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Alan Ayton lives in Tangambalanga, Victoria, Australia with his family. All keen hikers, they generously share their enthusiasms with us, via Alan's articles and the enticing plant-heavy videos posted on YouTube. Here he describes a hike they took to see "some of the plant species that can be seen in the Tongariro National Park which is located in the North Island of New Zealand. The Park hosts some 500+ species of plants amongst a diverse range of habitats. The volcanic backdrop provided by the 3 active Volcanoes in this park also provides some unique scenery and habitats."

Left: Alan Ayton

Below: Jaime Espejo

Jaime Espejo, one of the authors of our second article, is involved in editing a field guide to Chilean violas: "Guía de Campos de las Violas Chilenas." Anita Flores and the late John Watson were great supporters of Scottish Rock Garden Club and the International Rock Gardener e-magazine, and published many of their articles on Rosulate Violas, including the ground-breaking monograph, " VIOLA SUBGENUS NEOANDINIUM, PRELIMINARY MONOGRAPH" with us. Jaime Espejo has been involved with various previous guides to plants of his native country, (he lives in Los Ángeles, Chile) for example, Ferns, Orchids and Alstromeria. You can learn more about the future Viola guide at CORMA, which features Anita Flores, J. Watson, Gloria Rojas, S. Teillier. Jaime Espejo and Raul Briones.

Cover image: *Dracophyllum filifolium* - photo Alan Ayton.

Hiking in New Zealand: Tongariro National Park – North Island

Text and photos; Alan Ayton

Being a family orientated three-week trip, there was not much time to botanise on this trip apart from a few locations. Luckily for me Janet and Tully (my wife and son) are keen walkers/hikers. So, a few locations managed to get on the tourist list! They included Tama lakes walk in Tongariro National Park, Lake Alta in the Remarkables (Queenstown), the Kepler track in Fiordland and The Hooker Valley Track at the base of Mt. Cook. In this article I will concentrate on Tongariro National Park.

Tongariro National Park covers an area of 786 km2 which surrounds the massif of the three active volcanoes Mount Ruapehu, Mount Ngauruhoe, and Mount Tongariro in the centre of the North Island. The incredible Volcanic processes in this park have been building it for over two million years. Three volcanoes (Tongariro, Ngauruhoe and Ruapehu) remain active, while the park's two northernmost volcanoes (Pihanga and the Kakaramea-Tihia Massif) last erupted over 20,000 years ago. These however have produced significant historic mudflows and deposits. As one can imagine the park has numerous vegetation zones which mostly have distinct boundaries which are forest, shrub, scrubland, tussock, fernland, sedgeland, rushland, moss field, gravel and stone fields and ice field. Some 574 species of plants have been documented in this park.

View of Tongariro National Park

Tama Lakes Walk.

Just south of Lake Taupo lies Tongariro National Park, it contains active and extinct volcanoes and many other features that are either linked to the active volcanoes or relicts of the extinct volcanoes.

These included the Tama lakes - Upper and Lower. This trip was an in and out hike of about 18 km, which took about 6 ½ hours with about 1 hour 15 minutes stopping time. It was this journey that brought me in close contact with some of New Zealand's incredible flora.

First up was *Celmisia spectabilis ssp. spectablis*, the Common Mountain Daisy, this was in abundance everywhere throughout the park, mostly at altitudes of 1200m to 1400m.

Forming large patches where it could, in wet gullies or drainages and on rocky sloes that received water. Heavily felted leaves on the reverse and large disc florets surrounded by white ray florets on scapes to about 30cm high completed the picture.

There was *Leptospermum scoparium, Phyllocladus alpinus* and *Podocarpus nivalis* in abundance throughout the mixed shrubland at a similar altitude to the *Celmisia.* Also in this mixed shrubland were two of the *Dracophyllum* species.

Right: *Dracophyllum filifolium* - a shrub or tree endemic to the North Island and Stewart Island growing 1-4 metres, it has filament like leaves.

Below: *Dracophyllum recurvum* - a prostrate to semi upright species to 1 metre which has thin recurved leaves and is prolific across Tongariro NP.

The genus *Dracophyllum* comprises some 61 species found in New Zealand, Australia, Lord Howe Island and New Caledonia. They range from cushion plants right through to tree like species reaching some 12 metres in height.

Continuing along the track I noticed, in the distance, some shimmering silver patches off the track; some investigation was warranted. I soon came across the wonderful Mountain Daisy, *Celmisia incana*.

It's a lovely mat-forming species which can be extensive with silvery leaves and the typical *Celmisia* inflorescence when flowering.

Celmisia incana plant – and in flower: image of plant in flower via iNaturalist creative commons law.

