciduous leaves that are short-petioled or sessile and bristly beneath. One to Two carmine-purple, reddish-purple or pink flowers, spotted and pubescent on the outside, are borne at the ends of the young, leaf-like bracts (these are actually the pedicel). It flowers from May-June, and there is a white



R. camtschaticum. Photo: Pavel Gorbunov.

form called var. *albiflorum*. There are two subspecies, *camtschaticum* and *glandulosum*, with the latter lower-growing and very rare in cultivation. It is an excellent hardy plant for cool climates but is prone to spring frost damage.

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