

The Natural Environment for Vireya Rhododendrons

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In this article I write about the environment in which Vireya rhododendrons grow in nature and suggest how similar growing conditions may be achieved to make them feel at home in cultivation. My remarks will be restricted to those species which grow in Papua New Guinea, the only area of which I have any first hand knowledge.

The genus *Rhododendron* contains about 900 species growing in the wild. Of these about 300 species belong to the subgenus Rhododendron, section Vireya, and the majority of these are found growing in the tropical and subtropical regions of the Malay Peninsula, Sumatra, Java, the Philippines, the Solomon Islands, and Papua New Guinea. Of the 300 Vireya species, almost half are found in Papua New Guinea which lies just south of the Equator between the latitudes of 2 degrees and 12 degrees south.

In the wild, Vireyas are found growing as terrestrial shrubs or as epiphytes. Many species will grow in either situation, but it is true that although all species found growing as epiphytes have been found growing as terrestrial plants, the reverse is not the case. A number of species found growing as terrestrial plants have never been found growing as epiphytes. It would appear that Vireya rhododendrons prefer to grow as terrestrial plants, but when growing in dense forests in competition with other trees, they grow as epiphytes in an attempt to obtain more light and better drainage.

Being tropical and subtropical plants where day length and night length are almost equal both summer and winter, they do not recognise different seasons, except perhaps wet and dry seasons, and as a result they may flower at any time of the year. In the Daga country of eastern Papua New Guinea where the Rev. Canon Norman Cruttwell was stationed for many years, he found that there was a peak flowering period in May and June and again in September and October, correlated with the rainy season, the north west monsoon, the flowering chiefly occurring in the drier seasons.

The rainfall is unusually high where *Vireya* rhododendron species grow in Papua New Guinea. At Agaun where Canon Cruttwell was formerly based, the annual average rainfall was 100 inches, and it was even higher further up the mountains. Rainfall is distributed unevenly in Papua New Guinea, depending on the wind direction. From May to October, there is a lot of rain on the northern slopes of the central mountain ranges. The monsoon season is from December until March and this also brings heavy rain in the northern area.

In considering the environment in which *Vireyas* grow in Papua New Guinea, it is important to remember the altitudinal zonation of vegetation as described in Merrill's classification in *Plant Life of the Pacific World*.

1) From sea level to 3000 feet may be found Tropical Rain Forest. This zone also includes grassland and savannah developed from it by clearing and burning. In eastern Papua New Guinea, Canon Cruttwell has found *R.christianae* growing as low as 1500 feet. The type locality of *R.aurigeranum* near Zenag Pass is at an altitude of about 3000 feet. *Rhododendron zoelleri* may also be found within this altitude range, even down to 300 feet at Green River in the Sepik River basin.

2) From 3000 to 5000 feet altitude, there is Montane or Mountain Forest. There are grass clearings to 4000 feet, but above that altitude the forest is fairly continuous. Many *Vireya* species grow in this zone, as epiphytes in the

forest areas and as terrestrial plants in the grasslands. Where the forest area has been burned by the local people to make cultivated land, short grassland appears dominated by *Themeda australis*. This is gradually replaced by tall grassland where *Miscanthus floridulus* dominates. *Rhododendron* species are capable of invading the short grassland and slowly disappear as terrestrial plants as the vegetation changes to tall grassland and forest.

3) From 5000 to about 7500 feet is found the Mossy or Cloud Forest characterised by an abundant growth of epiphytes. In this zone many rhododendron species grow as epiphytes, although a few may be found growing as terrestrial plants.

4) From 7500 feet to 9000 feet, and at even higher altitudes in the gullies, is found the Elfin Wood, characterised by dwarfed twisted trees and ericaceous shrubs with roots out of the ground in some places, covered with dense moss. Many rhododendrons grow in this zone, and in some places thick rhododendron shrubberies may be found.

5) From 7500 feet to the summits on exposed slopes, plateaux and ridge tops at about 12000 feet, often alternating with Elfin Wood, occurs the Sub-Alpine Grassland. In this zone a number of dwarf rhododendron species grow.

The above zonation occurs throughout Papua New Guinea; the altitude at which each zone starts varies in different localities, but the zones always occur in the same order.

The *Vireya* rhododendron species in Papua New Guinea are adapted to an almost constant climate of daily variations in temperature. The temperature at night can be cold, sometimes even below zero, but the low temperature each day is of short duration. Temperature decreases with increasing altitude, and there can be frost above 8000 feet and non-persistent snow above 12000 feet in the alpine area. Above 15500 feet in West New Guinea (West Irian) there is persistent snow and glaciers. Consequently those species found growing in the wild at lower altitudes are more frost tender than those found growing at

higher altitudes. There is in Papua New Guinea a progressive lowering of temperature at the same altitude as one moves from west to east, so that the climate at Agaun at 3200 feet in the east is comparable with the climate at Goroka, in the Eastern Highlands District much further west than Agaun, at an altitude of 5500 feet. The reason for this is that there is an increase in latitude moving from west to east, Goroka being nearer to the Equator than Agaun. At Agaun the minimum night temperature is 49°F and there are frequent night temperatures in the low 50°s. At 9000 to 10000 feet, where some of the tubular flowered *Solenovireya rhododendron* species grow, there is often several degrees of frost at night, but never any snow or ice in day time. Therefore one would expect these species to grow in the open, not only in favourable parts of Australia and America but even in some parts of England.