There was plenty to see both floristically and scenery wise as we carried on further and higher, soon we came across immense patches of Moss, these were from the genus *Racomitrium*, the exact genus I wasn't sure. Quite a sight to behold.

A nice mound of *Racomitrium* sp. In the foreground and extending off into the distance.

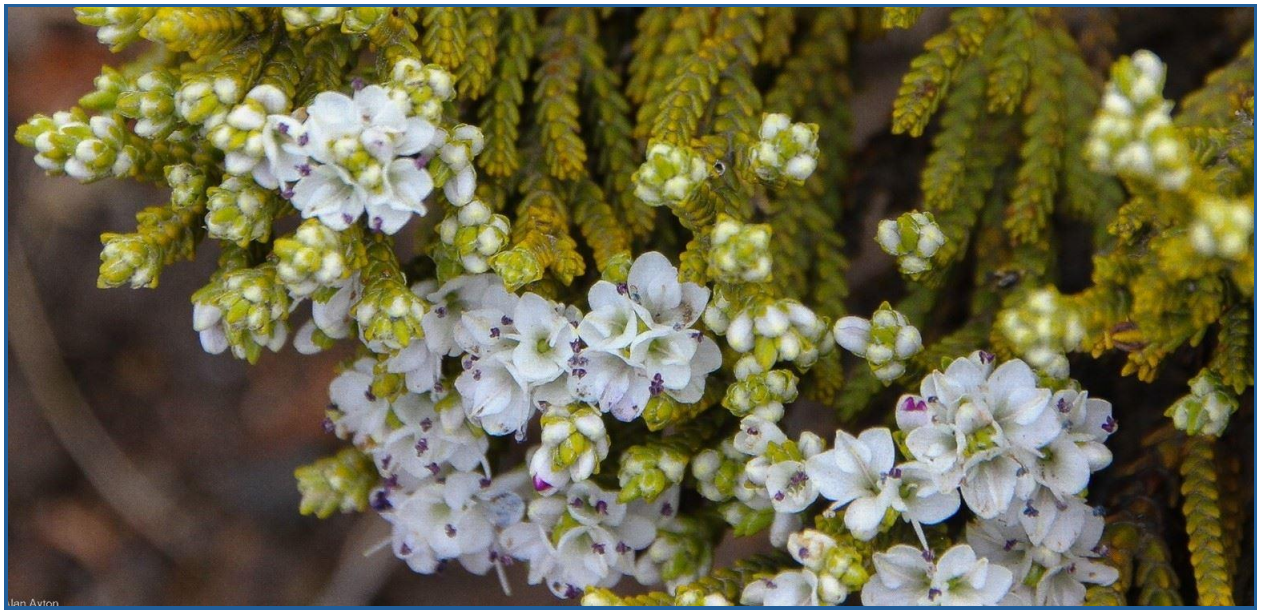
A little further along the scenery was beginning to change, we were now passing over extinct volcanic flows and heading into the higher plains before climbing up to the Tama Lakes.

Above: Edge of an extinct volcanic flow with a *Nothofagus* forest in the background.
Below: The plains opening just below the slopes to the high mountains with *Racomitrium* sp. Scattered throughout the plains.

As we continued across the plains we came across lots of *Wahlenbergia pygmaea*. With their small Campanula like pale blue bells shimmering in the slight breeze, most of these were only 20cm high if that. *Wahlenbergia* is a species familiar to me as there are many species spread out across Australia.

Across these plains there were lots of different *Hebe* species, *Podocarpus nivalis, Veronica* species, *Pimelea buxifolia, Dracophyllum* species, grasses and much more.

One that stood out to me in this landscape was *Veronica tetragona* ssp. *tetragona*, it is a bushy shrub bearing erect yellowish-green twigs. The branches are 2.8-3.5mm wide and square in cross-section which gives it an interesting appearance. The leaves are scale-like, 2-3.2mm long with white flowers in clusters at the tips.



