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A new viola species, described by John and Anita Watson; enjoying Orchids and winter-flowering species of Gran Canaria by Iep & Gerrit Eijkelenboom; and an overview of Aloiopsis/Nananthus Hybrids in Utah by John Stireman are our main articles this month. Also included is a review of a new book on galanthus, the ever-popular snowdrop. This book is a second edition of Freda Cox' book, reviewed by the successful galanthus and narcissus breeder and grower, Anne Wright.

Cover photo: *Aloiopsis* hot pink hybrid, photo John Stireman.

---Species Description---

The expanding kingdom of an Incredible Shrinking Violet (give or take a mm): a new diminutive-flowered rosulate *Viola* (section *Andinium*) from the Andes of Argentina

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A sneak preview

The room was small and crowded, people were moving around and chatting all the time: it was very distracting. The 'main event' was a home-video showing the two day ascent of the 4114 m Tromen volcano in Neuquén province, northern Argentinian Patagonia [Figs.1, 2], which gives its name to the provincial nature reserve park there (Parque Provincial El Tromen). The protagonists had been the resident park rangers, and the 'theatre' was their office.

It was put on for our benefit, as they'd discovered our interest in the flora as a whole, and violas in particular. Apparently one such had been happened on during their progress to the summit, and was included in the video coverage. It attracted their attention for being the solitary, ultimate species seen at the highest level flowering plants reach there, and which they'd encountered on otherwise barren, rock-strewn slopes of grey ash.



Fig.1: The massive 4114 m Volcan Tromen, after which the park is named. (25 Nov 2009. JMW)

---International Rock Gardener---



Fig.2: A snatched still from the video the park rangers showed us of their two-day ascent of Tromen. (17 Jan 2008. JMW)

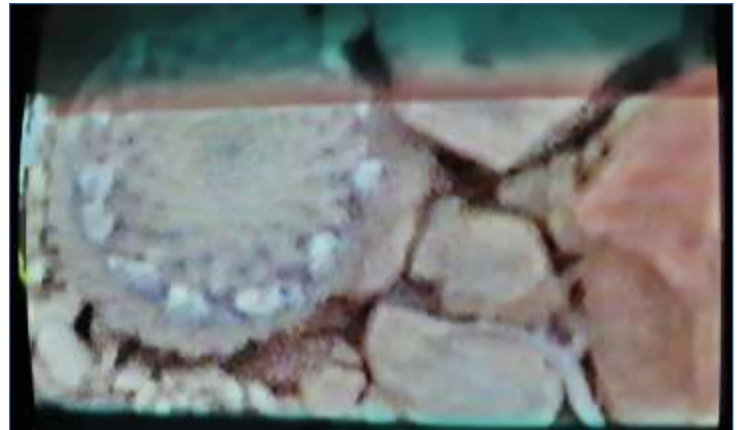


Fig.3: We were given this **very** shaky video sneak preview in 2002. Although it came and went quickly, we identified the species as a form of *Viola sacculus*. (17 Jan 2008. JMW)

Sure enough, on flashed the shaky image, and was gone almost before we could blink [Fig.3], let alone take it in, especially as single-minded concentration was impossible under the circumstances. But we saw just enough to know it was indeed a rosulate viola, and that it had a distinctive ring of conspicuous white flowers on, or around, the top of the rosette. There seemed little doubt to us there and then that it must be a pale form of *Viola sacculus* [Fig.4]. This was a most interesting and significant observation as it would extend the range of that species considerably to the north of its previously known distributional extremity. That they had come upon it after a day's really hard climbing didn't encourage us to follow in their footsteps to take a reference specimen of a species we already knew though, no matter how valuable the record for botanical science!



Fig.4: A pale greenish *Viola sacculus* from Río Negro Province, Patagonia, such as the plant on the video. (Photo - Station Alpine Joseph Fourier)

---International Rock Gardener---

The long interval

That was in 2002. On their way back from southern Patagonia in 1988, Stephen Pern and John stopped briefly for a meal and rest at the little town of Chos Malal, the southern point of access to the Tromen Park. At the time they were blithely unaware of its existence, let alone the remarkable floral and other biodiversity it contained. As we now know, this includes nine or ten violas of the rosulate persuasion, three of four of which are endemic to the park itself.

Our initiation to Tromen in 1994 is owed to Anita's friend, the late Argentinian botanist who wrote the entry of *Viola* in the relevant volume of Flora Patagónica, Ricardo Rossow (1988). Almost unbelievably from our point of view, Ricardo had failed to include the utterly unique, rhizomatous *Viola escondidaensis* [Fig.5] in that work. With John's long-standing interest in these Andean violas as background, it was clearly one of the most outstanding and unmistakable Patagonian species. He'd actually seen the type specimen at Kew, and we longed to see it in situ. Ricardo confessed to us rather shame-facedly that it had seemed so improbable he'd convinced himself it was 'a hoax invention' and didn't actually exist in real life, which was why he hadn't even mentioned it. He admitted this was not exactly what could be described as 'professional scientific procedure', but excused himself on the basis that he'd been recruited at the very last moment, having known nothing about the genus *Viola* in South America or anywhere else beforehand. But in 1993 he'd been rudely but pleasantly shocked into realization of his error by actually finding *V. escondidaensis* ... in the Tromen park, no less. So he kindly gave us a general indication of its whereabouts there, and also a spare herbarium specimen. It was at this time we discovered to our considerable surprise his intention to parallel our investigation of these particular South American violas. Whether that would have continued as cooperation or amicable rivalry we shall never know because, sadly, he died in 1995.



Fig. 5: Our initial reason for scouring the Tromen nature park. F.& W.10632 *Viola escondidaensis*, as reported by Ricardo Rossow, and located after several searches. (24 Dec 2002. ARF)



Fig. 6: In 1994 we discovered our first new viola in the park, the recently published F.& W.11608 *Viola rubromarginata*. (21 Jan 2008. ARF)

We therefore took our first cursory look around in 1994, concentrating on the area we thought had been indicated by Ricardo, but drawing a complete blank there, to our considerable frustration. Appropriately, the Spanish word '*escondida*' means hidden! That was by no means the end of the story though, as we happened to camp at exactly the spot which was to become the type site of *Viola rubromarginata* [Fig.6] (Watson & Flores 2018b). Anita found it during a pre-prandial look-around, and we knew there and then it was new to science. Some compensation!

Apart from a couple more vain searches for elusive *Viola escondidaensis*, which we knew lived somewhere among the endless vistas of pale bunch grass, other geographical destinations and projects mainly occupied us for the next eight years. But in 2002 we returned for the fourth time and hit the jackpot. Right at the open gateway entrance to the park the bunchgrass stretched unpromisingly around and above us, but our thorough search first revealed a showy colony of the stout greenish yellow amaryllid **Myostemma* (syn. *Rhodophiala*) *mendocinensis* [Fig.7], with its tight umbels of upright, colchicum-like flowers, growing on a bare upper stretch. Mixed unobtrusively with it was another of the park's violas, the cryptic little annual rosulate *Viola tectiflora* [Fig.8], new for us, if interesting rather than exciting. Returning down to the jeep we then at last noticed our first *V. escondidaensis* [Fig.5] beside the dirt roadway, tucked away at the base of one of the grasses, and as we 'got our eye in', more and more became apparent.

[Taxonomic note: **Myostemma mendocinensis* (Phil.) J.M. Watson, comb. nov.
Basionym: *Habranthus mendocinus* Phil., Anales Univ. Chile 21: 406. 1862.
Synonym: *Rhodophiala mendocina* (Phil.) Ravenna, Pl. Life (Stanford) 26(1): 87. 1970]



Fig.7: Chunky *Myostemma mendocinensis* (daffodil family) near the entrance, one of the first species we saw in the Tromen Provincial Park. (24 Nov 2009. ARF)

During widespread combing of extensive areas of the park for this elusive quarry we came to appreciate its remarkable biodiversity and potential for yielding new species, which encouraged us to explore its every corner over a series of eight visits between 1997 and 2009. These were constantly stimulated and reinforced by actual encounters with undescribed plants of various genera, but above all these particular violas. In fact, to run off a set of boring statistics we've clocked up a total of eleven new species of them in northern Patagonia and immediately adjacent Chile (including the one featured here). Six are found within the boundaries of the wider park, three of them endemics there. So far we've managed to publish seven of the eleven: *VV. x blaxlandiae* (Watson & Flores 2012b), *rossowiana* (Watson & Flores 2013b), *farkasiana* (Watson & Flores 2018a), *rubromarginata* [Fig.6] and *trochlearis* (Watson & Flores 2018b), *pachysoma* (Sheader & Watson 2018), and *anitae* (Watson 2018). This publication will see the eighth.



Fig. 8: Annual, camouflaged, tiny-flowered F.& W.11884 *Viola tectiflora* was one of the first of its genus we registered in the park. (27 Nov 2009. JMW)

Fig.9: F.& W.10648 *Montiopsis* (syn *Calandrinia*) *cistiflora*, a somewhat variable species spread across the park's lower elevations. (26 Dec 2002. ARF)

The immediate surrounds of Volcán Tromen were particularly rich, and we logged many species there. Among the more immediately noticeable were *Montiopsis* (syn. *Calandrinia*) *cistiflora* [Fig.9], and the fuzzy white heads of prostrate *Gamocarpha selliana* [Fig.10] with their basal ruff of spines, scattered over the ground like so many golf balls. This member of the generally unfamiliar Calyceraceae was previously unknown to us. The small family is endemic to South America below the equator, being predominantly temperate, and lies somewhere between the Dipsaceae (scabious and teasel family) and Asteraceae on the evolutionary scale. It was quite surprising to find stinging *Loasa tricolor* [Fig.11] so far south here - a species we associate more with the zone around our home environments in central Chile. The small, elegantly spidery white bulb *Tristagma nahuelhuapinum* [Fig.12] was another new entry for our personal list



---International Rock Gardener---

too, although the most surprising aspect of ubiquitous, showy *Calandrinia affinis* [Fig.13], a widespread inhabitant of damp places throughout the central and southerly temperate Andes, was its strong magenta petal-tip coloration and dark centre, the latter possibly due to a fungus which infects the pollen (Elvebakk et al. 2015), sometimes after it has shed. Nor had the genus *Tristagma* finished with us, for we also encountered *T. atreucoense* [Fig.14], not only identified from Martin Sheader *et al.*'s 'Flowers of the Patagonian Mountains (2013), but noted therein as only recently recorded from the park.



