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This month in IRG 124 – Connor Smith on dwarf conifers for the rock garden; John and Anita Watson demystify more South American rosulate violas, and disabuse us of the eternal delights of the plant-hunting life. Lastly, Dr Martin Sheader writes of the *ourisia* hybrids using South American species which he made with his late wife Anna-Liisa. Martin and Anna-Liisa were awarded the highest honour that can be bestowed by the Alpine Garden Society in November 2019 – the Lyttel Trophy, for individuals who have made a substantial contribution to the knowledge of alpine plants.

There are no flower shows on at present as the UK, and many other countries, are locked down because of the Coronavirus pandemic. Trying and testing times for us all – the SRGC is mindful of the health and safety of our members and the general public and so SRGC events have all been cancelled for the foreseeable future, including the Alpines '21 Conference. The virus is everywhere and no respecter of persons. We have been shocked to learn that Martin Sheader has been very ill with the Covid-19 virus and we wish him a speedy return to full health, his three sons and his loving family. We hope you all keep safe and healthy.

Cover photo: *Ourisia microphylla* in the wild in Chile - photo Martin Sheader.

---SRGC NEWS---

The Royal Horticultural Society announced its People Awards for 2020 on 6th April

The Veitch Memorial Medal, an international award honouring individuals for their exceptional involvement in the advancement of the science, art and practice of horticulture, has been awarded to J. Ian Young of SRGC. Alpine bulb expert Ian is a longstanding member and former President of the Scottish Rock Garden Club and was with his wife, Margaret (IRG Editor) show secretary in Aberdeen for over twenty years and the two were awarded the Queen Elizabeth the Queen Mother Medal by the Royal Caledonian Horticultural Society - the Caley - in 2007. Ian was a member of the RHS Joint Rock Garden Plant Committee for many years and is an artist, author, broadcaster, video maker and speaker, both in the UK and internationally, committed to raising the profile of alpine and rock garden plants. He has also written his Bulb Log Diary every week since 2003 and is a member of the IRG Team of course! The other recipients of the RHS Awards can be seen here. We are especially pleased to applaud the President of the Alpine Garden Society, Chris Bailes, RHS stalwart Jim Gardiner and the veteran TV gardener, Jim MColl on being awarded the Victoria Medal of Honour, the RHS' highest award. Two of those made Associates of Honour are Peter Sandwell, who had a long association with horticulture for Dundee Council and for the "Wildside" gardener, the inspirational Keith Wiley. Congratulations to all those given Awards!

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International Rock Garden Conference 2021& CORONAVIRUS (SARS-COV-2 / COVID-19)

Following careful consideration the decision to cancel the "Alpines 2021" conference has been taken, due to the ongoing coronavirus pandemic. We do this with a heavy heart, and hope you understand this was not an easy decision, but it is our belief that the effects of this virus will be felt for a considerable time. International travel, which is an essential part of any international conference is also likely to be curtailed through next year at least. Therefore, cancellation at this time is in the best interests of everyone's health and wellbeing. We are very disappointed but we hope we can all meet again when circumstances permit. S.R.G.C.
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True dwarf conifers for the rock garden – Connor Smith

'Now, the supreme test of a rock gardener's craft lies in the placing of his shrubs' : Reginald Farrar, 1907.

People are often prewarned that I am a 'Conifer Person'. This forewarning is possibly warranted as much pointing and gesticulating at "large green blobs of various shapes in sizes" is one of my areas of interest. However, in recent years I have done my fair share of pointing to the vast array of "small green blobs of various shapes in sizes" those being alpine plants. Conifers take a lot more convincing to get people to like them. Why is it so difficult to get people excited in a plant group that evolved plant defence against dinosaur herbivory (*Araucaria*), medicinal properties against cancer (*Taxus*), parasitism in a rare case (*Parasitaxus usta*), the largest living organism in the world (*Sequioadendron giganteum*) and lifespans of up to 4,000 years old (*Pinus aristata* or *Fitzroya cupressoidies*).
This lack of conifer interest is understandable from a British viewpoint. We have a distinct lack of native conifers to the British lands – 3 species being *Juniperus communis* (Common Juniper)*, Pinus sylvestris* (Scot's Pine; although many are of Germany prodigy after the depletion of timber during World War I and II) and *Taxus baccata* (Yew)*. Larix* (Common Larch) is often mistaken to be native but is an archaeophyte - an exotic brought over in the 16th century - to improve the timber production.

Conifers have a bad reputation in the rock garden. They are often planted as 'Dwarfs' which is probably the most misused phrase in the conifer world. Most of them outgrow their space much faster than anticipated and are subsequently removed. If you speak with alpine gardeners, they either like the conifers for the shade and shelter they provide or are wanting rid of them to rebalance the alpine landscape. We have the luxury of being able to grow an incredible array of conifers in a British climate and we should make the most of it!

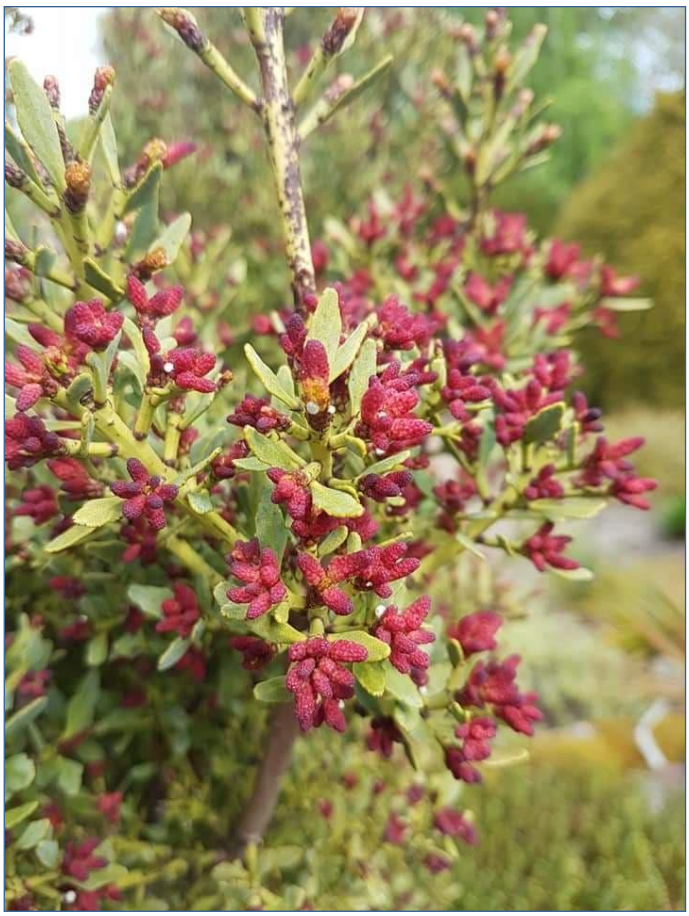
I was recently doing some conifer verification work at St. Andrews botanic garden in Scotland. The team wanted to put a management plan together for the conifers in the rock garden which had become overgrown in places and wondered if I could help. I was happy the garden team had the foresight to see the problem and start to structure a system to keep all valuable accessions.
One of the most important aspects of removing conifers or any large plants for that matter is succession. Rock gardens are dynamic areas which need to be rebalanced frequently, one of my small annoyances is the sudden removal of many conifers all at once and subsequent mass planting of the next generation. This destroys the skeleton maturity of the garden, instead of forming tiers of conifers which are the same age. This is not how you see it in nature but that of a plantation.

Some of the type species conifers can be utilised in the rock garden to provide evergreen structure to the garden. They give height to the rock garden, create hidden areas and provide much-needed interest in the colder months. The foliage can complement the rock work enhancing the natural look.
'The key is simply the one word, proportion' (Farrer 1907)

The List

Microcachrys tetragona is a small Tasmanian conifer which is the only one in the genus. The name is derived from two Greek words meaning 'Small Catkin' with the species epithet *tetragona* meaning '4-angled' regarding the leaf arrangement. The aptly named strawberry pine forms picturesque glowing red cones which are edible. The cones taste to me more like a raspberry. This low growing Podocarpaceae member creeps along the rocks and stays very compact. It is slow-growing and looks best on the corner of a bed. Cuttings taken in spring or autumn using semi-ripe shoots 5cm in length are the easiest method of propagation for this species.

Microcachrys tetragona



One of the more unusual conifers is the New Zealand *Phyllocladus alpinus* syn*. Phyllocladus trichomanoides* var*. alpinus.* It does not look like a conifer at all. The interesting foliage of the 'Celery pine' looks like the propellers of submarine ships, these are modified stems called phylloclades. This group of conifers preform photosynthesis from the stems. It forms a small upright pyramid but is very slow growing. It was showing off this year as it glowed red with the small fleshy arils, enjoying the warmer weather we had in Edinburgh (a record-breaking 31°C) unlike much of the other New Zealand flora.

Despite how unusual this plant is I managed to get it for only £7.99 which came from Derek Spicer's Leicestershire-based Kilworth Conifers. I have never successfully rooted this notoriously difficult plant from cuttings, cuttings in winter will have lacked sufficient light (particularly in Scotland) so cuttings in summer may be more successful, I will be trying to layer this year also. Fingers crossed!

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Although not a conifer (!) the living fossil *Gingko biloba* must find a space in the garden. The cultivar 'Troll' is the best, compact cultivar that stays small for the longest time (for me). I have seen a 20+-year-old specimen in Germany which was around 50cm/20inches tall and wide. The attractive fan leaves are a strong deep green before turning a butter-yellow in autumn.

Ginko biloba 'Troll' - photo, Missouri Botanic Garden.

Ginko biloba - golden fall foliage – photo SRGC Forum.

Not a TRUE DWARF but *Sciadopitys verticillata* (left) has a very shallow root system so is a good addition to a trough or a rock garden for a good number of years. Although it does grow large it is relatively slow growing (10years to 6ft/ 1.8m is a max, we tend to not get this fast in Britain). They can be propagated by cuttings by are challenging so are often grafted. The elegant umbrella foliage of whorls comes in shades of green and habitats with different cultivars.
Photo SRGC Forum.

Chamaecyparis obtusa cultivars form great dwarf cushions. There are many excellent examples to pick but one of my favourites is *Chamaecyparis obtusa* 'Minima' (above right) which has found a home in a trough at RBGE. Its compact shape forms a beautiful dense mound of light green.

Abies balsamea ‘Nana’ is a tough plant which originates from the USA, being described in 1866. It has been an iconic plant in many a rock garden, not as exciting as the other plants on the list. However, it is easy to come by the plant, which is affordable, easy to care for: it “does what it says on the tin”. Does well in a drier location although this is seldom found in Scotland !

Juniperus horizontalis ‘Neumann’ is a tiny dwarf conifer originating from Zu Jeddeloh nursery (the nursery I worked at in Germany). I never saw this plant in Germany and presumed it had been lost commercially and could only be found in the gardens of collectors. Thanks to the help of Facebook I recently saw a photo of the plant and put it into a conifer group which I help coordinate called ‘Planet Conifer’. I was assisted by Lawrence Peet who informed me that Don Peace and David Richards have shown the plants. David Richards exhibited a lush green form of this plant in 2014 at AGS Midland Show. I recommend this as one of the most dwarf junipers forms (forms seem rather variable as does the syn. ‘Blue Pygmy’) I have seen.

Juniperus horizontalis ‘Neumann’ - exhibited by David Richards – photo Jon Evans.