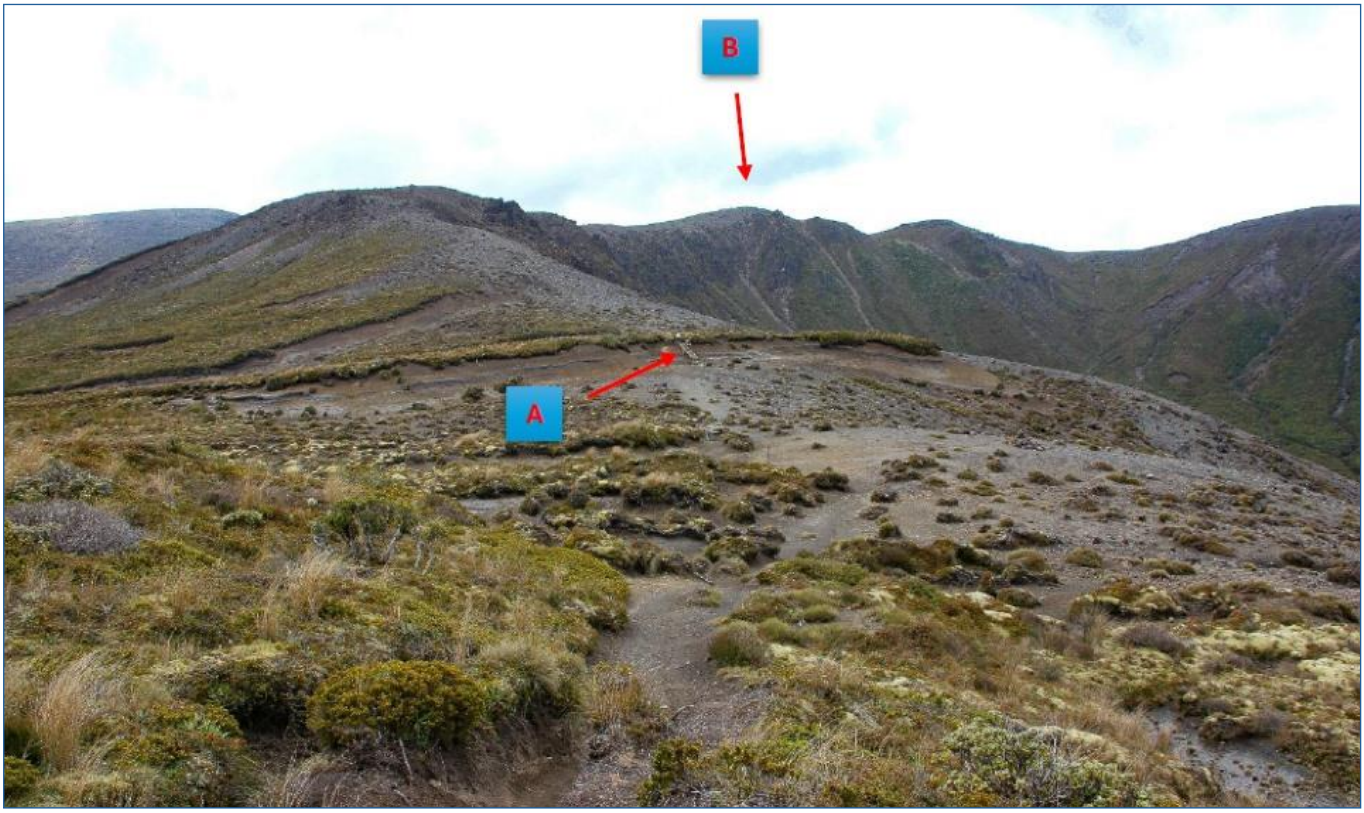
As the track started to rise, so did the wind. The clouds seemed to be very stubborn in providing views of the three active Volcanoes in the park as we gained altitude. It seems we were a day out as the previous day there was just a few fluffy high clouds providing excellent views, this we noticed on the drive up to the park!

Another excellent species that was starting to be noticed was *Brachyglottis bidwillii*. This leathery shrub growing to 1.5 metres tall can form extensive groves in subalpine areas. It has leaves that are thick and leathery, oval, dark green and with whiteish tan down underneath. Flowers small creamy white, clustered at tips of branches, quickly becoming dry and papery. An outstanding shrub that stood out in the landscape.

Brachyglottis bidwillii

As we continued to ascend the scenery was rapidly changing, the Lower Tama lake was coming into view, and it did not disappoint. A beautiful aqua blue lake surrounded by steep cliffs with the active volcano Mount Ruapehu (2797 metres) rising in the background. Unfortunately, the clouds obscured the view. Below - Lower Tama Lake.

We were now starting to climb higher from Lower Tama Lake into an apparently barren scree/boulder field, but we know better now (more on this a bit later!)



In the above photo: point A indicates a ladder where we crossed onto a small ridge line leading towards the steep uphill climb that faced us, it doesn't look that bad in this photo but have a look at the photo below! Point B indicates where we were going too, a scree/boulder field with outstanding views of the Upper Tama Lake and the active volcanoes Mt. Ngauruhoe and Mt. Tongariro and Mt. Ruapehue, alas all in cloud!

As previously alluded to, once in the seemingly barren scree/boulder field (see next photo), this was where the some of the floral treasures started to appear.