Fig.10: F.& W.11596 *Gamocarpa selliana*, a very occasional sighting among the steppe flora on the level base between the park's mountains. (12 Jan 2008. JMW)



Left: Fig.11: Neuquén is the southernmost limit of (F.& W.11597) *Loasa tricolor*, a frequent wayside weed, redeemed by fascinating flowers - which sting, as does every part of the plant! (14 Jan 2008. JMW)



Right: Fig.12: At the foot of Volcan Tromen, the elegant dwarf bulb, F.& W. 11878 *Tristagma ameghinoi*. (27 Nov 2009. JMW)

---International Rock Gardener---

But it was as a result of discussing with a park ranger in 2002 about our search and original discovery of *V. escondidaensis* that we got to know them and were invited to attend that 'private showing' of the climb up Volcán Tromen, and we only appreciated seven years later just how ironical the situation had been.

Fig.13: Anyone who has visited the temperate Andes will probably have seen snow white *Calandrinia affinis* en masse. Colour forms such as this are uncommon. (22 Dec 2002. ARF)



Fig.14: *Tristagma atreucoense*, the second of its genus seen around the foot of Volcán Tromen. (22 Dec 2002. ARF)

Now the foot of the volcano cradles a small lake [Fig.1], sometimes adorned by stately wading flamingos, and beyond that on the opposite side to the north is a lower and more accessible peak called Cerro Wayle (pronounced 'why-lee'), apparently a volcanic caldera. This is indicated by its indigenous Mapuche name 'huaille', which means hollow-centred. It is in fact an ancient, open-ended crater, so more slantingly 'U' shaped than a typical circular 'O'.

A vehicle track cut out of the volcanic ash leads up towards the flattish summit via the western slope of the mountain at the bottom of the curve of the 'U'. During one of our earliest visits to the park we were unwise enough to give it a try. Well underway a large rock had recently dislodged and partly blocked the route ahead. There was, nevertheless, just enough room to drive gingerly around it, if quite close to the precipitous outer edge. Enough room that is until the ash slid away

---International Rock Gardener---

and left us with the front outer wheel on the driver's side in the air and suspended perilously over the steep slope! The first precaution was for John to somehow manoeuvre himself from out of the driver's seat to terra firma before Anita left the passenger side, so his weight didn't tip the vehicle over. The rest was easy. After jacking the jeep up sufficiently, we spent most of the afternoon laboriously constructing an extension of the track beneath and behind the unsupported wheel from rocks as solid and heavy as we could manage, shovelling in ash to fill the gaps and make the final level surface. Nothing more was needed than to back carefully onto the original track and keep on backing and backing until there was space to turn around and get the hell out of there. We've never tried that route since.



Fig.15: Cerro Wayle. The northern ridge we explored, starting from its lowest point on the RH. It dips to the left before rising again to the mountain's 3296 m high point. (25 Nov 2009. JMW)

On the opposite side of the mountain to our dramatic event, a small, basic ski centre, uninhabited after the winter season, nestles at the base within the east-facing 'U', and an inviting ridge [Fig.15] leads up from the right-hand side to the high point, the apex of the 'U' at 3296 m. We first ventured along it during our prolonged exploratory visit to the park in December 2002, discovering a variety of more compact herbs as well as cushion-forming species up there as we went, in contrast to the generally rather taller and more open plants on the flat steppe below. We were particularly gratified on first reaching the top at the beginning of the climb along the ridge to find *Sisyrinchium laetum* [Fig.16] full of flowers. Something, goats without doubt, had chewed down a number of the leaves earlier, but unlike almost everywhere else we knew it, the fertile shoots had escaped their malignant attention. So at last we had worthy photo portraits of the taxon we'd upgraded from subspecies to species (Watson & Flores 2010). One of those choice Wayle denizens, *Pantacantha ameghinoi* [Figs.17, 18], had only been seen once previously by either of us - by John with Stephen Pern in 1988 at Las Leñas further north. With its upright, stemless creamy bells it might deceive the casual observer into suspecting it to

---International Rock Gardener---

be an unusual spiny dwarf member of the Ericaceae - whereas in fact it belongs in the Solanaceae and is not too far removed from the more familiar benthamiellas. By contrast, *Polygala salasiana* [Fig.19] and *Oxalis erythrorhiza* [Fig.20], of no less potential appeal to the alpine gardening fraternity, were quite regular sightings for us.



Fig.16:
Sisyrrinchium laetum flowering on Cerro Wayle as never before seen. Raised to species by us from its unsupportable rank as a subsp. of *S. macrocarpum*. (24 Dec 2002. ARF)



Fig.17, above left: The plants of F.& W.10634 *Pantacantha ameghinoi* on Wayle were much more prostrate, compact and neat than those seen by John in 1988 at Las Leñas. (24 Dec 2002. ARF)

Fig. 18, above right: F.& W.10634 *Pantagacantha ameghinoi* in close-up, showing the rather ericaceous-looking flowers. (24 Dec 2002. ARF)

---International Rock Gardener---



Fig.19: Quietly attractive little *Polygala salasiana* on the Wayle ridge. (24 Dec 2002. ARF)



Fig.20: *Oxalis erythrorhiza*, a frequent and ever-welcome sighting during our times in Patagonia. (24 Dec 2002. ARF)

Just as the array of interesting plants began to peter out shortly below persistent patches of snow higher up [Figs.15, 24] - and we decided to turn back down to the jeep, we noticed a columnar rosulate viola, apparently past flowering [Fig.21]. Superficial on-the-spot examination showed it to be in seed, with some capsules already voided and no evident sign of flowers. It had the classic form of the *Viola atropurpurea* [Fig.22] alliance. In fact, less than two months later we discovered a lookalike on nearby Volcán Domuyo we believed fitted the bill, one that we've since found several times in the same general geographical area. First misidentified by ourselves as *Viola skottsbergiana*, and now provisionally labelled as 'aff. *atropurpurea*', it has dark corollas and a wide and variable flowering period. Martin Sheader subsequently told us that he has actually found it on Cerro Wayle - apparently on the other side where we and our jeep almost came to grief! See also Sheader *et al.* (2013: pp. 268/69). Six years and another three visits to the park followed before any further relevant development took place.

---International Rock Gardener---



Fig.21: F.& W.10635, the Wayle viola as first noticed and collected post-flowering in 2002. (24 Dec 2002. ARF)



Fig.22: For comparison with the Wayle plant. F.& W. 13092 *Viola atropurpurea* in Chile at Portillo, Aconcagua Region, the high pass to Argentina. (28 Nov 2017. JMW)

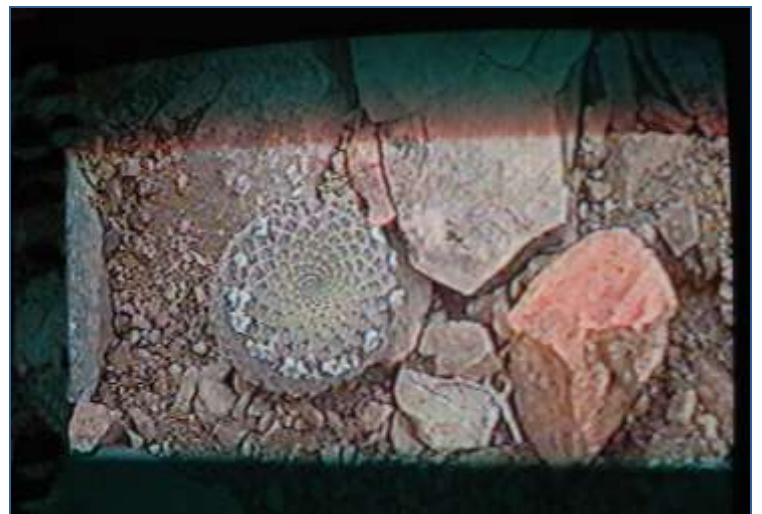


Fig.23: Five years after we'd first seen the video of the Tromen viola, we were given a 'private showing', took photos of the screen, and realised it was excitingly new. (17 Jan 2008. JMW)

---International Rock Gardener---

The main feature

From 2002 to 2008 Chos Malal and the Parque Provincial El Tromen became something of a home from home for us. Early on we'd found it convenient to stay at the small, intimate guest house-like hotel of Carlos Zimmermann and his wife Vilma. They became good friends, and Carlos would send us e-mail images of his adventurous sorties with friends into the Argentinian Andes. He was also free with his ascerbic opinion of the corrupt Kirschner governments, climaxing with an acrimonious desire for the dethroning of 'la señora K', the widow of Nestor Kirschner, which was eventually granted! We once saved Carlos from being swindled by one of those Internet frauds which (apparently) offer a share in some fortune on revelation of one's bank details, and he was eternally grateful for that. Sadly he died a few years ago, but we still occasionally communicate with Vilma.

In January 2008 we also renewed our contact with the park rangers, and managed to arrange a second viewing of that video showing the ascent of Volcán Tromen, this time alone in the house of one of the rangers with his hospitable wife and no distractions. We were fully prepared for when the viola appeared again, and not only took it in attentively, but John also photographed the screen [Figs.2, 3, 23]. It was now immediately apparent that this Tromen plant was nothing to do directly with *Viola sacculus* [Fig.4]. Careful digital editing back home showed it to have dense, imbricated, multiple spirals of leaves on the face of the rosette, and the many white flowers forming a ring around the circumference looked remarkably small into the bargain. Obviously this called for an urgent investigation and collection of a reference specimen. But how? We were faced by a dilemma. A reasonably fit 71 year-old John might have been - fit enough indeed to climb a steep scarp and find the new *Viola anitae* (Watson 2018) the following year. But an all-out two-day sortie on a major volcano was nevertheless beyond our then physical scope. The only realistic possibility was to hope we might persuade the rangers of the importance of their discovery and the need to return and bring down 'the goods'. But we had to leave before there was a chance to broach the subject.