Pinus strobus ‘Mini Twists’ is a small pine tree forming a sphere with twisted glaucous foliage with silver bark which exudes a metallic sheen. We (in Britain) tend to struggle with some of the North American five-needle pines such as *Pinus strobus* as it is susceptible to a fungal disease, so a dry spot is required to reduce the chance of infection. A tip to keep pines small is to break the central bud with your thumbnail to encourage a fuller, more compact growth.*****

***** This is known as “candling” because the pine makes new growths which are candle-shaped and can easily be snapped by hand to reduce their size and so restrict the size of new growth without leaving any unsightly cut marks.

Pinus heldreichii ‘Schmidtii’ comes from a naturally dwarfed tree found in the Bosnian forests by a Mr Schmidt in the 1920s. The sharp green foliage grows around an inch a year. More dramatic than some of the *Pinus mugo* cultivars although they allow a more naturalistic look to the rock garden. It looks best with age, forming into a sea urchin nestled between the rocks.

<u>Important factors to consider</u>

Grafted conifers –

Grafted dwarf conifers can be a perfect addition to a trough, perfectly unique if taken from a witches’ broom. A ‘witches’ broom’ originally comes from the German word ‘Hexenbesen’, when you couldn’t explain how something had happen, Witches! It provides smaller alternatives to the type species for example - If the normal species grows 8cm per year some of the witches’ brooms only grow 4cm per year allowing them to stay smaller. The position for grafting is an important factor for me. I much prefer low grafts on dwarf conifers as I think top grafting on 12inchs or higher looks like a lollypop and often require more protection from the wind.

Positioning –

A sunny position is advised for many conifers as they dislike winter wet. As a rule, I would only put upright form conifers on edges of paths as I have seen may grow too big for their positions. Use pendulous foliage conifers on the edge of raised beds or to accentuate water features.

Trough –

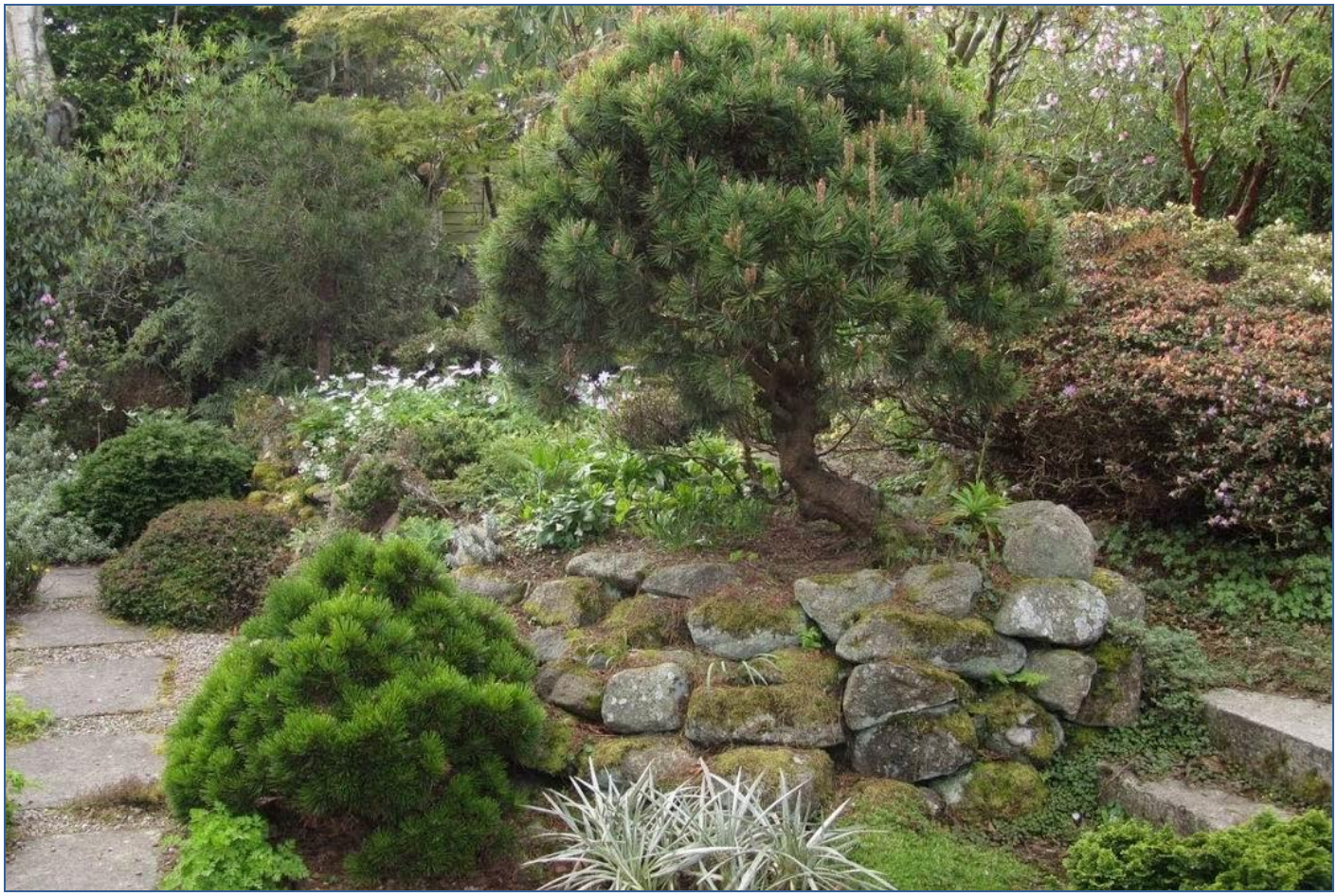
Planting conifers in troughs seem to eventually cause the surrounding plants to suffer as the conifer roots expand, taking up all the water. Great care should be taken in selecting the plants which are placed with the conifer to provide the best combination. When in America earlier in the summer (2019) to give a talk for the American conifer society I saw many troughs which were planted with

Lewisia which provided an alluring pairing. The dense roots provided aid in helping the *Lewisia* from rotting off in the wet winter months.

To Conclude –
Plant in a position with a view to the future; conifers are long-lived and must be planted with this in mind. They will always grow larger than stated on the plant label so plant according. Conifers come in a range of forms, this needs to be considered to enhance the garden, rock work or paths within the garden.

Photos by Connor Smith, unless stated otherwise.

References
FARRAR, R. (1907) *Alpines and Bog-plants.* London. Edward Arnold.



Conifers in the garden of the IRG Editor in Aberdeen, North East Scotland - photo J.I. Young.

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---Scottish Rock Podcast---

The Scottish Rock Garden Club is pleased to publicise a new project - **This is the Scottish Rock Podcast**, the official podcast of The Scottish Rock Garden Club. Grateful thanks are due to Connor Smith for his work on this initiative. We are delighted to add these podcasts to the range of free access resources we offer to all from SRGC.net - such as the Bulb Logs, this IRG monthly e-magazine and so much more - and we hope plant lovers will enjoy the podcasts!
Reach the podcasts HERE - or from your usual podcast provider.
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***Viola atropurpurea* it's not. Introducing *Viola turritella*, yet another case of mistaken identity in the rosulate ('rossie') violas (section *Andinium* W. Becker).**

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A baker's dozen of rossie bloopers. To err is human ... but not scientific!

"*The function of an expert is not to be more right than other people*, *but to be wrong for more sophisticated reasons*." David Butler.

Fig.1: The 14 misidentifications described here were spread out along the geographical area between the two red horizontal lines.

We can say that Claudio Gay (1846) probably cocked the gun in his Flora, the first such for Chile, by misunderstanding that *Viola truncata* [Fig.6] of 1834 was a variant of very dissimilar *V. congesta* [Fig.2], published a year earlier. But Karl Reiche (1893, 1895) certainly pulled the trigger, first in an exhaustive monograph of the Chilean violas and then his own Flora of Chile, which updated Gay's. He not only continued the latter's mix-up, but added a couple of his own. Most notable (or infamous) was reversing the identities of the same *V. congesta* with *V. volcanica* [Fig.4], both very common species, this despite Hooker having clearly described and drawn the differences between them in his original 1833 protologue [Figs.3, 5]. The confusion Reiche sowed by this persisted throughout botanical literature until our dear friend and fellow violaholic, the late Kim Blaxland, pointed out the error to us in 2005. Got the irony? Kim, an Australian amateur naturalist resident in North America, gets it right when all the professional academic botanists and others, living where the two in question grow, erred for 172 years! Longer than that actually, as it cost us blood, sweat and tears to finally pull everyone into line at last. But to continue with Reiche's lesser faux pas, which only came to light a few years ago when we were looking into a pair of new annuals. In fact it was revealed in this very journal when we made them known to the world (Watson & Flores 2018b). He noted Leybold's *Viola rhombifolia* of 1859 as inhabiting the Andes of both Santiago, the type location, and northern Chile, whereas in fact the plants from the two regions are quite distinct, allowing us to name the latter as *V. marcelorosasii* [Fig.7] for the colleague who brought it to our attention. Thus those two great historical figures kick-started a series of such taxonomic fiascos covering nearly half the length of Chile and western Argentina combined [Fig.1]. Indeed, if we take into account the mess called Hippeastrinae that Nico García is trying to sort out (Watson 2019b), they're almost certainly continuing to this day.

Fig.2: Probably the most significant long-term error of them all - Reiche's publishing of *V. congesta* as *V. volcanica* here, and vice versa. (29 Dec 2002. ARF)

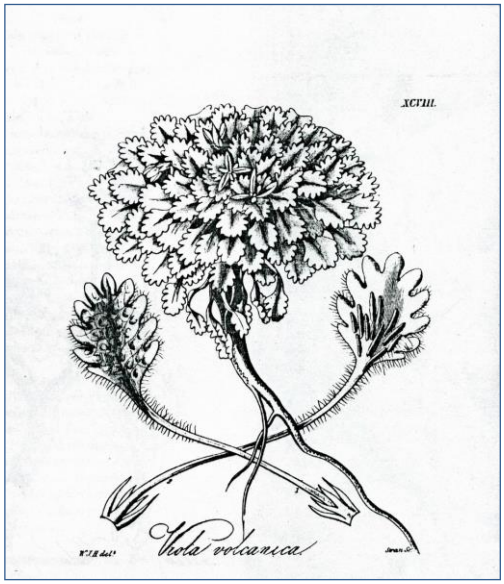

Fig.3: Hooker's drawing in the type publication, showing clearly the distinct leaf characteristics of *V. volcanica*, including the long foliar glands.

Fig.4: *Viola congesta*, the other half of Reiche's major misconception. (18 Dec 2013. JMW)

Fig.5: Hooker's comparative drawing of *V. congesta* in the same publication. Note the full cover of small underleaf glands and others between the crenula sinuses.

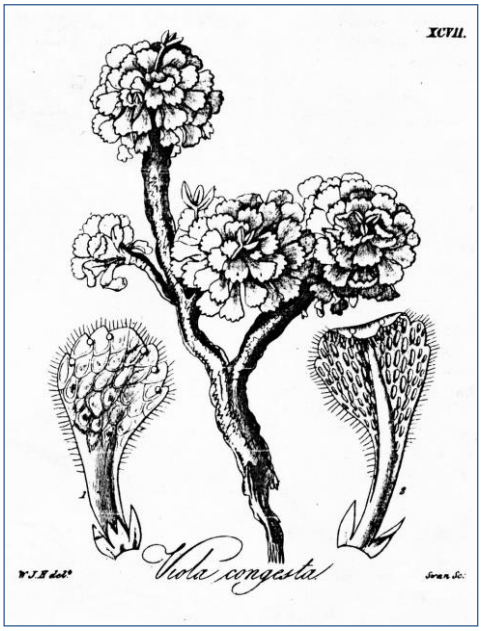

Fig.6: 1845, the beginning of the rot! *Viola truncata*, which the renowned French botanist in Chile, Claudio Gay, took for a form of *V. congesta.* (7 Jan 2013. ARF)

Fig.7: Our *Viola marcelorosasii* (published in 2018) which we owe to a misidentification of it by Reiche in the second half of the 19th Century.
(21 Aug 2017. JMW)

Fig.8: *Viola farkasiana* was the first we described in the IRG. Up to then it had been taken by all and sundry as a variant of *V. congesta*. (24 Jan 2008. ARF)

Moving on in time, we can't exactly point the finger at Reiche for confusing our *V*. *farkasiana* [Fig.8] (Watson & Flores 2018a) with relatively similar *V*. *congesta*, since nobody from time immemorial, not least ourselves for a good few years, realised that there was any critical difference between them. Nor can we say when the first specimen was collected. Yes, that damned unelusive *V*. *congesta* again for the third time: it's got a lot to answer for.