It took a little while but soon I was starting to see things that I couldn't see before, the main reason being I was about to step on the first species I saw in this environment, *Raoulia albosericea,* the Volcanic plateau *Raoulia*, after that my eyes had adjusted and was starting to other species such as *Veronica hookeriana*, *Euphrasia cuneata, Ranunculus nivicola* and the sublime *Veronica spathulata*. We will start with *Raoulia albosericea* considering I nearly walked right over it! This *Raoulia* or Scabweed that they are commonly known as is a supreme species that has selected for its environment. If there is one way to blend in so you are not seen, then this could be it.

Right: A good view of the small Asteraceae flowers with its papery scales of *Raoulia albosericea,* Also, note the silvery leaves which can be seen to great effect below blending in with the surrounding habitat.

This mat forming species which is only found on the Volcanic plateau here in the North Island of New Zealand is a master in disguising itself with the surrounding landscape, both surfaces of the very small leaves are covered in tomentum giving the plant a snow white-silvery appearance which is difficult to spot in Fellfield and Boulder Field/scree habitats where it is found between 1000 -1800m altitude. The small whitish flowers are surrounded by papery scales orange to brown in colour. Luck would have it as there were a couple starting to flower while we were here, simply put: an outstanding plant that most people were just bypassing!

Ranunculus nivicola – the Mount Taranaki Buttercup

Also in this unforgiving landscape was the Mount Taranaki Buttercup, although long finished flowering in this region, tufts of green leaves and fading seed heads were all that were left to show its presence. An outstanding Buttercup which provides a splash of colour in the landscape. *Ranunculus nivicola* can be found in the North Island in mountainous areas, It can be 5-30cm tall depending on its location and exposure, it flowers from September through November.

Ranunculus nivicola - photo by Blanchon Catherine via iNaturalist creative commons law.

Another plant that stood out in this habitat was *Euphrasia cuneata*, the North Island Eyebright, it is widespread across the Mountains in the north island and predominately coastal in the northeast of the South Island. It grows 10-60cm tall and is usually only 20cm or less in the alpine zones. It has widely spaced glabrous leaves which are often brownish in colour and wedge shape. The inflorescences are normally much branched but generally singular in the alpine zone with white 3 lobed flowers containing yellow splotches and purplish striations (see below).

Euphrasia cuneata - this species can be very variable across its range.

It was surprising to see such plant treasures in this landscape because as you looked around at the greater landscape the impression you got was of barrenness, although it was an amazing landscape with its active and extinct volcanoes, old lava flows, fellfields, boulder fields, scree fields and many other fascinating features unique to this area. The next photo shows the Upper Tama Lake and its surrounding landscape including the active Mt. Ngauruhoe in cloud to the left.

We then came across *Veronica spathulata*, it is a low or mat-forming sub-shrub to 10cm tall. The stems are prostrate to ascending and occasionally erect. The leaves are small and vary up to 12 x 12mm in size and hairy on all surfaces, predominately green but I did see a few brownish-purplish plants in the area. Flowers are white and occasionally a few pale lavender ones can be seen as well. Below: *Veronica spathulata*.

Above: Flowers of *Veronica spathulata* with its distinct leaves with hairy surfaces.

Another excellent example wedged between rocks with brownish-purple leaves.