Fortunately, the problem was solved surprisingly by ourselves, no less, at the beginning of the following season. This time we returned earlier, in November, with a view to catching our Wayle viola in flower and assuring ourselves of its identity. With Carlos away on one of his periodic fishing jaunts, Vilma happily accepted to accompany us [Figs.24, 27]. The early part of the climb was an auspicious start. We managed to photograph a most uncommon species of the many South American lizards in the genus *Liolaemus*, *L. punmahuida* [Fig.25], an endemic of a few mountains in the park. Another important first for us was the scarcely less rare *Benthamiella graminifolia* [Fig.26]. After taking time and care to capture these as digital records, John noticed Anita and Vilma seated nearby on the ridge with smug, triumphant smiles on their faces [Fig.27]. What they'd discovered a short way further on washed everything else from everyone's mind: a tiny rosulate viola with the smallest white flowers imaginable, making an ordinary pencil Anita had placed beside it for scale look almost monstrous [Fig.28]!!! It was not only immediately evident as utterly new to science, but also as that same enigmatic species we'd been seeing on those videos from Volcán Tromen. Thus we had the type specimen collected then and there from the small population on Wayle (but see note under Taxonomy below), plus a second definite location for this novelty on Tromen.

But it didn't even end there. The rangers had informed us of the existence of another viola they'd seen on the high point of Cerro Negro, still within the extensive park, but about 20 km further west. This one had also been out of flower. We decided to give it a go, and drove to the spot two days later in the jeep along a convenient asphalt road with a nearest drop point at 1660 m between Chapua and Tricoa Malal, leaving a considerable winding, cross-country walk to reach the mountain. We set off on the foot-slog at about 10.30 in the morning, and by 1.30 mid-day, having seen nothing of much interest, only reached a small stony and rocky 2100 m platform [Figs.29, 30]. It represented the very start of an extensive whaleback ridge 2.35 km long, which rose gradually eastwards to form the peak of the mountain at 2499 m. But despite a bitter wind that chilled us to the marrow - even although clothed in

---International Rock Gardener---

anoraks and wind cheaters, the platform alone proved to be a glorious culmination of our day's effort. For on it we noticed one or two scattered viola rosettes, and a thorough examination yielded one plant with a single flower - that of our same new species from Wayle and Tromen. Solitary that bloom may have been: but evidence enough beyond question it most certainly is.



Fig.24: While John fiddles about photographing anything and everything, Anita and Vilma forge ahead up the Wayle ridge. (25 Nov 2009. JMW)



Fig.25: A handsome and obliging local lizard, an Andean Liolaemus species, the extremely rare *Liolaemus punmahuida*, a Tromén endemic. (25 Nov 2009. JMW)



Fig.26: Quite rare - and new for us - F.& W.11876 *Benthamiella graminifolia* was added to our list of 'Wayle specials', seven years after our original visit. (25 Nov 2009. JMW)

---International Rock Gardener---



Fig.27: Anita (R) and Vilma (L) sitting triumphantly back down on the Wayle ridge after having encountered the mystery rosulate viola in flower. (25 Nov 2009. JMW)



Fig.28: And here it is. F.& W.11875 *Viola abbreviata* pencilled in and sized-up (or down!) when first seen in flower at the Cerro Wayle type site. (25 Nov 2009. ARF)

---International Rock Gardener---



Fig.29: Brrrrr - high summer maybe, but a polar blast hits John face-on at the Cerro Negro location of *Viola abbreviata*! (27 Nov 2009. ARF)



Fig.30: Anita, also togged out to the nines in the cold, mid-day sunshine. This, our own second site, had just 4 individuals with one flower between them. (27 Nov 2009. JMW)

---International Rock Gardener---

There seemed to us little doubt that the reported viola population way up ahead on the summit must also be nothing more than the same species. So Anita prudently decided to turn back there and then in order to repeat the long morning's walk in reverse while she still had the energy left. John, on the other hand, decided after a lunch break to give the main objective his best shot, and kept going. Picking a path along the rocky, heavily vegetated and at times precipitous side of the ridge while attempting to make height at the same time was no mean task. An hour or more passed and the top seemed as far away as ever, even though it wasn't. Leg muscles began to feel the strain. The raw wind continued, unabated. A twinge of cramp served as an early warning. Give up, it's no disgrace! The return to the jeep would anyway now be more oblique and longer. He took the hint and zig-zagged down the sloping mountainside. Another cramp struck, this time more violently, seizing up a leg rigidly with acute pain. The distance was interminable, the progress ever slower in a vain attempt to limit the cramp. But that physical torture increased, both in frequency and excruciating strength. Was it worse than he'd suffered three and a half years earlier on a stiff, long climb to collect a new caladrintia specimen near Santiago? Impossible to say; call it a tie! At last the asphalt road came into distant view, with an occasional passing vehicle. It might have been a light year away. John felt he could never reach the jeep. Somehow he finally staggered onto the road, but the last few hundred suffering metres along its level surface were the most unbearable of all. Surely there can be few worse instantaneous, searing pains than cramp. Never could he have been more glad at long last to see the bright sunny yellow shrubbery of *Senna arnottiana* [Figs.31, 32], the only flowery place brightening that landscape, indicating where the jeep was parked. A merciful late afternoon relief at last to end John's protracted agony!



Fig.31: F.& W.11886 *Senna arnottiana*, marking end of John's agony and a fitting floral farewell to our last visit to Chos Malal and Tromen. (27 Nov 2009. JMW)

---International Rock Gardener---



Fig.32: F.& W.11886 *Senna arnottiana* in close-up. (27 Nov 2009. JMW)



Fig.33: General habitat of *Viola abbreviata* as found by the AGS tour group en route to the Paso de las Damas, Malargüe Dept. Mendoza Prov., central Argentina. (13 Dec 2018. David Haselgrove)

---International Rock Gardener---

Franchise sequel 1

In late 2018, from November 28th to December 19th, an Alpine Garden Society tour group visited the temperate Andes, beginning their trip at Zapala in Neuquén province, Argentina, and finishing up where we live, at Los Andes, central Chile. It had been planned by the highly experienced Martin Sheader, who was also intended to be the leader, but unfortunately had to withdraw at the last minute for personal reasons. Nevertheless, the original itinerary remained unchanged, and the tour was led instead by one of its members with considerable personal knowledge of the sector as a result of a number of previous visits, David Haselgrove. Susana Montesinos had charge of the practical organization of the tour, and her botanist brother, Daniel, identified the plants. One of the main objectives was to see as many *Viola* species as possible, this being their main geographical centre of distribution (Watson & Flores ined.), and as such it succeeded more than handsomely.

During the course of their journey we Watsons were regularly sent images by e-mail to confirm or provide identities for a number of the rosulate violas they were finding underway. One from Malargüe Department in Mendoza Province completely astonished us. It happened to be none other than the same little species from Wayle, Tromen and Cerro Negro we were already preparing to publish here ... but 300 km further to the north!

We immediately informed those concerned of this remarkable coincidence. We'd previously been kindly invited to join them over a meal during their final stay at Los Andes. As well as meeting up with old friends and making new ones, we naturally broached the topic of the Malargüe viola they'd encountered. There was no objection whatever to it being published and illustrated here, in the protologue. On the contrary, everyone was delighted at the prospect.



Fig.34: The track in Marlargüe, Mendoza, beside which the Alpine Garden Society tour found *Viola abbreviata*. (13 Dec. 2018. David Haselgrove)



Fig.35: *Viola abbreviata*, as found in Mendoza near the border with Chile (well to the north of the type site) by the Alpine Garden Society tour group. (13 Dec 2018. David Haselgrove)

The group in their two vehicles had been trying to reach the high Paso de las Damas right on the border with Chile, but were stymied short of the mark by a river in spate that they were unable to cross. Shortly after turning back, a few of them in the smaller of their vehicles decided on trying a side track heading gently up the floor of the valley [Fig.33] through large tracts of dominant, open bunchgrass [Fig.34]. Stopping for a look around, they noticed they'd only just avoided by chance running over and squashing the first of these relatively few violas to catch their attention, right by the trackside [Figs.35, 53-55]!

A wider cast around revealed further interesting Andean steppe dwellers, especially on more open, grass-free tracts. Dominant among those were the hard cushions of *Azorella monantha*, dusted with multitudes of its tiny yellow flowers [Fig.36]. Some of the larger individuals [Fig.37] may well be very ancient indeed, possibly even dating back a thousand years or more, like their famous congener high up near the border with Bolivia and Peru, *A. compacta*.

Two species with unique character particularly drew in the photographers. Like the rest of its fellows down here in the south, *Jaborosa laciniata* [Fig.38] forms a more or less untidy prostrate rosette of divided, jagged leaves. But that's as far as the comparison goes. The flowers are something else. Shiny, jet-black, stemless goblets, as though carved out of Andean obsidian, with a white, undulating rim and a small, discreet central cluster of paler anthers and stigma.

Bold *Calycera herbacea* [Fig.39], on the other hand, sports a far more orderly, circular prostrate rosette, from which springs a stout central stem surrounded by shorter, radiating secondary stalks, each bearing a solitary spherical head of tightly packed tiny green flowers. The texture of these reminds us that the Andean broccolis and cauliflowers belong to the same family, Calyceraceae (as described above, further back). When the flowers turn to fruits they lose their harmless appearance and sprout wicked long, spiky spines.