Fig.9: As a wrong stab in the dark, the great Becker identified this as the mysterious *V. portulacea*, thus leaving it for us to name as new *V. beckeriana.* (17 Dec 2010. JMW)

The gaffer's gaffe

When it comes to the next muddle we can name names again though: Wilhelm Becker of Berlin, the prime Homer of *Viola*, nodded over a rosulate species for about the first and only time. *V*. *portulacea* was published by Leybold in 1865. Quite low down, a bit to south of Santiago, he hopped out of his horse-drawn passenger coach and grabbed a single specimen out of flower before rushing back so as not to miss his journey over the pass into Argentina. The species has never been seen since, despite careful searching at its type site (pers. obs.). But he'd first observed it in bloom earlier in passing, and used this visual to describe some, but not all, features of the flower. In the late 1920s Becker was sent some viola specimens collected by an Argentinian correspondent. Among them was one found just over the top of that same pass from Chile. To Becker (1928) it matched *V*. *portulacea*, and he noted it as such, believing he'd expanded its distribution by good few kilometres to the east and nearly a couple of thousand metres higher up in the Andes. This record was subsequently faithfully recorded for the flora of Argentina until a short while ago. By chance we came upon photos from that very area published on the Internet at the end of 2008, which had been taken by a group of Swiss botanists and horticulturalists from Lauteret during a tour. Clearly this was Becker's plant, but no way was it *V*. *portulacea* by a long chalk. We therefore christened it *V*. *beckeriana* [Fig.9] to commemorate the Great Man and published it (Watson & Flores 2013c).

The champ ... or chump?

Now we come to the all-time, undisputed king of these embarrassing lapses, the late Ricardo Rossow (1988), with five to his credit in the *Viola* entry for Flora Patagonica. This friend of ours can't reasonably be hauled over the coals, however, as he was called on at the last minute to 'do the job' and not given nearly enough time by a mile to research. Even so, some of his howlers both printed and by word of mouth are cringe worthy, to say the least. He omitted the extremely distinctive rhizomatous *V*. *escondidaensis* [Fig.10], as now universally recognised, from the canon of Patagonian violas. Why? It didn't sound real to him from its description, he admitted to us in private, so until he saw it himself he'd supposed it must have been 'invented'. What? By no less an authority than Becker? In the Kew Bulletin? And not even on April the First!

Fig.10: Ricardo Rossow told us he'd supposed *V. escondidaensis* was a figment of Becker's imagination - until he eventually stumbled on it himself! (28 Nov 2003. ARF)

But worse was to follow. Puzzled by Rossow's failure to even mention *V. escondidaensis*, the authors of *Viola* in the Catalogue of the flora of Argentina (Xifreda & Sanso 1999) came to the conclusion it couldn't be a distinct species, and as the nearest coincidental description they could find happened to be the dwarf shrublet *V. fluehmannii* [Fig.11], they opted for classifying *V. escondidaensis* as a synonym of that.

Hardly less bizarre is the reason given by Ricardo (Rossow 1988) for identifying the white flowered species we later named *V. rossowiana* [Fig.12] (Watson & Flores 2013b) as the completely different yellow *V. coronifera* [Fig.13]. He simply considered that the collector, Harold Comber, must have mistakenly described the flowers as yellow instead of white! Some men are red colour blind, true enough, and colours aren't always easy to define in words, but isn't that straining credibility a bit far?

Fig.11: With no record of *V. escondidaensis* in their literature, Argentinian botanists of the time rashly declared it as a synonym of *V. fluehmannii* here. (5 Dec 2003. ARF)

Fig.12: It's hard to believe Ricardo confused this with the Fig.13 species, but to be fair he'd never seen that one. So Fig.12 ended up as his *V. rossowiana.* (8 Feb 2003, ARF)

Fig.13: The utterly distinctive true *V. coronifera*, as opposed to the white species Ricardo Rossow identified with that name. (17 Dec 1994. JMW)

Fig.14: The one and only true *V. columnaris* of Skottsberg. (30 Nov 2017. H. Jans)

Fig.15: *V. pachysoma* was recognised as distinct from *V. columnaris*, so we and the Sheaders eventually published it together in 2018. (13 Jan 2010. K.J. van Zwienen)

The chronically muddled *V*. *columnaris* [Fig.14] concept involving *V*. *pachysoma* [Fig.15] (syns. *V*. *copahuensis*, *V*. *caviahuensis*), *V*. *petraea* [Fig.20] and *V*. ×*blaxlandiae* [Fig.16] is a quite different kettle of fish. For a number of complicated, difficult and understandable reasons all the last-named three were considered to be the first, *V*. *columnaris*, by Rossow. In fact the mess wasn't completely sorted out until recently (Watson & Flores 2012, Sheader & Sheader 2014, Watson et al. 2018). Furthermore, *V*. ×*blaxlandiae* being a natural hybrid between *V*. *pachysoma* [Fig.15] and *V*. *cotyledon* [Fig.17] muddied the water still more by dragging the latter into the confusion. When any of the very variable *V*. ×*blaxlandiae* individuals mainly inherited the morphology of *V*. *cotyledon* they were identified as that species, unsurprisingly enough ... and some probably still are!

Fig.16*: V. x blaxlandiae* fell into our taxonomic lap for being a hybrid between *V. columnaris* and *V. cotyledon* no one had recognised. (13 Jan 2010. K.J. van Zwienen)

Ricardo's final Flora Patagonica stumble was again entirely excusable given the enforced haste with which he had to investigate and prepare. Admittedly too, the difference involved is so inconspicuous and obscure that it has taken a long while to come to our notice, although we've at last separated *V*. *yrameae* [Fig.18] from *V*. *subandina* [Fig.19] as a distinct species, and we are in the process of publishing it. There's little doubt Ricardo could hardly have failed to discover it either, given more time.

Nobody in Argentina saw fit to disagree with any of these Patagonian predicaments before we came on the scene, and indeed a certain tail-end of confusion may still exist over one, *V*. *petraea* [Fig. 20]. Nevertheless, this requires thorough investigation to confirm.

As is plainly evident, we've every reason to be more than grateful for these oversights though. They've gifted us no fewer than nine new species to date, including the subject of the present saga!

Fig.17: As can be seen here, *V. cotyledon* is clearly one of the parents of *V. x blaxlandiae.* (20 Dec 2002. ARF)

Fig.18: We're about to publish this rare Patagonian as *V. yrameae,* having found it differs critically from its lookalike *V. subandina*. (20 Nov 2010. M. Ferreyra)

Fig.19: Our *V. yrameae* to be, was identified in Flora Patagonica as this very similar *V. subandina*. (13 Nov 2010. JMW)

Fig.20: Distinct (in our opinion) *V. petraea* has been cited as a synonym of both *V. columnaris* and *V. cotyledon*. (30 Dec 2002. ARF)

Fig.21: This shows the underleaf glands (arrowed) of *V. cheeseana* which distinguish it from the similar *V. truncata*. (7 Feb 2008. Universidad de Talca)

Mea culpa.

Just to show no one is immune, and to keep the ball rolling, John 'burnt his own fingers' by initiating a couple of these misdiagnoses, both at the same time and in the same place (Hoffmann et al. 1998, p. 65, nos. 1 & 7). As a feeble excuse, this happened 22 years ago, right at the very beginning of our serious scientific appropriation of section *Andinium*. Still, as it was in an illustrated, best-selling field guide of the Andean flora, it could hardly have been better for propagating the blunders!

The type description of *Viola skottsbergiana* [Fig.21] by Becker (1925) was the only one that seemed to fit the painting of an orangey brown-flowered rossie John was faced with. It had been identified by another author as *V. atropurpurea* [Figs.23, 54], correctly as it happens, but the strange colour couldn't possibly be the metallic blackish blue *V. atropurpurea* that John knew at the time, or so he thought. In fact Becker had provided subtle clues of corolla details which distinguished the two species beyond doubt, but we were far too inexperienced back then to pick them up. Besides, no key existed for this challenging sempervivoid alliance until we attempted one in the IRG recently (Watson & Flores 2020).

By way of consolation, John was in exalted company, however. The type specimen had been wrongly identified as *V. portulacea* by the renowned Carl Skottsberg (1916), for whom the species was named, before Becker came on the scene. Yes, it's that enigmatic and almost unknown *V. portulacea* again.

The start of the *V*. *truncata* [Fig.6] complex muddle by Claudio Gay opened this sorry tale, so it's appropriate that closely related number thirteen by John should round it off.
The viola painted for the book was one of our own collecting, so we knew its geographic origin. It seemed to fit perfectly the description provided for their *V*. *glacialis* by Pöppig and Endlicher (1838). Time would tell that *V*. *glacialis* was actually nothing more than a synonym of that same *V*. *truncata*, and that our plant differed critically from it by the presence of underleaf glands. Only much later did we discover it had been named in an obscure way by Becker (1922), and it was finally given the new name of *V*. *cheeseana* [Fig.21] by John (Watson 2019a).

Fig.22: True *V. skottsbergiana*. John's 'version' in the 1998 guide 'Plantas Altoandinas' was nothing more than a *V. atropurpurea* colour variant. (17 Dec 2013. JMW)

Fig.23: The common and familiar *V. atropurpurea* has been burdened with the 'aliases' of *V. skottsbergiana* and *V. turritella*. (28 Nov 2017. JMW)

Obscure beginnings

After that introductory preamble we move on to lucky fourteenth, the subject of this chronicle.

The existing 22 species of sempervivoids, so little known as a whole, and so similar in foliage, have been subject to more confusion than any other alliance in section *Andinium*. In fact six of our thirteen misdiagnoses above feature them. It's hardly surprising that if the flowers of two species are almost identical superficially as well, then the situation will become even more problematical. The overwhelming likelihood is that the less familiar of them will be identified as the better known. That's exactly what has happened in the case of *V. atropurpurea* and our new species, with the latter universally considered to be the former.

Again, nobody can be singled out and put on the spot for initiating this excusable error. Nor can we say for sure when it began, or where. It has simply been repeated innumerable times in herbaria, in the literature, on the Internet, and by word of mouth since the time the lookalike was first seen (e.g. Hoffmann et al. 1998, Xifreda & Sanso 1999, Rossow et al. 2003, Riedemann et al. 2008, Sheader et al. 2013, Nicola 2017, Nicola et al. 2018). Apropos: *V. turritella*, as we are calling it, was one of the omissions in the *Viola* entry for Patagonia by Rossow (1988), or it would certainly have been identified by him there as *V. atropurpurea*. To know the exact first collection, whether made in Chile or Argentina, would require investigating all material labelled as *Viola atropurpurea* in every relevant herbarium of both countries, if not further afield, which is quite beyond us now for any number of reasons. Still, that's largely irrelevant here. We can, though, sketch in a few more readily available details.