V. spathulata with the brown-purple leaves and a few pinkish-lavender flowers amongst the scree field.

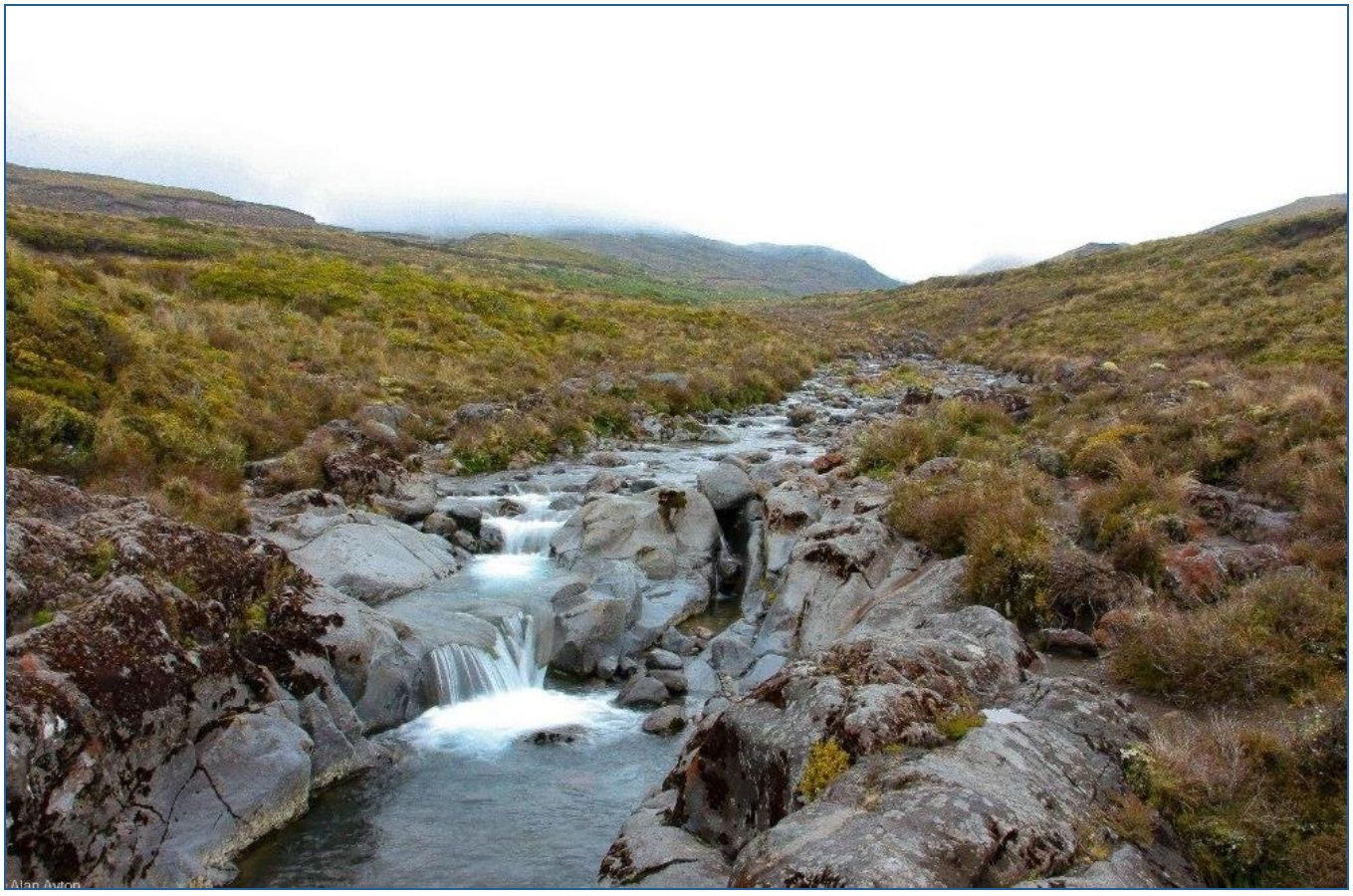
These darker coloured forms were blending into their habitat extremely well.

A common sight, of *Veronica spathulata* plants growing amongst the rocks.

Left: Small tight buns or mats to about 25cm in width amongst the scree, this species is found on the Volcanic plateau in the North Island only between altitudes of 1100 -1800 metres on loose stony debris of shingle, scoria and fellfields. *Veronica spathulata* is a definite favourite of mine.

It was hard to leave this area with its treasures, but it was time to start our trek back to our camp. There was a way to go and included a slightly different return through some wonderful wet rainforests dripping in water and greenery.

The clearest view we got of Mt. Ngauruhoe.



The Wairere stream flowing through scrubland, tussock land and sedge lands.

The wonderful rainforests of Tongariro National Park.

This rainforest contained many ferns amongst other things, but a standout was the remarkable Umbrella fern – *Sticherus cunninghamii.* See below.

The distinctive fronds of *Sticherus cunninghamii,* the Umbrella Fern.

This New Zealand endemic is widespread and common, though often absent from large parts of the eastern side of the two islands. It grows in patches from a long creeping rhizome, which is much branched and is covered with dark brown scales. The fronds characteristically rise into two or three tiers of umbrella like leaves. This can be found in coastal to montane situations normally in forests where it can be the dominant ground cover. Certainly, a standout species.

Walking back to the campervan through parts of this rainforest which survived the massive Taupo eruption of 183AD, we came across Beech forest between 950-1530 metres which included the main tree species of Mountain Beech- *Nothofagus solandri* var. *cliffortioides*, Red Beech - *Nothofagus fusca* and Silver Beech – *Nothofagus menziesii.*

Beech Forest

Passing through this forest it started to change at about the 1000 metre altitude as it transitioned into a Podocarp Forest. The main trees seen in this habitat include the Rimu – *Dacrydium cupressinum*, White Pine – *Dacrycarpus dacrydioides*, Black Pine – *Prumnopitys taxifolia* and Miro – *Prumnopitys ferruginea*.

Understory of the cool wet, rain forest.