Fig.36: Dwarf Andean steppe flora near the site of *Viola abbreviata* as discovered by the AGS group in Malargüe, Mendoza, central Andean Argentina. (13 Dec 2018. David Haselgrove)

---International Rock Gardener---



Fig.37: Common *Azorella monantha* is the predominant Andean steppe denizen on open stony flats near the AGS tour's Malargüe *Viola abbreviata* habitat. (13 Dec 2018. David Haselgrove)



Fig.38: Strange, inky black *Jaborosa laciniata* a prostrate species seen by the AGS group near *Viola abbreviata* below the Paso de las Damas. (13 Dec 2018. David Haselgrove)



Fig.39: Another vegetable oddity with character seen in the vicinity of the AGS group's Malargüe site, *Calycera herbacea*. (13 Dec 2018. David Haselgrove)

---International Rock Gardener---

Fig.40: The indication at the top of the concrete steps leading down to the mercifully cool underground Ruiz Leal herbarium (MERL) at Mendoza. (23 Jan 2019. JMW)



Fig.41 below left: The cool subterranean herbarium at MERL where Cecilia draws her illustrations and we encountered collections of *V. abbreviata* from two further locations. (23 Jan 2019. JMW)



Fig.42 above right: Maria Cecilia Scoones patiently working on a botanical drawing in the pleasant atmosphere of the herbarium (MERL) in Mendoza. (23 Jan 2019. JMW)

Franchise sequels 2 & 3

While in Argentina at the herbarium (MERL) [Figs 40, 41] in Mendoza city during 22-23 January 2019 consulting with the resident artist, Cecilia Scoones [Fig 42], over details of her drawing of *V. abbreviata* for this publication [Fig. 56], we reviewed every unidentified *Viola* specimen sheet there. Among other items of considerable interest, our close examination of one gathering made as long ago as 1954, also another from 1956, revealed them to be further specimens of *V. abbreviata*, [Figs.43, 44]. They're cited under 'Other material examined and further recorded locations' below. Like the very recent discovery described immediately above, both originate from Malargüe Department of Mendoza Province, and are situated close together at the same general location 40 km further north of the AGS site.

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NB. Similar looking viola rosettes out of flower have also been collected in the general area of the major disjunction between the Neuquén and Malargüe groups. These may well be further intermediate populations connecting them. Future investigations and explorations of these little-visited sectors at the appropriate time should provide the answer.



Fig.43: One of the two gatherings of *Viola abbreviata* we identified at MERL, both from new locations close together beside the border with Chile in Malargüe, Mendoza. (22 Jan 2019. JMW)

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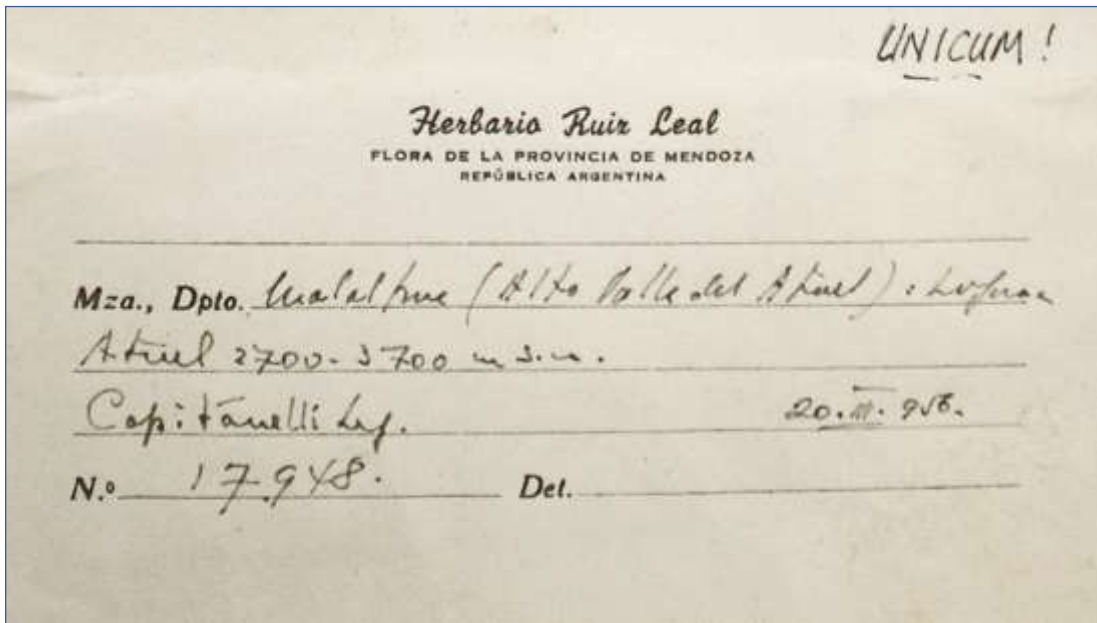


Fig.44: The collector's original 1956 field note for the sheet with five specimens of *Viola abbreviata* from beside the border with Chile in central Mendoza. (22 Jan 2019. JMW)



Fig.45: The South American subcontinent, showing the location of *Viola abbreviata* in Argentina.



Fig.46: Argentinian provinces, with marks and arrows indicating the two, Neuquén and Mendoza, where *Viola abbreviata* occurs (three locations at each mark). The disjunction is evident.



Fig.47: Overall *Viola abbreviata* distribution, type site arrowed as red-centred green circle. The topmost circle represents 2 localities too near together to be separated on the map.

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Fig.48: The close-set trio of southern locations of *Viola abbreviata* in the Chos Malal department of Neuquén Province. The type site (Cerro Wayle) is the arrowed, red-centred green circle.



Fig.49: F.& W.11875 *Viola abbreviata* at the Wayle type site. This remarkable little plant, absolutely unmistakable in flower, is here at its most abbreviated form. (25 Nov 2009. JMW)

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Fig.50: A plan view of the heavily veined form of F.& W.11785 at the type site, Cerro Wayle, showing the remarkable quantity of flowers and spiralling leaves. (25 Nov 2009. JMW)



Fig.51: The style crest with its central lobe is clearly visible in this close-up of F.& W.11785 *Viola abbreviata* at the Cerro Wayle type site. (25 Nov 2009. JMW)

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Fig.52: The locations of *Viola abbreviata* in Malargüe Dept. of Mendoza Prov. The upper two sites are too close to separate at this scale, so are represented by one blue-centred green circle.



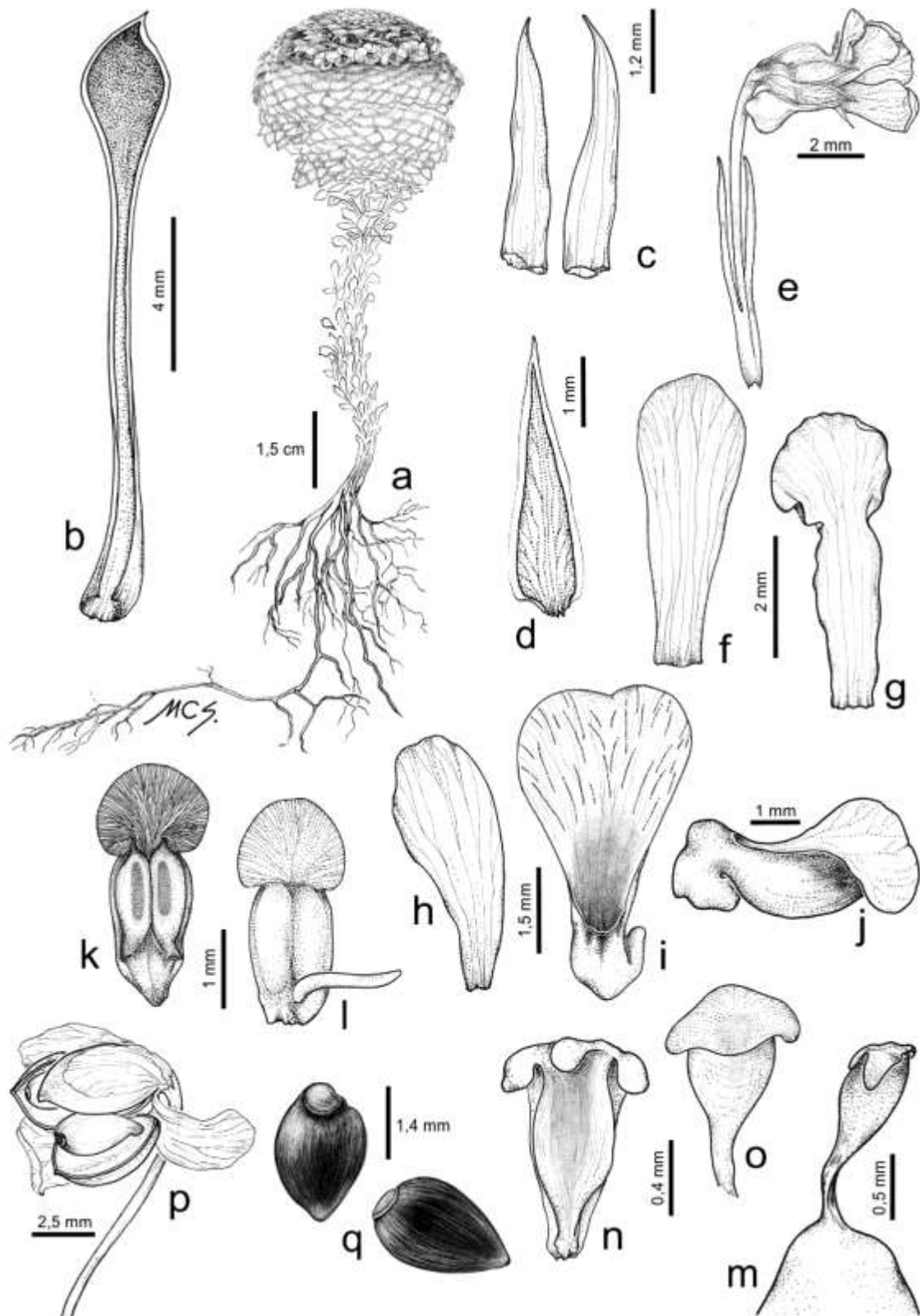
Fig.53: *Viola abbreviata* at the AGS group's Malargüe site, this specimen notably columnar and with multiple rosettes. (13 Dec 2018. David Haselgrove)



Fig.54: Another multiple-rosetted specimen of *Viola abbreviata* photographed near the Malargüe vehicle track, this one more compact and greenish grey. (13 Dec 2018. David Haselgrove)



Fig.55: A close-up of flowers of one of the individuals of *Viola abbreviata* found by the AGS tour group in Malargüe Dept. of Mendoza Province. (13 Dec 2018. David Haselgrove)



a) Mature leaf. b) plant. c) bracteoles. d) sepal. e) flower. f) upper petal, narrow form. g) upper petal, round form. h) lateral petal. i) bottom petal. k) anther and connective. l) anther with nectar spur. m) style and crest. n) style crest, top. o) style crest, beneath. p) Capsule with seeds. q) seeds.