Importantly, *V. turritella* and *V. atropurpurea* occupy separate geographical ranges: in other words they're allopatric, formally speaking. That of *V. turritella* lies to the south and extends down into Patagonia [Fig.53].

Accordingly, it's possible to surmise that the first gathering may have been made by Ada Pastore, who collected it from the Cordillera del Viento in the far north-western corner of Patagonia (Nicola 2017), most probably in the 1940s. She was a highly regarded Argentinian botanist who died young in 1952, aged just 46.

V. turritella was seen by ourselves and photographed for the first time as one or two individuals when with Adriana Hoffmann in the upper Maule sector of Chile just beyond the lake in December 1992 [Fig.24]. Although labelled as *V. atropurpurea* in our field note file, it's at least followed by a precautionary question mark, indicating doubt even then as to whether it was 'the real McCoy': cf. [Fig.23]. Nonetheless, with next to no botanical experience yet of Andean violas under our belts, we considered the new species most likely to be no more than a morphological variation of *Viola atropurpurea*, as generally accepted by the botanical world then.

Our next encounter took place near the beginning of 2003 at the base of Volcán Domuyo in the northern Patagonian Province of Neuquén, Argentina [Fig.25]. This time the population was more numerous and the features which would eventually lead us to differentiate it were clearly evident. Despite very close resemblance to *V. atropurpurea* the flower was larger, the style crest smaller, and the white hair on the petals clearly differed [Figs.26, 27]. More recently Martin Sheader recorded on camera one of a colony on the upper reaches of the long-extinct caldera volcano Cerro Waylie shortly to the south in Neuquén [Fig.28]. A range of the Sheaders' photos of *V. turritella* identified as *V. atropurpurea* may be seen in Sheader et al. (2013, pp. 268-269).

But the Internet provides by far the greatest selection of *V. turritella* portraits to date. And none have exceeded the outputs (as *V. atropurpurea*) of Michail Belov [Fig.29], a major figure in this story, and Kees Jan van Zwienen (2017). Kees (who was sensibly cautious enough to label his as '*V.* aff. *atropurpurea*) expanded the known locations of the species for us, while Michail led us to what was to become its type site.

Enter the vital protagonist

We first encountered Michail, a polyglot Russian expat, casually and momentarily in the herbarium of the Santiago Natural History Museum way back in the early 90s. It was when we discovered his Chileflora website (Belov 2012) in due course that we began to communicate, eventually establishing a firm friendship. At first we contacted him simply to ask for permission to publish certain of his photos in our articles. But the exchange of information grew, and our entente climaxed when the botanical and conservation communities of Chile turned on him for advertising and selling native seeds outside the country's boundary. We, on the contrary, had every confidence in his responsibility and concern for the flora, and gave him our unqualified support.

Cooperation between us blossomed in late 2013 when he took us and our enthusiastic local neighbour Helga Petterson to a new section *Andinium* species he'd discovered. It's waiting to be described and will bear his family's name. The Belovs live in the same Maule Region we were exploring, and we enjoyed their kind hospitality while lodging with them in the course of our two fieldwork periods [Fig.30]. It was during the second, in January 2014, that Michail took us to the fairly substantial colony of the taxon presented here which provided its type specimens. These, incidentally, are a successful fruit of that major viola exploration as largely funded by the SRGC and the AGS.

The route was our familiar, now-asphalted access [Fig.31], which starts near the town of Talca and leads on over the Andes into Argentina via the Pehuenche Pass. It's described in some detail as far as the Laguna del Maule [Fig.32] in IRG 117 (Watson 2019a). We drove on another 7.5 km higher up the road and stopped in the wide valley just short of the pass, still 250 m below the viola's habitat immediately to the east [Fig.33].

Fig.24: The original F.& W.7717 *V. turritella* at Maule in Chile, the first we ever encountered ourselves - 28 years ago! (Dec 1992. JMW)

Fig.25: Our second record of *V. turritella*, eleven years later - this time further south in Argentinian Patagonia, at the base of Volcán Domuyo. (17 Feb 2003. ARF)

Fig.26: Our second population of *V. turritella* clearly displayed how it differed from *V. atropurpurea*, above all in petal bearding. (13 Dec 2010. M. & A.-L. Sheader)

Fig. 27: A flower of *V. atropurpurea* for comparison, showing the dense short indumentum - always present, but never on the lowest petal. (Dec 1987. S. Pern)

Fig.28: *V. turritella* photographed on the ex-volcano Cerro Waylie shortly south of our Domuyo population seven years later. (13 Dec 2010. M. & A.-L. Sheader)

Fig.29: Michail Belov of the Chileflora website who took us to the substantial *V. turritella* type population as well as to another undescribed viola. (17 Dec 2013. JMW)

Fig.30: With Michail's family at Maule. L to R - small son, mother, our neighbour Helga (travelling with us), Michail himself and his former wife. (19 Dec 2013. JMW)

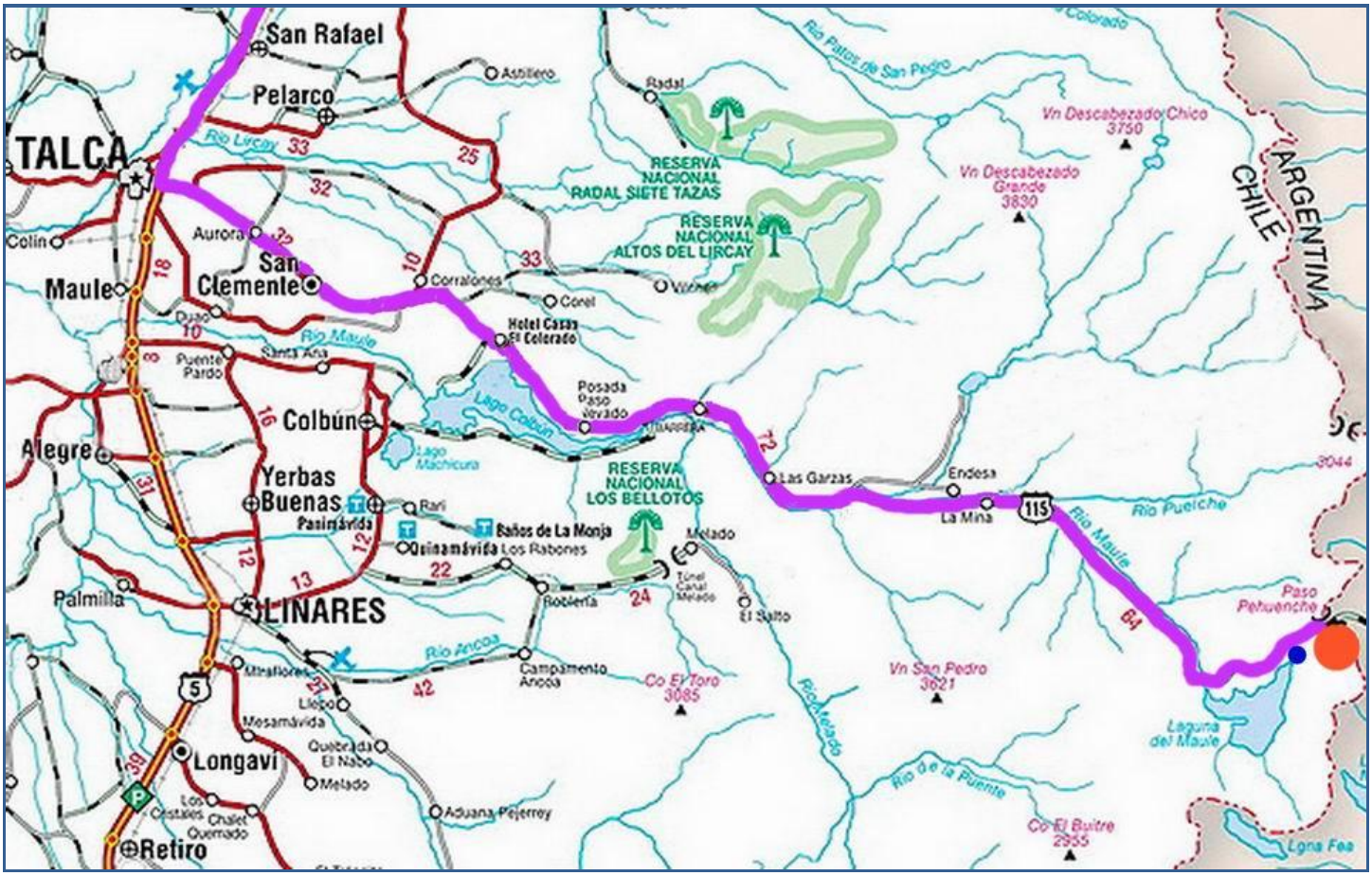

Fig.31: Route to *V. turritella* in Chile along the Maule valley and past the lake of that name. Red circle - type site by border with Argentina. Small blue dot - other colony.

Fig.32: Our beloved Andean Maule Lake, the last landmark before the two *V. turritella* locations. (11 Jan 2014. JMW)

Fig.33: Here we are in the valley near the border with Argentina - right at the base of the slope leading up to *V. turritella*. (9 Jan 2014. JMW)

Fig.34: *Oreopolus glacialis* (Rubiaceae) is a constant Andean floral delight which accompanies us sporadically from central Chile to S Patagonia. (7 Jan 2019. ARF)

Fig.35: *Armeria maritima* at Maule - yes, in Chile, no less. The Latin epithet suggests it may have got here by a long sea voyage! (9 Jan 2014. Helga Petterson)

Getting down to business

The base of the valley itself contains a string of moist green alpine seeps as a result of ground water filtering down from above. They accommodate an attractive flora, and we couldn't resist stopping to look around briefly. Arresting cushions of *Oreopolus glacacialis* [Fig.34] smothered in dainty long-tubed pale lemon stars occupied a few of the better drained pebble-surfaced stretches. It also accompanied us intermittently on our way up to the first *V. turritella* immediately above.

The next subject is certainly not included for its exotic Andean character; in fact it could hardly be farther from it. Readers will be pulled up short to see what looks exactly like homely thrift. Can it possibly be? Well yes: if it looks like thrift, smells like thrift and tastes like thrift, then in this case it actually **is** thrift, *Armeria maritima* [Fig.35], no less! To settle the question of whether it's an escaped introduction, the answer is no; it's an established native. The species has a widely disjunct amphi-hemispherical distribution, but in the temperate zones only, and mainly in the Northern Hemisphere. We may reasonably speculate it was originally vectored to South America by migrating seabirds (Ballard & Sytsma 2000). On account of its morphological variations, this southern community has been considered different from the northern plants, as well as between its own local populations. The 15 synonymous specific epithets it has been endowed with, which include two as *Statice*, plus a further three each of varieties and subspecies, all published between 1787 and 1981, are enough to fill a book! Fortunately, the practical David Moore (1983) shook some good old British common sense into the situation. He wrote in the Flora of Tierra del Fuego, "South American material has been placed in subsp. *andina* ... but there are no clear morphological distinctions from the N Hemisphere populations ..." As a consequence he entered it as *A. maritima* and mercifully it has remained as such in South American and other literature ever since.

The pretty little blue *Perezia* we encountered in this floral community has not proved easy to identify by photos only. However, despite looking superficially more like *P. fonckii* than any others in illustrations available to us (e.g. Sheader et al. 2013, p. 132), the voluminous bracts of the flower head betray it with little doubt as *P. capito* [Fig.36] at the limit of its recorded upper elevation - unless it's a hybrid. We also saw several white forms a bit higher still on the way up to the viola.