It was a joy to experience the cool wet rainforests as we neared the end of our walk. This was a fantastic walk albeit in overcast rainy conditions which didn't deter us from completing it. After spending nearly seven hours out in the park it was time to move on to our next adventure in New Zealand. This park is renowned for many things but especially the Tongariro Alpine Crossing which is considered one of the best hikes that can be taken anywhere, hopefully one day for us!

Taranaki Falls

Mt. Ngauruhoe's active volcanic cone in all its glory.

In short – A must for anyone interested in this landscape or its outstanding flora. A.A.

New distributions for the genus Viola in Chile: sections Rosulatae & Ericoidium

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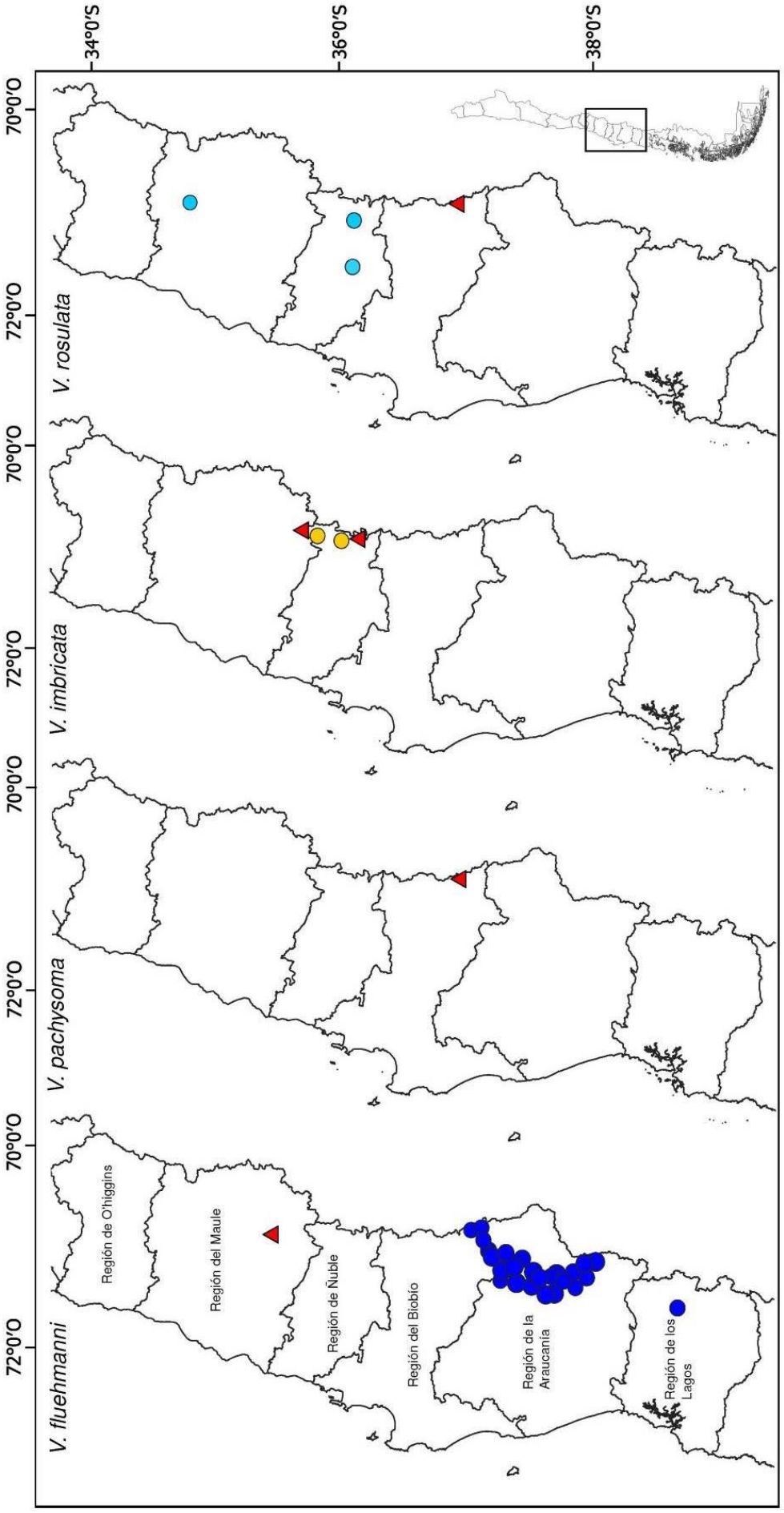
Abstract

New localities for the genus *Viola* are described. These specimens are found in difficult-to-access locations in the Andes Mountains of south-central Chile. Specimens of *Viola rosulata* (Poepp. & Endl) are reported south of Region VIII. The last collections of the species are equidistant, 39 kilometres to the north, specifically in Laguna del Laja National Park. This is the first record for Chile of *Viola pachysoma* (Sheader & J.M. Watson), and the population is found 2 km east of the Argentine border near Laguna Las Mellizas. For the recently described *Viola imbricata* (K. Menegoz & J.L. Celis-Diez), the distribution of this species is extended northeastward to approximately 110 km from the two populations described for the Maule Region (Cordón de la Quemada and Cerro El Toro). Finally, the distribution of *Viola fluehmannii* (Phil. It is extended to Region VII where the population is located approximately 139 km from its last collection to the south in the town of Antuco.