Fig.56: Botanical illustration of the new *Viola abbreviata* based on several specimens and photographs. (Artist - Maria Cecilia Scoones, Mendoza)

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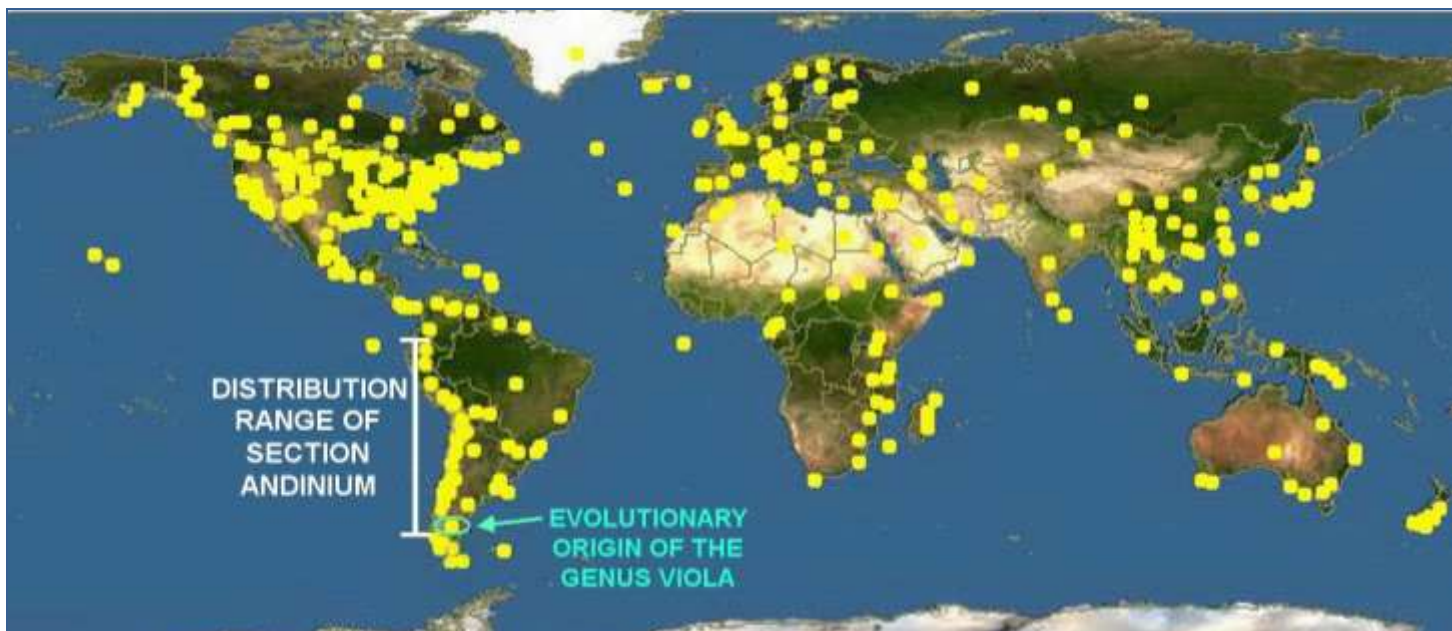


Fig.57: World distribution of *Viola* (yellow points) with region of evolutionary origin and longitudinal range of sect. *Andinium* indicated. (Basic map and locations by Discover Life)



Fig.58: F.& W.12618 *Viola skottsbergiana*, one of three species thought to be most closely related to *Viola abbreviata*. Paso Vergara, Rancagua, Chile. (17 Dec 2013. ARF)

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Fig.59: Our F.& W.12330 *Viola vortex* (ined.) has flowers which are most similar in size and shape to *Viola abbreviata* - but they are bearded, not glabrous. (10 Dec 2010. ARF)



Fig.60: *Viola pachysoma*, which shares the glabrous, white flowers of *Viola abbreviata*. But these are much larger and a different shape. Copahue, Neuquén. (13 Jan 2010. Kees Jan van Zwienen)

Taxonomy

Viola abbreviata J.M. Watson & A.R. Flores, sp. nov. [Figs. 21, 28, 35, 43, 49-51, 53-56, 61, 62]

Type: ARGENTINA. Neuquén Province, Chos Malal Department, Parque Provincial El Tromen, Cerro Wayle, 37°04'00"S 70°06'55"W, 2600-2700 m, 24 Dec 2002, leg. A.R. Flores & J.M. Watson, F.& W. 10635! (holotype CONC; isotype herb. Flores & Watson).

Diagnosis: The new species differs from all other taxa of the rosulate, sempervivoid alliance of *Viola* section *Andinium* by its usually exserted, proportionately large, bulbous calyx and diminutive, glabrous, white corolla of ca. 5 mm diameter. Its apparently nearest relatives, *Viola pachysoma* M. Shaver & J.M. Watson, *Viola skottsbergiana* W. Becker, and *Viola vortex* J.M. Watson & A.R. Flores (in press), all of them also always or predominantly white flowered, possess less globose calyces relative to corolla size. In addition *V. skottsbergiana* and *V. vortex* have bearded lateral petals, while the corolla of *V. pachysoma* measures approximately four times the area of that of *V. abbreviata*.

Description: *Life form* perennial, rosulate, glabrous, evergreen hemicryptophyte. *Rootstock* axial, 12-15 cm or more long x ca. 2 mm dia. at junction with caudex, subligneous, solitary above for 2-4 cm (as seen), branching into multiple feeder roots below. *Caudex* to ca. 6 cm (usually shorter), simple or branched, enveloped in much-reduced living foliage or vestiges of dead vegetation. *Plant* solitary to forming cushions of few rosettes, rarely as many as ten. *Rosette* ca. 3.5-6 cm dia. x 1.5-6 cm high, densely imbricate to base, dome-shaped to columnar, usually cryptic rust-brown, greenish brown or grey-green, rarely dull grey, more or less depressed towards centre of face. *Leaves* spatulate, ca. 1.6 cm when mature, arranged in distinct spirals, estipulate; *pseudopetioles* 9-11 mm, narrowly plane, more or less thick and fleshy; *lamina* 5-6 x 2.5-4 mm, entire, broadly obovate to suborbicular leathery-succulent, apex apiculate, margin ca 0.2-0.25 mm wide, thin-cartilaginous, pale-translucent. *Anthesis* more or less simultaneous, but prolonged. *Flowers* ca. 5 mm high x 5 mm wide, axial, solitary, forming dense multiple ring around upper circumference of rosette. *Peduncles* ca. 10-15 mm x 1-2.5 mm dia, occasionally equal to, usually somewhat shorter than leaves; *bracteoles* adnate with base of peduncle for 1.8-3 mm, free above for 3.5-6 mm, narrowly linear with acute-subulate apex, hyaline. *Calyx* 4-7 x 3-4 mm, bulbous; *sepals* 4-7 x 1.5-3 mm, equal, entire, free from base but imbricate laterally except for triangular, acuminate, outcurved apical half, border hyaline. *Corolla* glabrous, white, occasionally faintly tinged pale violet-blue on apex of petals, more or less strongly veined dark violet-blue on inferior petal only, or on inferior petal and lower half of lateral petals, or on all petals; inferior petal with pronounced pale to deep yellow throat; reverse of all petals either strongly stained dark indigo-blue overall, or longitudinally except for white margins; *petals* deeply inserted into calyx to ca. half length; *superior petals* 4.5-5 x 2-3.5 mm, somewhat expanded and rounded apically to suborbicular above, broadly incurved-linear towards base; *lateral petals* 4.5-5 x 2-3.5 mm, somewhat expanded and rounded apically to suborbicular above, broadly incurved-linear towards base; *inferior petal* 4.5-5 (including horizontal base of spur) x 3-5 mm, broadly obovate with margins upcurved, strongly so towards base, apex rounded, entire or slightly emarginate; *spur* 2 mm x 2 mm maximum diameter, shortly protruberant directly behind inferior petal, the main stout and subcylindrical to irregularly tapering body directed more or less downward or downward and somewhat forward. *Androecium* and *gynoecium* exserted, readily visible; *anthers* ca. 2 mm, lower pair with 2 mm filiform nectar spurs; connectives shorter than anthers, ca. 0.8 mm, dull golden yellow; *style* somewhat geniculate, clavate; *stigma* small circular aperture sited between style crest lobes. *style crest* as single strongly recurved short lateral lobe-arm either side of style head with suberect to recurved shorter central, apical lobe. *Fruit* 6 mm, orbicular, tri-valved capsule containing up to 8 seeds, these 2.5-3.5 mm, lacrimiform, maroon-brown.

Field note: The small, rather scattered population is situated on a shallow slope with southern exposure (i.e. facing slightly away from the full sun) just below the shallowly east-facing rounded crest

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of the gently sloping mountain ridge of a long-inactive volcano. The terrain has a surface of scattered rock rubble, and is vegetated predominantly by an open cover of a small, tough Poaceae species, with occasional clumps of low shrubs in the lower sector. A varied dwarf herbaceous and cushion flora inhabits the flatter clearings and spaces between the grasses and higher exposed sites. As well as *V. abbreviata*, these include *Benthamiella graminifolia* Skottsbo., *Oxalis erythrorhiza* Gillies, *Pantacantha ameghinoi* Spegazzini, *Polygala salasiana* Gay, *Sisyrinchium laetum* (Ravenna) J.M. Watson & A.R. Flores: also an unidentified *Adesmia* sp. and an *Azorella*, the latter out of flower as seen.