Two with delightful tiny tot flowers follow which have already been introduced to readers in the same IRG 117 (Watson 2019a), but we make no apologies for presenting them again, photographed as they grow about 8 km distant and at 300 m more elevation. Both flourished in the rather damper spots. As for one, the absolutely prostrate shrublet of the Rhamnaceae, *Ochetophila nana*, with its galaxies of white *Asperula* lookalike flowers [Figs.37, 38], we've never seen it weaving and winding about among other foliage in such prolific and profuse extensions, and don't expect ever to again!

Now for the other. In IRG 117, John presented a liliputian annual gentian [Fig.39] as *Gentiana prostrata*, a species with a fairly extensive distribution across the Northern Hemisphere between the Alps and U.S.A. The same species name is currently recorded almost universally in the literature of Chile and Argentina for the plant depicted here, its main synonym being given as *G. sedifolia*. However, it has since come to our attention that the identical taxon in Ecuador (Pringle 1999) and Peru (Brako & Zarucchi 1993) **is** identified as *G. sedifolia*, as also recognised internationally (Kew 2020). A now superseded entry by Zuloaga and Morrone (1999) is the only serious recent acceptance of *G. sedifolia* we've been able to find recorded for Chile or Argentina. Pringle is the authority they cite for this judgement. Along with our own selection, as taken in Chile, we've examined a wide range of images from the Northern Hemisphere and South America on the Internet. As a result, important and consistent differences, visual at least for us, may be observed. Furthermore James Pringle is **the** authority on New World Gentianaceae. All this puts *G. sedifolia* firmly in the frame as the correct identity of our Maule species. However, a recent study (Pfanzelt & von Hagen 2015) recognised the taxon found to the south of Bolivia as a distinct species, *G. gayi*.

Nevertheless, they unequivocally support the judgement of the plants from Central America and southwards being distinct from those elsewhere, i.e. the indubitable *G*. *prostrata*. Given this taxonomically volatile situation we prefer to keep our powder dry as things stand! We're sorry to have rambled on at such length over nothing more than a minor walk-on part in this viola drama, but we feel the problem we've uncovered is important and needs to be aired and resolved with consistency by those concerned.

Fig.36: Perhaps *Perezia capito* by the Pehuenche Pass, but so short and neat compared with all photos and drawings it may be a hybrid.
(11 Jan 2014. JMW)

Fig.37: A veritable 'tidal reach' of *Ochetophila nana* flowing out onto the surrounding stony barrens (11 Jan 2014. JMW)

Fig.38: Enough stars to satisfy any astronomer! Close-up of a small section of *Ochetophila nana*.
(11 Jan 2014. JMW)

Fig.39: Apparently not *Gentiana prostrata,* but whether it's *G. sedifolia* or *G. gayi* will have to wait for the experts to fight out. (11 Jan 2014. JMW)

Fig.40: The uncommon *Calandrinia colchguensis*, a candidate for any Andean flora beauty contest. (11 Jan 2014. JMW)

Fig.41: A lovely plant of *Calandrinia affinis* near the Pehuenche Pass, just showing a touch of pink – as opposed to the almost invariable white form. (9 Jan 2014. JMW)

Calandrinia colchaguensis [Fig.40], and also *C. affinis* [Fig.41], by far the more common and dispersed of the two locally and generally, inhabit seeps and damp hollows perforce, as they cannot survive without constant moisture during the growing season. Both of these showy *Lewisia* relatives were first encountered during John's very first visit to South America in 1971 and 1972, *Calandrinia colchaguensis* actually in this same upper Maule sector. During that fieldwork period every population of *C. affinis* we saw bar one individual plant down in the south bore uniformly snow-white corollas. Since then, as here at Maule, we've seen them from time to time with a wide spectrum of pinks, from palest blush to near violety magenta, almost invariably with a white centre.

Going up: top floor - ladies' and gents' viola department

After that short interlude we prepared for the serious task of surmounting the challenge of the long, often steepish, trackless slope to our prime objective. Due to John now being limited in his capacity to climb, and also to pressure of time, it was decided to ascend to the rather inaccessible site by jeep, which at times demanded its full 4WD capacity, to say the least [Fig.42]! Even with the skilful and experienced Michail having taken over the wheel, we sank into the loose surface up to the axles once, and another time came face-to-face with a sizeable boulder, which had to be man-handled out of the way: but we got there. The clearest route possible was chosen, much of the middle and upper part virtually bare ground [Fig.43], to avoid more than a minimum of damage to intervening vegetation.

Fig.42: Keep at it, old gal! Hard going, with plenty of dusty wheel-spin, even for a jeep in 4WD. But she got us there, bless 'er. (9 Jan 2014. JMW)

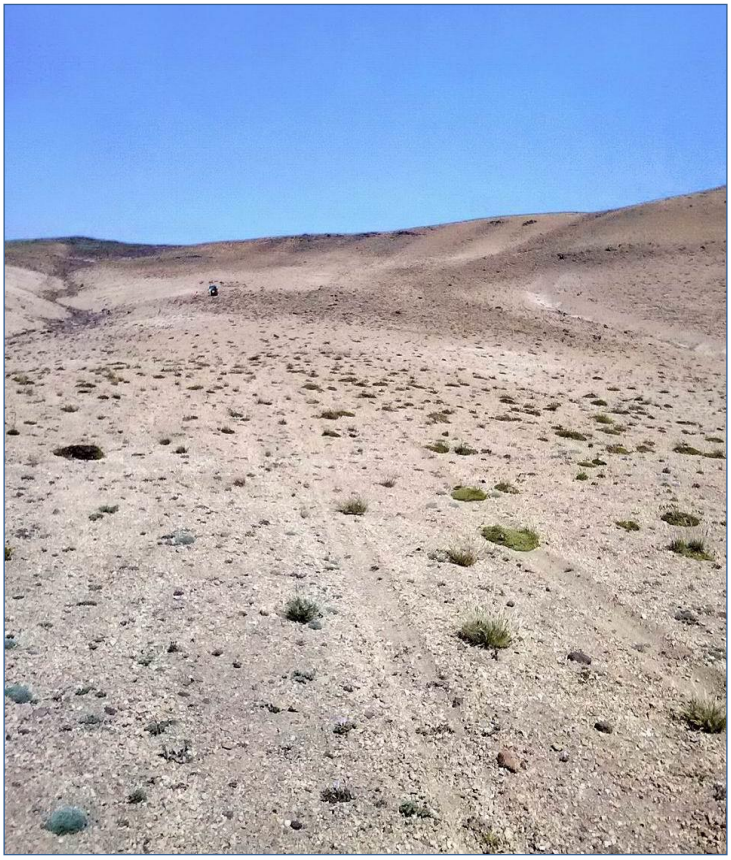

Fig.43: Looking towards the *V. turritella* type site, where our jeep - the tiny spot - has stopped (note the tyre tracks leading up to it). (9 Jan 2014. Helga Petterson)

Both on the way up and when we returned down after achieving our objective, we experienced a series of enforced stops for problems with the vehicle [Fig.51]. On the bright side, these enabled a rough evaluation, collection and photography of the floral community in the general area of what was to become the type site of *V. turritella*.

One species we encountered there which would capture the hearts of alpine gardeners (or rock gardeners, if you will) was undoubtedly *Adesmia glomerula* [Figs.44, 45], despite the tiny yellow pea-flowers which need a magnifying glass to appreciate, and are rather few and far between into the bargain. However, the foliage and form, dense cushions of diminutive, gleaming, silvery pinnate leaves, adequately compensate for that shortcoming. Its undeniably floriferous co-specific on the slope, *A. parvifolia* [Fig.46], extends from end to end of Andean Patagonia and down into Tierra del Fuego. Throughout this entire range it varies to a considerable degree, particularly in flower colour. Several of these forms may be seen depicted in Sheader et al. (2013, pp. 168, 169), who proposed that it probably consists of more than one species, and we wouldn't disagree with that opinion. But at upper Maule we've seen it at a number of widely scattered locations, always with the same uniformly white, violet streaked corollas.

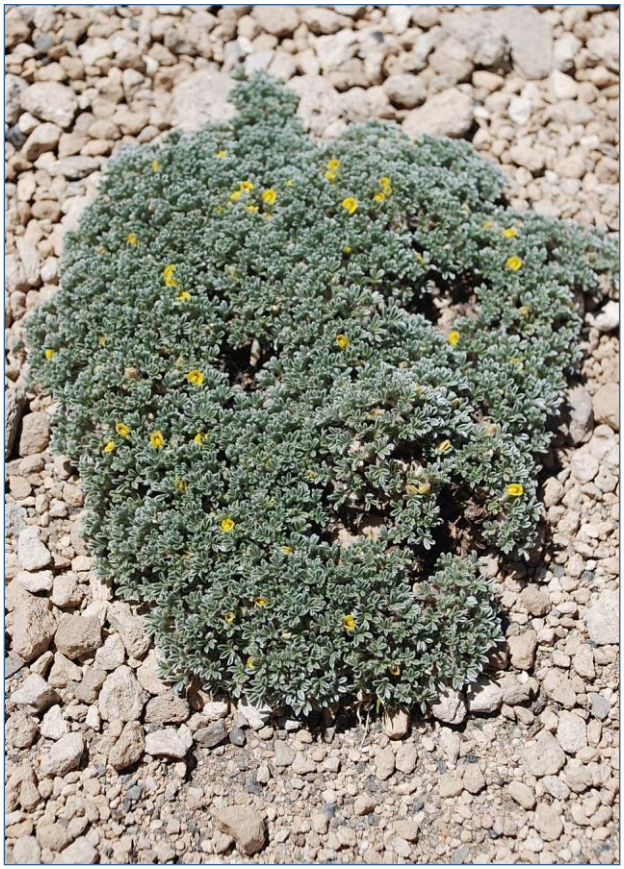

Fig.44: Frequent stops for vehicle fixing and moving rocks allowed photography of local Andean flora. Here *Adesmia glomerula* var. *australior*. (9 Jan 2014. JMW)

Fig.45: A real pity choice *Adesmia glomerata* var. *australior* is so stingy with its bright yellow wee flowers. Prolific flower cover would make it spectacular. (9 Jan 2014. JMW)

Fig.46: The floral display of *Adesmia parvifolia* may be copious, but the corolla colour is too similar to this surround to make an impressive display. (9 Jan 2914. JMW)

Fig.47: *Phacelia secunda* is another whose inflorescences blend chameleon-like into this pale pumice surface. It needs to be appreciated near-to. (9 Jan 2014. JMW)

Phacelia secunda (Boraginaceae, formerly Hydrophyllaceae) [Figs.47, 48], enjoys a much wider distribution still by far: from the southern United States down to Tierra del Fuego, and from sea-level to the high mountains at some 4000 m. Although white here, the flower colour is usually violet. But in particular *P*. *secunda* also exhibits a wide range of growth variation according to elevation and habitat, yet nevertheless is clearly always the same species. Here it was the prostrate, radiating form associated with alpine environments.

Fig.48: The attractive inflorescence of *Phacelia secunda* as seen in close-up. (9 Jan 2014. JMW)

Fig.49: Paso Pehuenches. *Senecio maulinus*, a local endemic as photographed just below the level of *V. turritella*. (9 Jan 2014. JMW)

Mere mention of the word *Senecio* may send a shudder down the spine of those who know enough botany to recognise it as the 'surname' of the cursed groundsel. However, like other sizable genera with fearsome weeds, for example *Convolvulus* and *Erodium*, it also includes among its species (in this case approximately 1250 of them worldwide) several well worthy of garden inclusion, some very choice indeed. Such is *S. maulinus* [Fig.49], at least as found high up here in the region for which it was named.