The type of soil where rhododendrons are found growing in Papua New Guinea varies considerably from area to area, but in all area the soil is enriched with an abundance of leaf mould, and mosses grow over the soil surface. Those rhododendrons growing as epiphytes either have their roots spread out in the moss on the sides of the trees, or grow in pockets of leaf mould in the forks of branches. In all areas there is sharp drainage combined with abundant water and high root humidity. Often the roots are found to be very extensive, but they do not usually penetrate very deeply into the soil. Many specimens are often very thick and woody and very old.

During my visit to Papua New Guinea with a party from the Australian Rhododendron Society in September 1981, I was soon to learn what a wonderful pioneer coloniser the *Vireya rhododendron* was, landslides and roadside cuttings alike being quickly colonised by rhododendron seedlings, once there was a covering of moss over the area, and provided the altitude was right for rhododendrons to grow. On roadside cuttings we saw seedlings of *R. macgregoriae* growing out of the steep banks and in flower.

A number of *Vireya* species were observed growing happily in their natural habitat. Near the summit of Mount Kaindi, a high mountain near Wau, and

covered with dense mossy forest, tall specimens of *R.solitarium* were growing as terrestrial plants, and nearby several species were growing as epiphytes among the mosses and on the sides of treeferns. At a lower altitude, between Mount Kaindi and Wau, are the old Edie Creek goldfields, and here in *Miscanthus floridulus* grasslands on the site of these old alluvial goldfields were a number of species growing happily.

At Goroka, we met Canon Cruttwell and climbed Mount Gahavisuka. Passing through mossy forest we observed a number of Vireya species growing as epiphytes and a few as terrestrial plants, but it was on reaching a spur at 7500 feet altitude that we emerged from the mossy forest into Elfin Wood, consisting of shrubby trees and *Miscanthus* grass, that we found the greatest number of rhododendrons all growing as terrestrial plants.

During the drive from Goroka to Wabag, numerous plants of *R.macgregoriae* were seen on roadside cuttings, and on the Mount Hagen - Tambul Road at Mur Mur Pass at an altitude of 8600 feet, and at Tambi Tanis in the Sirunke area at the same altitude, many rhododendron species and natural hybrids were observed growing as terrestrial plants.

Being tropical or subtropical plants, Vireya rhododendrons compensate for their deficiency in hardiness in cool temperate climates, by having big scented and / or brilliantly coloured flowers, varying in colour from snow-white to dark crimson, or they may have deeply coloured pure yellow flowers, and there are pink, rose-red, and orange colours between. Bluish shades are absent in all species.

In Australia we have found that they can be grown with relative ease and we appreciate their versatility. They can be grown as garden, patio, bush-house plants or for home decoration and are successful in Melbourne, Sydney and Brisbane.

Vireya rhododendrons are not difficult to grow as long as four basic requirements are understood. There must be a good supply of moisture, good light, protection from extremes of temperature, and most important of all, good drainage. They will not tolerate frost, and grow best with a temperature ranging between 40° and 80°F. All species will survive temperatures of 32°F for short periods, but those species growing in nature at the lower altitudes in Papua New Guinea will be killed by temperatures falling below 30°F for any length of time.

They grow well in plastic pots or tubs, but good drainage and a very open potting mix are essential. Materials such as tree fern fibre, pine bark, coarse river sand, and scoria all help to keep the mix open, while use of peat-moss and leaf-mould will both open the soil up, and help retain moisture. Good rich virgin soil can also be added. A Vireya can also be grown in tree-fern logs, if, when small, it is planted in a gouged out recess in the log. They can be grown successfully in the open ground, but good drainage is essential and the addition of peat-moss or leaf-mould dug into the soil would be of benefit.

These plants require good light to flower well, but as stated earlier, some protection from extremes of both heat and cold. Shielding from hot or very cold, drying winds, very hot sun, and from frost is advisable.

Vireyas require small quantities of fertilizer only, otherwise they become too soft, tender and spindly. Light dressings of a slow-release fertilizer, or periodic half strength applications of a liquid fertilizer are adequate.

They suffer very little from insects or disease. If any damage does occur, normal protective procedures can be followed. Probably the main disease to affect these plants is powdery mildew which can be controlled with frequent applications of a suitable fungicide.

The Section Vireya in the genus *Rhododendron* containing as it does, one third of the species of the genus, has some species with very spectacular

flowers, some of which have scent, size and colour not otherwise seen in the genus. These, together with many beautiful hybrids which have been bred from them, certainly justify every effort being made, and that little extra care and attention to succeed with them in cultivation and to enjoy their beauty.

My thanks are due to the Rev. Canon Norman Cruttwell for the assistance and encouragement he has given to me during the twenty-two years I have been growing Vireya rhododendrons, and also to Mr. John Womersley for his help during the same period, and especially for his advice in the preparation of this article.

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