Other material examined and further recorded locations: ARGENTINA. Mendoza Province, Malargüe Department, alto Valle del Atuel, quebrada del Arroyo Nield, 3900 m, 9-17 Jan 1954, leg. Guimon Pagi, MERL 15734! (2 specimen sheets) (paratypes MERL). ARGENTINA. Mendoza Province, Malargüe Department, (source of) Río Atuel, 2700-3700 m, 20 Mar 1956, leg. Capitaneli, MERL 173948! (paratype MERL). ARGENTINA. Neuquén Province, Chos Malal Department, Parque Provincial El Tromen, Cerro Wayle, 37°04'00"S 70°06'55"W, 2600-2700 m, 25 Nov 2009, leg. A.R. Flores & J.M. Watson, F.& W. 11875! (specimen D or lost*). ARGENTINA. Neuquén Province, Chos Malal Department, Parque Provincial El Tromen, Cerro Negro, 37°06'30"S 70°19'40"W, 2100 m, 27 Nov 2009, obs. J.M. Watson & A.R. Flores (the population was much too small to provide a reference specimen). ARGENTINA. Neuquén Province, Chos Malal Department, Parque Provincial El Tromen, Volcán Tromen, Nov 2002, video record by Parque Tromén rangers, s.n.! (no known reference specimen). ARGENTINA. Mendoza Province, Malargüe Department, road to Paso de las Damas, 35°03'35.87"-35°04'31.19"S 70°11'37.94"-70°11'44.35"W, ca 2600 m, 13 Dec 2018, digital photographic records by D. Haslegrove and members of Alpine Garden Society (AGS) flora tour group, s.n.! (no existing reference specimen as collection of all plant material is forbidden on AGS tours).

***Note:** This important 2009 specimen, taken in full flower, cannot be traced at present and may either be displaced in our Flores & Watson herbarium, or lost in transit during the botanical drawing process. However, we've made the fortunate discovery that the earlier 2002 specimen contains sufficient critical floral morphology to serve as the holotype. Photographs of F.& W. 11875 are nevertheless used herein to illustrate the species in habitat at the type location.

Distribution: As presently known *Viola abbreviata* is a disjunct Argentinian endemic with three adjacent locations in the Chos Malal Department of northern Neuquén Province separated from one another by no more than 20 km, and a further three remote sites ca. 300 km to the north, one of them recently discovered. All three of the latter are situated in northern Malargüe Department of central Mendoza Province, not far from the border with Chile. The maximum distance between any of these is approximately 40 km. [Figs.45-48, 52]

Overall environment and habitats: *V. abbreviata* exhibits a considerably wide range of elevational tolerance, from ca. 2100 m at its most southern limit to 3900 m at the northernmost extension. Basic habitats are as an element of the Andean steppe and upper Andean floras, always in clearings among relatively dispersed low to dwarf vegetation, or in isolation, with minimal or no competition, as typifies these sempervoid violas. It apparently favours level or fairly level sites and soils of volcanic origin, usually surfaced with rock rubble. When the plant grows up through an open, airy layer of large fragments, the caudex tends to be long with a covering of reduced, live foliage. We were informed that on Volcán Tromen the species grows on its own at the upper limit of flowering plants. A similar lone pioneering life-style may be suspected for the highest recorded elevations at the end of the Río Atuel valley by the Andean watershed in Malargüe Department, Mendoza province, and possibly some of the habitats slightly lower down there. These maxima are in the region of 3700-3900 m. On the approach to the Paso de las Damas, also in Malargüe, *V. abbreviata* was found in open spaces between continuous bunch-grass steppe on flat terrain at a lower register of 2600 m, including directly beside the vehicle track. On more open, stony rises nearby containing minimal grass presence, a variety of dwarf Andean flora was observed, with cushions of *Azorella monantha* predominant. Open

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dwarf grass cover is the similar basic vegetation background on Cerro Wayle where *V. abbreviata* grows, with other dwarf Andean species again occupying barer, open sites on the ridgetop. The only habitat on Cerro Negro we reached was of very limited area, exposed, level and covered in small, angular rock shards between large, angled outcrops. Plant cover there is minimal and dispersed, a mixture of prostrate, ligneous cushions and tough, dwarf grasses, as well as the four specimens of the new species we located.

Phenology: Across its geographical and elevational ranges *V. abbreviata* presents an uninterrupted but relatively prolonged flowering period from November to January. Fruiting and seeding follow approximately one month after anthesis.

Etymology: We consider some morphological reference to the remarkably reduced size of the new species, most consistently displayed by its flowers, to be the most appropriate epithet. Among the approximately 2000 listed species of *Viola*, all but one of the Latin adjectives indicating small or diminutive, including of flowers, have already been legitimately published: *minima*, *minuta*, *minutiflora*, *parva*, *parviflora*, *parvula*, *perpusilla*, *pusilla* (Stearn 1966, The Plant List 2013). The outstanding one, *perparva*, remains available, but we feel it is not distinct enough for this special little rosulate and would be unnoticeable among similar epithets. We have therefore settled on *abbreviata* as representing "abbreviate, adj. relatively short (esp. in nat. hist.), [f. Latin *abbreviatus* p.p. of *abbreviare* shorten ...]" (H.W. & F.G. Fowler 1951).

Proposed conservation status: Of the six known populations, three fall within the same locally protected area, the Parque Provincial El Tromen. As such they would seem to be relatively safe, despite the extremely limited numerical count and spatial confines of all three. However, the essential drawback of the park is the considerable quantity of herds of goats which are permitted as a traditional source of livelihood of many local inhabitants. Most damage as a consequence of heavy grazing occurs on the flatter low plains and dense sectors of bush grass. It is probable that due to their upper mountain habitat and relative isolation from continuous vegetation these rare violas may not be seriously threatened, and the same factors may be operative for the other three remote colonies. (Population statistics for two of the latter are unknown.) However, the category VU (vulnerable) is recommended as a precautionary measure at least.



Fig.61: A close-up of the heavily veined form of F.& W.11875 *Viola abbreviata* on Wayle (25 Nov 2009. ARF)

The genus and its major section *Andinium*

Viola is cosmopolitan and of mainly temperate and high tropical mountain distribution, being largely absent from deserts, rain forests, tundra and the polar

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regions [Fig.57]. With an estimated 610-650 known and accepted species it is the largest genus of its family, Violaceae, and is comprised of 16 sections, the majority endemic to the Northern Hemisphere (Wahlert *et al.* 2014, Watson & Flores 2018b). Despite this geographical imbalance, *Viola* has been found to have evolved ca. 35 Ma years ago in what is now the southern end of South America [Fig.57] (Clausen 1929, Ballard *et al.* 1999, Marcussen *et al.* 2012, Marcussen *et al.* 2015). Accordingly, it contains species considered to be of the most direct ancestral origins in three of its sections, two of which are endemic to the subcontinent.

By far the largest of those three sections, and the largest in *Viola* as a whole when its unpublished but accepted species are also taken into account, is the section *Andinium* (Watson & Flores 2018b). These are the remarkable little plants known collectively as the Andean rosulate violas, which are distributed between the equator and southern Patagonia [Fig.57]. Their full complement as recognised by ourselves consists of 101 taxa listed in IPNI (2019), plus the present species and a further 38 waiting to be described or collected, which are known either as specimens - or in a few instances as reliable photographs (Watson & Flores *ined.*). *Andinium* is still poorly understood compared with the other sections, having been almost ignored botanically between the death of its author, Wilhelm Becker, in 1928, and the mid-1990s. Nevertheless, Marcussen *et al.* (2015) have been able to calculate that it split from the rest of *Viola* as early as 29 Ma. This revelation, together with the section's specialised adaptation to developing Andean uplift and more recent mediterranean geoclimatic conditions, explains why so many of its taxa are so dramatically different from the rest of *Viola* (Watson & Flores 2012a, 2013a, 2013c).

The new species clearly belongs in the large, southern, rosulate, sempervivoid component of sect. *Andinium*, which currently contains 19 published species and one natural hybrid. That total includes the novelty herein (Watson & Flores *ined.*). The group extends from central Chile and Argentina down to southern Patagonia. It is circumscribed by its morphology of invariably perennial, glabrous taxa with entire to minutely serrate or ciliate leathery foliage, the leaf blade with an apiculate termination. Their life form is hemicryptophytic and stemless, with multifoliar, more or less densely imbricate rosettes. We consider this structure to be basically long-established in the section, and that it has developed as a pioneering response to exploit volcanic and other upper Andean unstable conditions where aggressive competition is incapable of existing (Watson & Flores 2013b).

The precise relationship of *V. abbreviata* within these sempervivoids is less clear, and probably requires molecular analysis for clarification. However, on the basis of critical morphological dissimilarity of foliage and floral parts most of the other 19 taxa can reasonably be eliminated as close relatives. Those, together with *V. skottsbergiana* [Fig. 56], *V. pachysoma* [Fig. 57] and *V. vortex* [Fig. 58], the three that apparently correspond to some significant degree with *V. abbreviata*, are differentiated from the latter in the following key.

Key to distinguish *Viola abbreviata* among more or less rosulate species (sect. *Andinium*), as found exclusively in South America between Ecuador and Patagonia

(NB. It has not been considered necessary to provide the formal full epithets and authors for the 17 violas listed by name under couplets 2 and 3 below.)

1. Plants annual or perennial, rarely rhizomatous or ericoid, stemless or not, imbricate or not, usually with distinct indumentum on at least some foliar parts, often with crenate margins to leaf blade, this flexible, or if not, then lacking apiculate tip, Rosette when present never columnar. (Ecuador to S Patagonia) ... sect. *Andinium* species other than sempervivoid alliance.
- Plants perennial, never annual, rhizomatous, ericoid nor stemless, always more or less densely imbricate, glabrous or occasionally minutely ciliate on leaf blade margin.