Several other species were noted but not photographed as we drove by, especially in the lower reaches, but only the superb cushion-forming *Oxalis erythrorhiza*, as well as *Oreopolus glacialis* [Fig.34] and prostrate, dwarf *Pinnasa* (formerly *Loasa*) *nana* grew anywhere near our destination.

Immediately we reached the lower limit of the viola population as was familiar to Michail, he stopped and turned the jeep round. From there on, all went as smoothly as clockwork. Michail and Helga headed on foot for higher up where some other worthwhile species was known. Whatever it was, they drew a blank. Meanwhile, we two stayed near the jeep photographing the many variable viola forms, e.g. [Fig.50], and collecting samples for the press to serve as future type material. It could hardly have been easier, as they grew in small groups scattered about on broad stretches of ground almost lacking any other vegetation. In fact the only other taxa we saw nearby were *Adesmia glomerula* and a few dwarf, wiry Poaceae. Mission accomplished.

Fig.50: And here's our target up at at Maule, *Viola turritella*, just waiting patiently to be described for science. (Universidad de Talca)

Fig.51: Whoops-a-daisy! After being stuck in a ditch on the way up, we've now got a 'flattie' on the way down from the type site. (9 Jan 2014. JMW)

All that remained was to make our way back to the road and 'head for home'. All? About halfway down the slope the jeep started shuddering and yawing. On getting out to investigate we discovered the front left hand tubeless tyre had parted company with its rim and was loosely half on, half off [Fig.51]. Luckily for us this sort off event is a regular hiccup to be taken in one's stride for the mechanically competent Michail [Fig.52], who came to our rescue, as he did on the way up. After that we finished the day's assignment with no further mishaps and to great satisfaction.

Fig.52: That's a mere nothing for Michail, an all-in-the-day's-work event to take in the stride. Here he's stuck on the Vergara Pass a bit to the north.
(28 Feb 2007. M. Belov)

Fig.53: The allopatric distributions of *V. atropurpurea* (pale blue) and *V. turritella* (pink). (Google Earth, modified John Watson)

Fig.54: A typical columnar individual of *V. atropurpurea* from Portillo in central Chile. (28 Nov 2017. JMW)

Fig.55: A comparative form of *V. turritella* at the type site, showing both superficial general similarity and detailed differences.
(9 Jan 2014. JMW)

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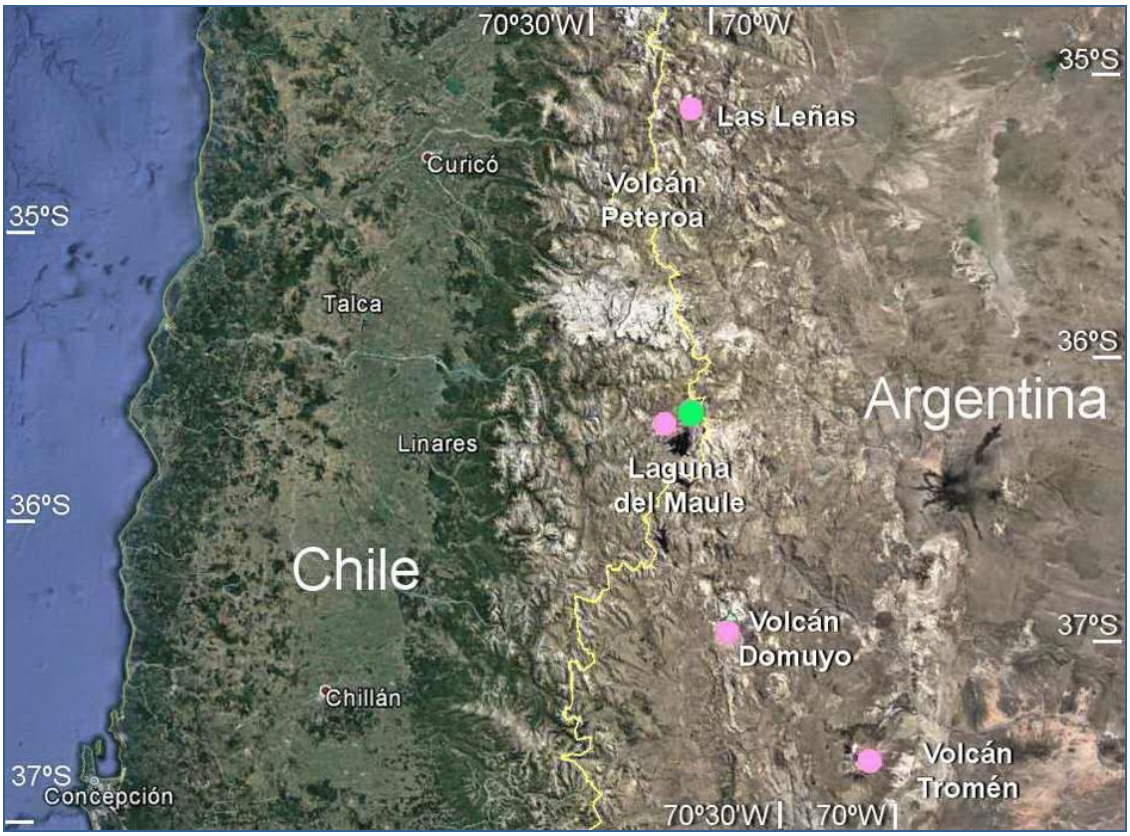

Fig.56: The distribution of *Viola turritella* as indicated by the five populations known to us. Type site - green circle, rest - pink. (Google Earth, modified John Watson)

Fig.57: A most unusual colour form of *V. turritella* at the type locality, the corolla also completely glabrous. (9 Jan 2014. JMW)

Fig.58: By contrast, a fully bearded and common colour form of *V. turritella* at the type site. (9 Jan 2014. JMW)

Fig.59: Another fully bearded *V. turritella* at the type site, but with a distinct corolla shape. (18 Jan 2007. M. Belov)

Fig.60: V*. turritella* at its northernmost location, Laguna Escondida in the Andes of Mendoza Province. (12 Jan 2012. K.J. van Zwienen)

Fig.61: A *V. turritella* with glabrous corollas at Laguna Escondida, Mendoza. (11 Jan 2012. K.J. van Zwienen)

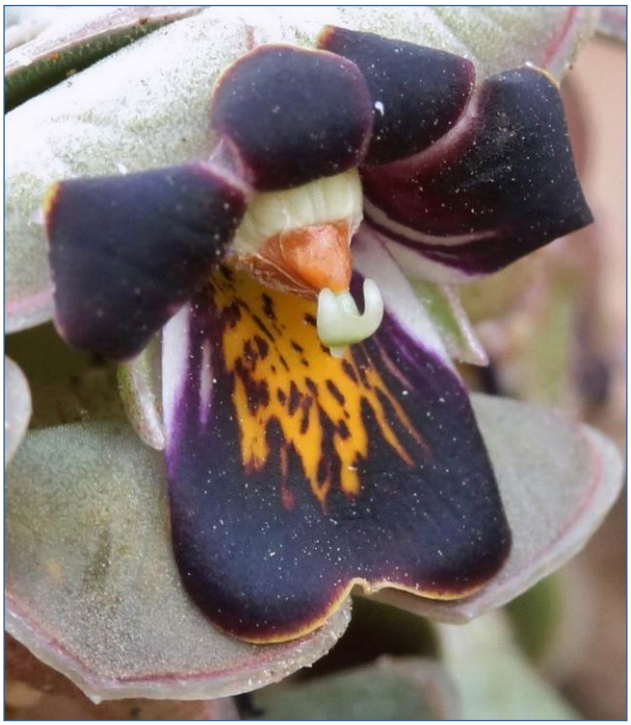

Fig.62: An equivalent individual with an all-glabrous corolla of a typical colour at the type site (9 Jan 2014. ARF)

Fig.63: A close-up of the flowers of the plant portrayed in Fig. 57. (9 Jan 2014. JMW)

Fig.64: An unusual *V. turitella* form recorded at upper Maule. (Universidad de Talca)

Fig.65: Another *V. turritella* at the type site, this the palest coloured flower we know. (18 Jan 2007. M. Belov)

Taxonomy

Viola turritella J.M. Watson & A.R. Flores, sp. nov. [Figs.24-26, 28, 50, 55, 57-65].

Type: CHILE. Maule Region, Talca Province, heights to S of Paso Pehuenches,35º59'45"S 70º23'20"W, 2800-2850 m, 9 January 2014, leg. M. Belov, J.M.Watson & A.R. Flores, F.& W. 12652 (holotype: SGO!; isotypes: CONC!, SI!, herb. Flores & Watson!).
= *Viola atropurpurea* sensu auctt. non Leybold.

Diagnosis: The novelty described here is superficially similar to *Viola atropurpurea* Leyb., for which it has long been mistaken. It differs primarily from that species in its style crest and corolla bearding. In *V. turritella* the former is clearly shorter and more slender, with the two lateral projections of the crest subpatent and directed horizontally or upwards, whereas the much stouter projections of *V. atropurpurea* are horizontal or subpendulous, recurving back into the throat of the corolla. *V. atropurpurea* always has at least the upper longitudinal half of the lateral petals bearded with a dense coverage of very short-stalked, white, clavate hairs, whereas the inferior petal is always glabrous. By contrast, the variable white, clavate indumentum of the *V. turritella* corolla is notably longer stalked, always less densely packed and is frequently present on all five petals. Glabrous corollas are also not uncommon. Other differences are the somewhat larger flowers of the new species, and its more southerly, allopatric distribution.

Description: *Life form* perennial, rosulate, glabrous, evergreen hemicryptophyte. *Rootstock* axial, to ca. 25 cm long × 1 cm dia. at junction with caudex, stout, ligneous above. *Caudex* ca. 3-8 cm, simple or branched, enveloped below living foliage with vestiges of dead vegetation. *Plant* usually as clustered rosettes, commonly few, rarely forming mounds of many, at times also solitary. *Rosette* 1.5-4 cm dia. × 1-6 cm high, densely imbricate to base, frequently columnar, sometimes cryptic, more usually green, slightly depressed towards centre of face. *Leaves* spathulate, ca. 6-15 mm when mature, arranged in distinct spirals, estipulate; *pseudopetioles* 3-12 mm, plane, somewhat fleshy; *lamina* 3-5 × 4-6 mm, entire, suborbicular, usually wider than long, truncate, subcordate, or occasionally somewhat cuneate, minutely apiculate at tip, leathery-succulent, margin 0.3 mm wide, thin-cartilaginous, pale-translucent. *Anthesis* more or less simultaneous. *Flowers* ca. 6.5-10 mm high × 7.5-10 mm wide, axial, solitary, forming continuous or intermittent ring around, and integral with, outer-upper circumference of rosette; *Peduncles* ca. 8-10 mm, somewhat shorter than leaves. *Bracteoles* ca. 2-2.5 mm, basal, linear with acute-subulate apex, hyaline. *Calyx* 6-7.8 mm; *sepals* unequal, superior shorter, ovate-triangular, acute, lower four acuminate. *Corolla* with sparse to fairly dense indumentum of long, clavate white hairs, or entirely glabrous, blackish to deep to mid-violet, occasionally pale whitish yellow, rarely a combination of these; inferior petal with orange-yellow basal marking, streaked and dotted towards base with dark marginal ground colour; all petals of stronger coloured individuals with pale or fine yellow margins; reverse of petals same as ground colour; superior petals 5.8-9.5 × 2-3.1 mm [*4.5 x 2 mm**], linear to linear-obovate, apex rounded to obtusely rounded, partly to entirely bearded, or glabrous; lateral petals 7.5-10.3 × 2.9-4.6 mm [*6 x 2 mm**], obovate, apex rounded to obtusely rounded, more or less bearded longitudinally on superior half, or glabrous; inferior petal 8-11.2 × 7.8-9 mm [*8 x 3.7 mm**], obtriangular, emarginate, subtruncate or rounded, with or without point in apical sinus or at apex, glabrous, or at times more or less bearded along lateral margins. *Spur* 1.5-2 mm, stoutly cylindrical. *Androecium* and *gynoecium*, exserted, readily visible. *Anthers* ca. 1.2-1.5 mm, lower pair with filiform nectar spurs; connectives equal in length to anthers, orange. *Style* geniculate, clavate. *Style crest* short, frontal, with horizontal recurved to upcurved slender lobe-arm either side of style head, these conjoined at base. *Fruit* 3.5-4 mm, orbicular, tri-valved capsule. *Seeds* not seen.
* = comparative measurements of equivalent *V*. *atropurpurea* organs in italics.