Introduction

The genus *Viola* is represented in Chile by 81 taxa (Rodriguez et al. 2019); based on the number of species, *Viola* is the fifth richest Chilean genus (Marticorena & Quezada, 1985), cited by Belov et al. (2010). The genus is quite cryptic, due to its limited research, its small size, and its inaccessible localities, considering the species found in the Andes Mountains. The phenotype of these high Andean species is mostly known as "rosulate," given the arrangement of the leaves on the plant.

Currently, these violas are included in the subgenus Neoandinum and grouped into eleven sections, totalling one hundred and thirty-nine species endemic to South America (Marcussen et al. 2024).



Maps of Chilean regions and the distribution of Violas according to collections deposited in the herbarium of the University of Concepcion (CONC). New distribution symbols in red.

Maps rotated for reasons of scale. Orientation of maps:

E

N S

W

Study Areas and Materials

For ***Viola rosulata*** Poepp. & Endl, the surveyed area corresponds to Alto Biobío, specifically to the Butalelbun locality, near the northern slope of the Copahue volcano and technically known as a Copahue postglacial flow (Gonzalez Diaz, 2005).

Viola rosulata: Polymorphism in the species can be appreciated since the colour of the flowers is white to pale purple.

The plant phenotype of *Viola rosulata* presents as flattened rosettes, solitary or a few closely clustered, 3 to 9 cm wide, growing from a thin taproot. The leaves are olive-green to tawny-brown, elliptic-spatulate, tapering to a long, broad petiole, dark linear glandular below, and briefly ciliated white. The flowers are arranged in a ring at the leaf tip, up to 1.2 cm wide, white, sometimes with violet-blue basal veins and a yellow eye. It grows preferentially in volcanic sands of moderate depth, often in rocky habitats adjacent to basalt outcrops. It is found in an altitudinal range from 1,700 to 3,200 m. The species was described in 1838 by Edward Poeppig and Johann Georg Edlinger, based on a sample collected in the “Andes of Antuco” by E. Poeppig himself during his stay in Antuco in the spring of 1828.
Contemporary records indicate at least two populations of this species: Shangri La, in Nevados de Chillán (Ñuble) with few individuals Watson & Flores, and on the road to the Pichachen pass in Laguna del Laja National Park.

Viola pachysoma Sheader & J.M. Watson, a plant described from the province of Neuquén, localities of Caviahue-Copahue, Argentina. Described as a solitary plant, sometimes forming dense cushions rarely with many rosettes. Rosettes densely imbricated at the base, frequently columnar, usually cryptic, but sometimes green, somewhat depressed toward the centre of the face. Leaves are spatulate, ca. 1-2.5 cm, blade 5.4-6.5 × 5-6.5 mm, entire, broadly ovate to suborbicular, rarely wider than long, leathery-succulent, minutely apiculate at the tip, margin 0.5 mm wide, thinly cartilaginous, pale translucent. Flowers 1 cm tall × 1 cm wide, axial, solitary, forming a dense ring around and somewhat included within the upper circumference of the rosette. Calyx 6–7.8 mm; sepals unequal, triangular, acuminate. Corolla glabrous, white to pale whitish-violet; presence of a central line or lines on the upper petals. Apex rounded to rounded-obtuse.

Both species coexist at 2,000 metres above sea level; the *V. rosulata* population is less than fifty individuals. Finding the two species sharing their habitat and flowering synchronously at the time of the survey (December) raises the possibility of finding hybrids. The *V. pachysoma* population is larger and more dispersed in the area, with numbers exceeding 100 plants. The surveyed area corroborates the hypothesis of Watson et al. (2018) that populations of this species were found west of the Copahue volcano.

Viola pachysoma: Individuals and the columnar shape that the plant experiences in more developed stages can be seen.