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- Leaf blade entire or minutely serrate, subsucculent and rigid, with apiculate tip. Rosette columnar or not. Sempervivoid alliance. (Central Argentina and Chile to S Patagonia) ... 2.
2. Corolla dark coloured, blue or yellow, never white. (Central Argentina and Chile to S Patagonia) ... *VV. auricolor*, *atropurpurea*, *comberi*, *coronifera*, *leyboldiana*, *portulacea*, *sempervivium*.
- Corolla base colour always or sometimes white ... 3.
3. Corolla large, clearly twice or more as wide as mature leaf blade. (Central Chile and Argentina to N Patagonia) ... *VV. aizoon*, *x blaxlandiae*, *beckeriana*, *columnaris*, *cotyledon*, *dasyphylla*, *lologensis*, *petraea*, *rossowiana*, *santiagonensis*.
- Corolla always or sometimes less than twice as wide as mature leaf blade ... 4.
4. Corolla with indumentum on lateral petals ... 5.
- Corolla glabrous ... 6.
5. Style crest long, strongly recurved. (Chile, Libertador General Bernardo O'Higgins Region) ... *Viola skottsbergiana*
- Style crest short, patent. (Chile, Metropolitan [Santiago] Region) ... *Viola vortex*
6. Calyx always concealed in rosette, narrow. Corolla ca. 10 mm x 10 mm. (Argentina, Neuquén) ... *Viola pachysoma*
- Calyx usually more or less prominent and visible, bulbous. Corolla ca. 5mm x 5mm. (Argentina, Neuquén to S Mendoza) ... *Viola abbreviata*

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Fig.62:
A farewell shot
of F.& W.11875
Viola abbreviata
living up to its
name - as
witness this
comparative
indication of its
dimensions. (25
Nov 2009. JMW)

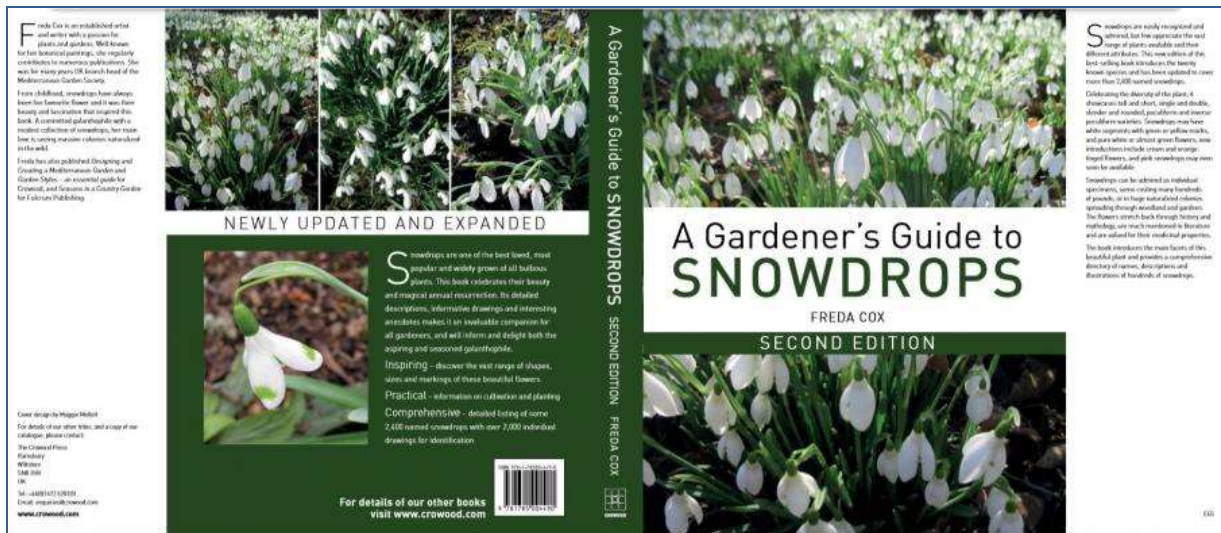


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Another of Cecilia Scoones' drawings of *Viola abbreviata*.

---Book Review---



'A Gardener's Guide to Snowdrops' - review by Anne Wright.

The enlarged second edition, as a stand-alone book, is a unique and indispensable reference guide for snowdrop fans, with the directory of snowdrop species and cultivars now comprising three quarters of the book.

Each entry in the directory shows a simple illustration of the cultivar/species, and information including a description of the flower and foliage, the origin, and the height. Some cultivars also have the flowering time; though this will obviously vary according to season and location, it is a useful comparison of early or late flowering times.

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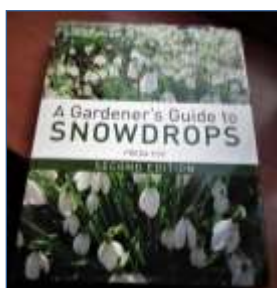
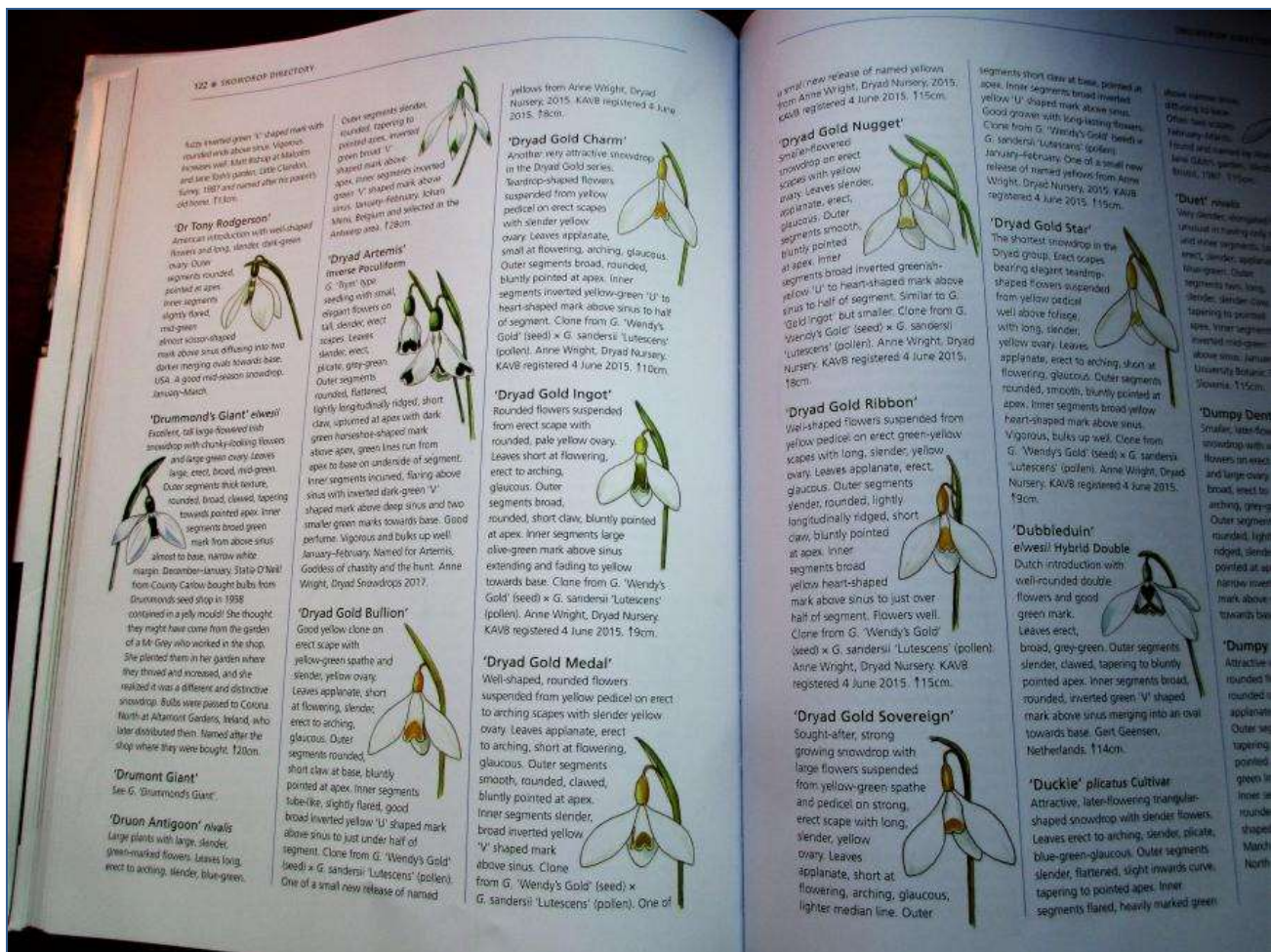
The cultivars are listed in alphabetical order of their cultivar names, so it is easy to find a particular variety, even if you don't know which species it is derived from.

The rest of the book covers history, uses, taxonomy, morphology and a useful section on pest and disease problems. There is a list of gardens in alphabetical order where snowdrops can be seen, both in the UK and abroad, and a fairly comprehensive list of nurseries which sell snowdrops.

I suspect the publishers had a problem with enlarging the directory, while keeping all the other information in the first edition and keeping the book to a reasonable size. While it is unfortunate that this has led to a reduction in the excellent cultivation and propagation guides, the increase in listed cultivars reflects the recent rapid growth of interest in collecting snowdrops, and the large number of new cultivars introduced in recent years. An updated list of varieties was badly needed and this edition will fill that need for collectors and beginners alike.

My personal feeling is that I would rather have retained some of the cultivation information, while losing the eight-page section which is a list of people/personalities in the Galanthophile world, but that is just a plantsperson's preference.

Apart from these issues, this volume is bound to become THE reference guide for serious snowdrop enthusiasts wanting to find out about different cultivars – maybe it should more properly have been titled 'An Enthusiast's Guide to Snowdrops'!



[‘A Gardener’s Guide to Snowdrops’ \(second edition\) - author Freda Cox,](#)
published by [Crowood Press](#). ISBN 978 1 78500 449 0

Anne Wright runs [Dryad Nursery](#) near York, specialising in galanthus and narcissus. Another review of this book, by the plantsman, Ian Christie, was published in The Rock Garden, journal of SRGC, January 2019. You can read that review by [clicking this link](#).

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---Plants in habitat---

Orchids and winter-flowering species of Gran Canaria: by Iep & Gerrit Eijkelenboom.