Note:—There is no consistent discontinuity of presence or absence of corolla indumentum within or between populations. Two of the four localities, which each contain a significant population, consist of a range from heavily bearded to glabrous individuals. [Figs.58-65].

Field note: The type population of *V*. *turritella* occupies a W sloping habitat of varying but moderate inclinations near the upper limit of the Andean watershed. It is composed of loose, pale volcanic rubble and sand. The actual stretch of terrain where the new species occurs extends for a hundred or more metres vertically, but considerably less so from side to side, and is almost completely devoid of other vegetation. *V*. *turritella* forms small scattered groups, often well dispersed, with most plants growing in complete isolation, effectively as natural monocultures. No overall assessment of numbers could be made, but at most the count is assumed to be little over 100, if not less. Of the local floral community nearby and somewhat below the new species on the same slope, the following taxa were identified: *Adesmia glomerula* var. *australior* [Figs.48, 49], *A*. *parvifolia* [Fig.44], Fabaceae, *Geranium sessilifolium*, Geraniaceae, *Olsynium junceum*, Iridaceae, *Oreopolus glacialis* [Fig.34], Rubiaceae, *Oxalis erythrorhiza*, Oxalidaceae, *Phacelia secunda* var. *secunda* [Figs.46, 47], Boraginaceae, *Pinnasa* (syn. *Loasa*) *nana*, Loasaceae, and *Senecio maulinus* [Fig.45], Asteraceae. There were also species of dwarf, tufted Poaceae. Only *Adesmia parvifolia* was noted in the immediate proximity of the violas, however.

Other material examined: ARGENTINA. Neuquén Province, Chos Malal Department, SW base of Volcán Domuyo, 36º40'41"S 70º31'35"W, 2470 m, 16 February 2002, leg. J.M. & A.R. Watson, F.& W. 10749 (CONC, herb. Watson & Flores!).

Distribution: The novelty described here occurs in Chile and Argentina from 34º58'S to 37º04'S and 70º08'30"W to 70º26'W [Fig.56] as known to the present authors. Four of those six known populations inhabit Argentina, one in the mid-south of Mendoza Province and three in the northern sector of Neuquén Province. The remaining two in Chile consist of a very small colony just beyond the Laguna del Maule, and the main, type population due east of there at the border with Argentina above the Paso Pehuenche (Fig.31). The elevations of these localities range from ca. 2300-3200 m.

General habitats: As known, *V. turritella* inhabits exposed environments of recent but dormant volcanic origin, both on slopes and flats. It occurs on loose pumice in pockets of rock, on shallow scree inclines, and among scattered boulders on and around the base of volcanoes. There is one record from crevices of a sloping outcrop. Open, bare ground is habitually preferred, frequently in isolation as virtual monocultures. Accompanying Andean floral communities, where present, are usually few and scattered. Dwarf species of Amaryllidaceae, Asteraceae, Boraginaceae, Calceolariaceae, Fabaceae, Losaceae, Montiaceae, Oxalidaceae, Poaceae, Rubiaceae and Valerianaceae have been noted in the close vicinity of populations. [Fig.42]

Phenology: Flowering takes place from the beginning of December to mid-February, with capsules maturing between January and the end of March.

Etymology: The epithet *turritella* is Latin for 'little tower'. It describes the most common form of the new species as columnar [Figs.25, 28, 50, 55], and was prompted by use of the same epithet for *Nototriche turritella* A.W. Hill (1909). Although this growth habit is by no means unique in the section, and another species has already been named for it as *Viola columnaris*, we regard it as both appropriate and attractive.

Considered conservation status: Despite forming fairly substantial populations at some of its sites, the new species is by no means common, being known for certain from available data at no more than six distinct locations. In terms of basic criteria (IUCN 2012), the combined known global population certainly stands at well below 2500 mature individuals, and the area of occupancy is far less than 200,000 km^2. Evidence of decline in any of the populations over time is data-deficient, however, and no physical damage has been observed, despite an abundance of goat and sheep herds at three of its sites. It therefore qualifies formally overall as potentially vulnerable, but not immediately threatened (VU). Of individual populations, that near the Laguna del Maule in Chile, if it still exists, is clearly at high risk, with only one or two individuals observed by the roadside over 20 years ago, and a major widening and development scheme having taken place meanwhile.

The taxonomic background

Viola turritella brings to 111 the number of species accepted by us for its section, *Andinium*, as described formally in the literature to date. The best estimate for the species total comprising the genus *Viola* L. (Violaceae) amounts to ca. 610-650 (Wahlert et al. 2014, Watson & Flores 2020). There are 16 sections all told (Wahlert et al. 2014), of which section *Andinium* is the largest, least studied and most poorly understood despite considerable recent efforts. Including known but unpublished taxa it amounts to 146 species (Watson & Flores 2020). It is distributed from the equator to southern Patagonia, mainly along the upper Andes, but also in sectors of the adjacent Pacific coast, and at intermediate elevations.

The novelty described in this work is a member of the substantial and clearly defined sempervivoid infrasectional informal group within section *Andinium* consisting of 23 known species, including the one treated herein. This strictly Andino-Patagonian alliance reaches no further north than San Juan Province, Argentina at 31º30'S, but extends to the southern limit of the section's distribution at

47º49'S in Santa Cruz Province, Argentina (Watson & Flores 2020). Lowest elevations recorded for any of its species are ca. 500 m in southern Patagonia, ca. 1000 m in northern Patagonia, and ca. 1500 m in the central temperate Andes. Most taxa inhabit upper Andean sectors at 2000 m or more (Watson & Flores ined.). The hypothetical background for evolution of the alliance was first proposed by us seven years ago (Watson & Flores 2013a). One other species, *V. nassauvioides*, has been recognised as closely related, but is completely unique and distinct in one respect: it possesses erect individual flowering stems 4-10 cm high with densely imbricated leaves - and will therefore be delegated an infrasectional title of its own (Watson & Flores ined.). It is currently unknown in the wild and was only indicated by its author as being found somewhere in the central cordilleras of Chile together with *V. cotyledon* (Philippi 1892).

The section is notable for the vulnerable rarity of many of its members (Watson & Flores 2015), including these rosulate, sempervivoid violas. Only three species of the latter could by any stretch of the imagination be said to be relatively plentiful and widespread. Most, like the novelty introduced here, inhabit no more than a small handful of fairly adjacent localities, even although their populations may in places be relatively numerous. 5 of the 23 total are recorded from their type site only, none of them currently known in the living state (Watson & Flores ined.).

At least three further members of this particular alliance exist, all Chilean endemics. Two await publication while the third has only been recorded as photographs.

Chronology in the literature

The first of the sempervivoids to be recorded for science was *V. cotyledon* [Fig.17] in 1824 by the Swiss botanist with a flowing name - Frédéric Charles Jean Gingins de la Sarraz, fortunately known to the botanical world as just Gingins! He was a notable pioneer in study of the Violaceae family. Five more of the complex were described in the remaining years of the 19th Century by the four most prominent botanists of the time in the country, Gay, Philippi, Reiche and Leybold, all of them, like *V. cotyledon*, from collections made in Chile They include the latter's familiar *V. atropurpurea* [Figs.23, 27, 54].

Despite the First World War the initial 28 years of the 20th century produced a dramatic increase in the sempervivoid total, amounting to a further eight new species and one subspecies, *V. cotyledon* subsp. *lologensis* which has subsequently been raised to full species rank (Watson & Flores 2011). The first two were described by Skottsberg (1916) from collections he made in Patagonia. The remaining seven, published over a period of four years, were a small part of the prodigious output of violas worldwide Wilhelm Becker of Berlin-Dahlem achieved during his all too short 54 years of life. This qualifies him indisputably as the greatest authority of the genus *Viola* to date. Without doubt, the species of his seven sempervivoids which has most caught public attention is *V. coronifera* [Fig.13]. A photograph of this by Harold Comber fired John's imagination in 1965 and set him on the path to his present committed investigation of the section. Becker only encountered violas in the wild during his early years, close to where he lived in Europe. Probably few if any of his 275 published taxa (IPNI 2020) were seen alive by himself, and certainly none from South America. They were all collected by others. But without doubt that left him with more time to devote to assessing, identifying and describing specimens. In the 72 years of the century which followed a mere two further new species of sect. *Andinium* were added, the last being Rossow's *V. roigii* in 1993.

The two decades to date of the 21st century have seen a renaissance of the section's taxonomy, including the sempervivoid alliance. Seven such novelties have been published so far, one by Martin and Anna-Liise Sheader, the rest by ourselves. And with two more still to be added - watch this space!

Fig. 66: What a lovely day for botanizing. Here we are at the *V. turritella* type site again - just at the time it's in full flower, believe it or not. (7 Jan 2019. JMW)

So it's plant hunting in cloud cuckoo land, eh?

"Oh, Mr Watson, what a wonderful life you lead, it must be one long holiday." Thus spake a sweet old lady many years since, who'd come up to me after I'd delivered an illustrated talk on our most recent plant hunting exploration to an Alpine Garden Society gathering.

John continues: I've been reminded of that rose-tinted view when recalling numerous occasions I would dearly have loved her to be with us. To experience a ferocious Patagonian windstorm whipping up stones into the air which were large enough to fracture our windscreen. To know what it's like to have a loaded pistol pointed at one's head In East Turkey. To watch in helpless horror as Anita was thrown off her horse backwards into a rock-strewn stream. To share the acute altitude sickness we've both suffered on a number of occasions in Chile and Bolivia. To be in an upside-down Land Rover skidding along on its roof. When four of us, again in Turkey, were accused of killing a child. To have lighting thudding into the ground round you a few metres away. To come back down a mountain with leg cramp so excruciating it seems impossible to make base. I could go on ...

But the relevant situation which brings this starry-eyed vision of our occupation to mind now, and in so doing brings the present account to a realistic end, is the most recent visit we made to Maule with daughter Sarah and Anita's Chilean friend Marta at the beginning of January 2019. We actually drove up there to show them *V. cheeseana* by the Maule lakeside, as already described in the IRG (Watson 2019a). The weather at that point was a bit chilly, but sunny with fleecy white clouds - perfectly tolerable in fact. So we decided to continue on as far as the pass over to Argentina, the *V. turritella* type site sector. There we were greeted by storm clouds, hail squalls, much snow on the heights still, and a bitterly cold wind [Figs.66-70]. As they say ... just one long holiday.