***Viola imbricata*.** Perennial, glabrous, with a basal caudex. Densely imbricated leaves arranged in a columnar or domed rosette, 3-7 cm diameter x 2.7-8 cm high. Attenuate leaves on a 1.5-1.9 cm long petiole, blade 5-5.7 × 5.7-7 mm, broadly obovate, ovate, suborbicular or rhomboid, margin pale-translucent, narrow, thin-cartilaginous. Flowers 5-7 mm high x 6.2-8 mm wide, axial, solitary, forming a dense ring. Pedicel 13-13.5 mm; sepals 12-13.5 × 1.2 mm, equal, entire, lanceolate, margin translucent-cartilaginous. Corolla yellow with dense discontinuous radial venation on the lower petal and occasionally on the basal half of the lateral petals, upper petals 3.5-4.5 x 1.6-2 mm, obovate, cuneate, lateral petals 4.5-5.5 x 2.5 mm, suborbicular, cuneate to the base, long, white hairy at the base, lower petal 6-6.8 x 3-3.4 mm, obtriangular, with short barbs at the spur mouth, spur 1-1.8 x 0.9-2 mm, cylindrical-bulbous, briefly protuberant; stamens 5, free; style 2.7-3 mm, subgeniculate, clavate, stigma with a small circular frontal opening between the lobes of the style crest, this ca. 0.8 x 1 mm; Trilobed lateral lobes on each side of the style head, entire, broad, long-acuminate, curved upwards; apical central lobe, triangularly acuminate, entire, short, somewhat curved.

Viola imbricata: Specimen apparently with more than one growing season showing notable development.

The new population of *V. imbricata* is located approximately 57 km further north near Radal National Park, specifically Fundo El Guanaco at 3,010 metres above sea level in Cerro Manantial Pelado. The population in the area is abundant and equal to or greater than that reported in Cerro Toro by Menegoz et al.

(2025). New analyses and surveys among the indicated sites should be considered to ensure conservation proposals according to IUCN
criteria.

The habitat of *V. fluehmannii* is the *Araucaria araucana* understory, and the majority of collections are in Araucania Region and, most recently, in Laguna del Laja National Park in Biobio Region. A new population has been observed Lagunas Verdes, in the Achibueno Canyon at 2,200 m, approximatly 174 km north of Laguna del Laja.

V. fluehmannii is a species of viola associated with the understory of *Araucaria araucana*. It is resistant to low temperatures and has great ornamental value.

Viola fluehmannii, perennial, very branched, semi-prostrate, 20 cm tall x up to 30 cm in diameter, stems covered by leaves. Leaves sessile, glabrous, fleshy, with numerous reddish glands, somewhat elongated, on the underside, alternate; blade 5-8 x 1-1.5 mm, narrow to linear-spatulate, obtuse or rounded, entire, base narrowed into a pseudopetiole of ca. 2 mm. Sepals with glands; large petals, white and lilac, sometimes slightly pink, arranged at the apex of the stems, somewhat unequal to each other, the lower one strongly marked with dark violet veins; ovary 1-1.5 mm, conical, style somewhat straight, stylar crest formed by two filiform, lateral appendages, patent or somewhat deflexed, stigma rostral, frontal. Fruit: a three-carpellate capsule. It flowers in spring and summer.

Comments

These new localities of *Viola* spp in Chile are from recent surveys in herbarium collections at the University of Concepción (CONC) and the publication of a Field Guide to Violas of Chile, to be published this year.

References

Belov, M, P. Gómez & S. Hahn. (2010). Relaciones de temperaturas en especies de Viola de alta montaña en Chile central.
Chloris Chilensis Año 13 Nº 2.

González Díaz, E.F (2005). Geomorfología de la región del volcán Copahue y sus adyacencias (centro-oeste del Neuquén). Rev. Asoc. Geol. Argent. v.60 n.1

Marcussen, T., Ballard, H.E., Danihelka, J., Flores, A., Nicola, M & J.M.Watson (2022). Revised Phylogenetic Classification for Viola (Violaceae). Plants 11(17):2224 https://doi.org/10.3390/plants11172224

Marticorena, C. & M. Quezada. (1985). Catálogo de la flora vascular de Chile. Gayana Botánica 42: 5-157.

Rodríguez, R & A.Marticorena (2019). Catálogo de las Plantas Vasculares de Chile. Editorial Universidad de Concepción. 424 p.

Watson, J.M., Flores, A., Sheader, M & Anna-Liisa Sheader. (2018). *Viola pachysoma* (Violaceae), a new name for a rosulate species endemic to the Andes of Argentinian Patagonia. Phytotaxa 382 (1): 113–124.

Watson, J.M.,; Flores, A.R., Nicola, M.V., Marcussen, T. (2021). Viola subgenus Andinium, Preliminary Monograph; Scottish Rock Garden Club with International Rock Gardener: Glasgow, UK, 2021; pp.1–215. www.srgc.net/documents/publications/Viola%20monograph.pdf