Fig.67: Hurry up and take the obligatory family portrait and let's get in, out of the cold. L to R - Anita, John and daughter Sarah. (7 Jan 2019. Marta Molina)

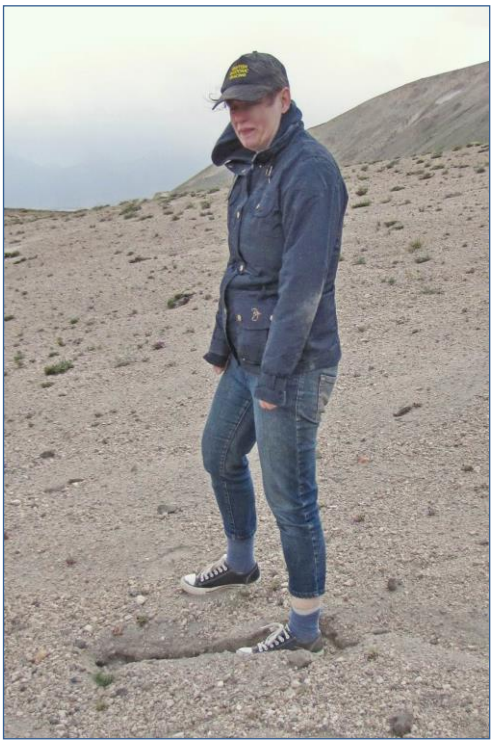

Fig.69: Oooooohh, Dad, it ain't 'arf cold! Sarah with the shivers. (7 Jan 2019. JMW)

Fig.68: Yes, that's real hail alright, and believe us, that window we're looking through most certainly needed to be wound up tight!
(7 Jan 2019. ARF)

Fig.70: We could hardly wait to get back down and out as quickly as possible! (7 Jan 2019. JMW) Note - equivalent of early July in the Northern Hemisphere.

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--- IRG 123 Corrigenda ---

John Watson has reported two errors in IRG 123 March 2020.

In figures 3 and 4 of page 43 the *Argemone* referred to is actually now *Argemone subfusiformis,* not *A. mexicana* as previously recognised and mentioned here.

On page 48 of IRG 123 John stated that there are two species of *Frankenia* in Chile – in fact there are six.

Apologies for these mistakes – thanks to John for his notes.

Argemone subfusiformis G.B.Ownbey, Brittonia 13: 97 (1961).
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---Cultivation---

The cultivation of *Ourisia microphylla, O. polyantha* and their hybrids - Martin Sheader

The intrepid plant hunters, John Watson and Anita Flores, introduced us to a fascinating array of interesting alpines through their annual lists of seed collected in southern Argentina and Chile. We grew many of these, but two of the more colourful and floriferous species that they introduced during the 1990s, *Ourisia microphylla* and *O. polyantha,* grew well for us and became regular exhibits for ouselves and others at AGS shows. We also succeeded in hybridising these two species to produce plants with flowers in an unexpectedly broad range of colours.
Recently the genus *Ourisia,* once a member of the Scrophulariacea, has been transferred to the Plantaginaceae – the Plantain family - along with more familiar genera such as *Antirrhinum, Globularia, Digitalis. Erinus, Hebe* and *Veronica.* There are about 25 *Ourisia* species, native to New Zealand, Tasmania and South America. Species from New Zealand and Tasmania are generally white-flowered, while those from South America are more varied with flowers of white, pink, lavender, violet and red. Molecular studies indicate that the genus first appeared in South America, after the continents had separated, later colonising New Zealand and Tasmania.

***Ourisia* species**

Our first species, *Ourisia microphylla,* is found in the Andes of Argentina and Chile in an area from the southern central cordilleras to the volcano and lake district, growing at altitudes of around 1,500-1,800 metres above sea level. It is a neat shrublet with tight imbricate leaves clasping the rather brittle stems. The insect-pollinated flowers are usually pink, though a few white-flowered populations are known. Both pink and white forms are in cultivation. Growing in cliffs, the roots are fine, penetrating the finest of crevices. We have found this species on basalt and conglomerate cliffs and at one site, under the overhang below a waterfall. Plants generally grow in shade, but may receive full sun for at least part of the day.

Ourisia microphylla growing on a basalt cliff, central Chile

In cultivation we have grown this species in rock crevices in our garden in the south of England, but with limited success. They have survived for a maximum of two years, flowering, but not growing to any great size. However, grown in shallow pans under cover, plants grow quite rapidly over several years to form cushions up to 30cm across. Of course, in nature they are growing on vertical surfaces

whereas in cultivation we grow them quite out of character on the flat, but this is true of many cliff dwelling species grown in the alpine house. The white-flowered form we have in cultivation is more vigorous than the pink-flowered form and the flowers are slightly larger.

Ourisia microphylla pink form in cultivation

Ourisia microphylla white form in cultivation

The second species, *Ourisia polyantha*, is another Andean cliff dweller. It closely resembles *O. microphylla*, but is looser-growing and slightly larger in all its parts. The pendent long-tubed flowers are velvety scarlet to rich orange-red in colour, produce copious nectar and are hummingbird pollinated. It is endemic to Chile, occurring in an area between Santiago and Valdivia, where it grows on damp vertical cliffs. Its distribution does not overlap with that of *O. microphylla.* It was with great excitement that we received Flores and Watson's 1993 collection of seed. From the resulting seedlings we selected a vigorous form with deep scarlet flowers which we named 'Cliftonville Scarlet' which is now the most widespread clone in cultivation.

Ourisia polyantha 'Cliftonville Scarlet'

Flores and Watson also introduced seed of a third cliff-dwelling South American species, *O. serpyllifolia.* We grew this for a few years. The species has trailing stems with relatively few small flowers stems and it was no great loss when we it eventually succumbed.

Ourisia hybrids

By the late 1990s we had successfully managed to cultivate, flower and propagate both these species, and, on a whim, decide to try to hybridise them. We had no great hope of success, since *O. microphylla* is insect pollinated and *O. polyantha* is hummingbird pollinated; as a consequence the structure of their pollen might be expected to differ significantly. We used *O. polyantha* as the seed parent, peeling back the petals of selected flowers to expose their stigmas. Individual anthers were plucked from *O. microphylla* flowers to transfer pollen. Pollinated flowers were marked with a coloured thread. Some seed was set and a few seedlings resulted producing plants all very similar

and intermediate between the two parents. We named the hybrid *O.* x *bitternensis* (named after the suburb of Southampton where we live). We still grow a selection from this first cross (the F1 generation) which we named *O.* x *bitternensis* 'Cliftonville Roset'. This clone remains vigorous with its large deep-pink flowers completely covering the foliage.

First generation hybrid *Ourisia x bitternensis* 'Cliftonville Roset'

We continued cross pollinating the F1 plants eventually producing several generations of seedlings in an array of colours including pink, purple, scarlet, orange and somewhat surprisingly, yellow.

Coral F1

O. polyantha (top left), *O. microphylla* (top centre), *O. microphylla alba* (top right), *O.* x *bitternensis* 'Cliftonville Roset' (bottom)

 Charity registered in Scotland SC000942 ISSN 2053-7557

Parents, first generation and subsequent generations
Top row left to right – *O. microphylla alba, O. microphylla, O. polyantha.*
Second row – first generation *O.* x *bitternensis* 'Cliftonville Roset'
Below these, subsequent generations of *O.* x *bitternensis.*

 Charity registered in Scotland SC000942 ISSN 2053-7557

Under good growing conditions in light shade plants flower well with flowers completely covering the foliage and give a spectacular summer display.

Selected forms of *O.* x *bitternensis* in flower:

Selected forms of *O.* x *bitternensis* in flower:

Selected forms of *O.* x *bitternensis* hybrids in flower:

Ourisia house

We also produced hybrids between both of these *Ourisia* species and *O. serpyllifolia*, together with hybrids incorporating all three species as parents. We assessed these and considered none to be worth retaining. Their growth was quite weak and plants lacked the flower power of *O.* x *bitternensis.*

Cultivation

We cultivate both species and their hybrids in the same way. Plants are grown in shallow terracotta pans standing in individual plastic plant saucers. The compost we use has been modified over the years, but, at the present we use a mix consisting of equal parts of John Innes 2 (any mineral-based loam would do but neutral to acid preferred), sharp grit-sand, sieved leaf mould and fine grit (or sometimes fine volcanic cinder). The pan is top-dressed with grit. When planting, the crown of the plant is set slightly proud of the compost to avoid moisture being retained around the neck. For the first few weeks after potting we water from above until growth is evident and then we water from below. Plants must not be allowed to dry out completely – once wilted they rarely recover. Watering can be reduced in winter, though not to the point where plants begin to wilt. Plants can be potted on at any time when growth is active - from spring through to autumn. We usually wait to repot until growth reaches the edge of the pan and roots can be seen through the drain hole.
Ourisias come into growth in spring with a proliferation of new shoots branching from overwintering aerial growth and from the woody basal stock. In cultivation these extend and branch to form a leafy dome by midsummer when flowers open from their extremities, often completely obscuring the foliage. Removing dead flowers regularly will keep the plants in flower for many weeks. After flowering, if seeds have not set, many shoots die back and often become infected with botrytis. These brittle shoots can be easily removed using a pair of tweezers. Plants in the wild also shed old flowering stems so no need to panic at this stage – the plants are not dying! In late summer a new crop of shoots appear from the centre of the plant and flowering continues sporadically until late

autumn. We continue to remove any dead shoots through autumn and winter, with new growth emerging in spring. We occasionally feed the plants with half strength high potash liquid feed during spring and summer.

Ourisias can be propagated by seed or cuttings. Cuttings are best taken in spring or late summer using new, green, non-flowering shoots. If flower buds are present they should be removed. The cuttings are prepared by removing the lower leaves without damaging the stems. We root cuttings in moist fine Cornish grit, fine pumice or a mix of the two. Using an unheated propagator, cuttings root within a few days or weeks, but in the high humidity conditions fine roots also develop from the leaf axils along the stem. When these cuttings are potted on, the fine axillary roots are prone to fungal infection, usually killing the small plant. So, we root all our ourisias in water, supported in fine Cornish grit and pumice, uncovered in full light the greenhouse.

Ourisia cuttings rooting in water. The central reservoir is topped up daily.

Rooting is rapid and as soon as new growth begins, the rooted cuttings are transferred to our standard compost. Named clones can only be propagated by cuttings.

Seed pod and seeds. Pods are about 2mm long.

Both species and all our hybrids have proved to be self-fertile and are readily pollinated by insects, though the hummingbird-dependent *O. polyantha* benefits from hand pollination. Seeds can be harvested when the seed capsules ripen changing from green to pale brown. Seeds are tiny and once dry can be stored in the refrigerator. For a small seed they are quite long lived and, suitably stored, can remain viable for several years. We usually sow seed in summer and germination is fairly rapid – a few weeks at the most. The tiny seedlings grow slowly and are prone to botrytis so we attempt to use fairly sterile conditions. Seed pots are filled with a mix of fine pumice and sand, and the surface is sterilised with boiling water. When cool, seeds are sown thinly on the surface and the pot place in an unheated propagator or covered with a mini-cloche.

Seed pots under mini cloches

Once germinated, the seedlings grow slowly. After a couple of months or so, when about 1-2cm high, the seedlings are gradually weaned from the high humidity environment of the propagator and pricked out into our standard *Ourisia* compost.

In cultivation, ourisias are subject to a few pests. Aphids may colonise the new growth in spring and can be controlled with any of the usual insecticide sprays. Flowers are sometimes damaged by thrips and this can be controlled by sprays and by removing individual infested flowers. Botrytis is not a major problem, even though all plants will be infected some time during the year; infected stems can be easily removed.

M.S.