Many of us in North-Western Europe would like to escape from winter. The possibilities are restricted since there are few regions left where we find agreeable temperatures and sunshine. Only the Spanish coast from Denia to the Portugese border and the Algarve, offer us average winter temperatures of 15 degrees and sunshine. For us, as plant lovers, there is enough to find, see my report on the winter-flowering species in [South-Eastern Spain from IRG 81](#).

The Canary islands are in many ways an alternative. The temperatures are more pleasant. We may expect 20 degrees and the night temperatures are not below 17. On the other hand, the islands are more expensive than the traditional "costas".

My wife and I decided to spend our Dutch winter on Gran Canaria. But we avoided the overcrowded Southern coast with the tourist enclaves of Playa del Ingles or Maspalomas. During the months of January and February, we rented a lovely cottage in the valley of Agaete, situated in the the North-West. Unfortunately the weather was extremely bad.



The valley of Agaete



Gran Canaria is somentimes called "the little continent". All the landscapes you usually find on a continent occur here.

Because of that, Gran Canaria is very beautiful; a fact that, sadly, is poorly known. Most of the crowd spend a week or a fortnight in one of the numerous "urbanizaciones" in the south, not aware of the beauty of the interior.

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The beauty of the interior of the island.

The orchids:

On Gran Canaria four species occur.

Gennaria diphylla: (below) A species growing in the Laurel forest of Los Tilos de Moya. The small bell-shaped flowers are yellowish-green, therefore hard to find between the other species. The leaves, broadly heart-shaped and clasping the stem, are distinct.



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Habenaria tridactylites: A relict of an ancient Atlantic flora, surviving in the laurel forests. We found this remarkable orchid at many places on the island. It grows on shady cliffs, mossy, or rocky slopes, Observing the yellowish-green flower, you see a hood, formed by the petals and the dorsal sepal, which is usual in many orchids. The lip is three-lobed, with three equal lobes, pendent.



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Orchis canariensis: The most spectacular orchid of the island. Very showy and hard to find.



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***Neotinea maculata*:** This species comes into flower in the early spring. We only spotted the new leaves amongst pine needles. To be able to show it, I added a flowering plant from Cyprus.



Neotinea maculata - shown in flower from Cyprus

The winter-flowering species:

It is also winter in January and February on the Canary Islands. That means, except in the very south around Maspalomas, days with rain, days with stormy winds but on clear days, a glowing hot

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sun. Nature has its winter dormant period. There is no abundant bloom, which is as you might expect. Nevertheless, there is a lot to see because we are not familiar with the flora. Many species are endemic, which is understandable, due to the isolated location of the Canary Islands. In my report, I do not mention it all the time.

The **Laurel forest** also called **Laurisilva**:

Due to the presence of north-east trade winds, moisture condenses out to form clouds and eventually rain. Because of this phenomenon a great part of Gran Canaria was covered by this type of subtropical forest. Nowadays this forest is restricted to one canyon, called *Los Tilos de Moya*, the forest is characterized by broadleaf trees with glossy, elongated leaves, *Laurus novocanariensis*.



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Canarina canariensis is a member of the Campanulaceae, also called the Canary bellflower. It grows not only in the laurel forest, but on other locations too. It is a scrambling perennial, very showy. In cultivation, we must notice, it does not tolerate temperatures below zero even though it has been given the [RHS Award of Garden Merit](#).



Sonchus congestus makes a strong architectural impression. We saw many tree-like specimens. It forms a trunk, topped by clusters of yellow composite flowers. It fits in well in this seemingly pre-historic forest.



Sonchus congestus

Sonchus leptcephalus (below) is a rare member of this genus. The plant looks like a shrub, richly branched with many linear leaves of about 1 mm broad. The leaves are crowded at the top and it forms some clusters of yellow flowers. Not many as you should expect on a large plant like this.



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Aichryson villosum covers the humid ground in the forest. It belongs to the family Crassulaceae.



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Isoplexis chalcantha, flowering at the entrance of the visitor centre, is a rare species and on the IUCN Red List of Threatened Species. It is now sadly close to extinction. Many plant enthusiasts would like to grow it in the garden because of the stunning orange colour. It has been said to be a plant for dry garden, which is doubtful. It is found within the Laurel forest, a humid and shady place. Pollination is by flower visiting birds, particularly the Canary Islands chiffchaff.



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Above: *Isoplexis chalcantha* Below: The Canary Islands chiffchaff, *Phylloscopus canariensis*.



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Lavandula canariensis, grows in the forest on one of the few sunny spots. It may be found all over the island, from the mountains to the coast.



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Coastal vegetation.

The plants at the coast are exposed to extreme circumstances. The unrelenting heat and light of the sun strikes them. The continuous heavy winds makes them stay low. Drought gives them another problem. The coastal flora has been adapted to all of this and it is great to see how they survive. Many cushion forming plants are hiding between the rocky surfaces, a stunning view.



Heliotropium crispum: It was so nice to see it flowering under such difficult circumstances. On the other hand, without competitive species, it can take advantage and become rampant.



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Lotus glinoides: Most Lotus species are yellow, so this one was easy to distinguish. A nice looking dwarf annual, with greyish leaves and a lovely pink colour.



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Helianthemum canariense: Not really endemic, in spite of its name, It grows in Morocco and Western Sahara too. It is a few flowering species apparently. We saw just one or two flowers at the time. The buds are rather green so easy to overlook.



Chenoleoides tomentosa

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Chenoleoides tomentosa, according to The Plant List this is a synonym of *Bassia tomentosa*. According to [Flora de Canarias website](#), [ctrl-click to open the hyperlink, then click "nombres comunes", then click "volver", choose letter C.] it seems a little different from *Bassia tomentosa*. A plant with rounded thick, fleshy and hairy leaves, forming a shrub in a sheltered place, height 50cm. Most of the many plants, exposing to the strong winds, stay low and form lovely cushions.



Kleinia neriifolia*, syn. *Senecio kleinia grows on the rocky slopes and ravines towards the sea. It is the only succulent *Senecio* in the islands. It is like a miniature of the dragon tree (*Dracaena draco*) and the long leaves make us think it is an oleander. The species name means "with leaves like Nerium" (oleander).



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Euphorbia aphylla is a short shrub growing up to 50cm. The stemless flowers appear at the end of the stem. Masses of slender stems are rising from the ground. It is a salt-tolerant plant (halophyte) They do not really prefer saline environments, but they face much less competition in these areas.



About the next species there is some confusion. According to The Plant List, the name is ***Pogonorrhinum scoparium***. The name ***Nanorrhinum scoparium*** has also been used. ***Kickxia scoparium*** is the most common name, but "unresolved". The plant is hiding between the leaves of other species. The yellow flowers are waving in the wind above the the sheltering host.



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The hotel is not visible on the picture above, but what we see is a great escape from its garden. The rocks are covered by flowering *Delosperma sp.*, native to South Africa. It was a stunning view.

Vegetation in the foothills towards the mountains: Most of the winter flowering plants grow between sea level and about 1000 m. The picture shows the skyline of Tenerife, with the Pico del Teide. (3718 m)



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Malva canariensis, syn. ***Malva acerifolia***, syn. ***Lavatera acerifolia***. The latter is the most common name.



Parolinia filifolia, an endemic genus with thread-like leaves, grows in the Agaete Valley.

Below: ***Parolinia ornata*** along a road towards the mountains.



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Campylanthus salsoloides is a member of the Scrophulariaceae, like *Kickxia* and *Isoplexis* above. The ornamental flowers in whorls at the end of each stem wave in the wind.



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Salvia canariensis is a shrub, 2m high and 1,5m width. It has woolly stems. The velvety leaves are silvery-green and covered with long white hairs. It grows under extremely dry circumstances in the Barranco Guyayadeque, a ravine-type valley, which is very interesting to visit.



Argyranthemum frutescens growing in the wild on Gran Canaria, from the coast to up to 700 m in the mountains. We found it in masses near Agaete. We know this plant as a good and ornamental garden plant.



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Bencomia caudata is one of this genus of four rare plant species native to the Canary Islands. The flowers at the end of purple stems have the same colour. Together with the flowers we see densely packed, globular fruits. The shrub reaches a height from 1 to 4 metres. It is on The IUCN Red List of Threatened Species. (Status: Near Threatened)



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Echium decaisnei (above) is the most commonly occurring species of this genus on the island. From sea-level to the low mountains you may see them; impressive shrubs along the roads. The blue form, on the other hand, is very rare. We were lucky to find this stunning individual. Maybe it is the subspecies *Echium decaisnei* subsp. *purpuriense*.



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Echium decaisnei subsp. *purpuriense*

Another echium, a most desirable species to find is ***Echium wildpretii***. It is a species native to the island of Tenerife and La Palma, but unmistakable. We have found the rosette of this species in a ravine on Gran Canaria. Please, [open this hyperlink](#) to see the amazing flowers.



Echium bonnetii is a low annual growing on areas of wasteland. The flowers have a lovely blue colour.



Periploca laevigata is an impenetrable shrub, colonising parts of the slopes towards the mountains. At first sight one does not see the flowers. They are green and brown, but after some time you see how beautiful these complicated structures are.

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This, above, is ***Aloe vera*** in the wild. It is a plant which features at subtropical regions, in almost every garden. It is a succulent, renowned for its medical qualities and cosmetic use.



Sonchus pinnatifidus grows on cliffs and makes rosettes with leaves looking like oak-leaves. From the rosette a stem grows with the well-known sonchus flowers. It is a very good looking plant. The first picture, above, shows the plant from a short distance, the second, right, from far away.



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Cytisus proliferus is a tree, originated from the Canary Islands and became naturalized in Mediterranean-type climate areas. It is a leguminous, providing food to goat and sheep. It grows in the lower foothills on embankments in often sandy and volcanic soil. The pea-like flowers are creamy white in colour and borne in clusters.



Oxalis pes-caprae is an invasive weed in great parts of the world, for instance the USA, (California) Europe, Israel and Australia. It is very difficult to eliminate once it has spread over the land, because of the underground bulbs. On Gran Canaria the double form is the dominant form and less invasive. It has been used as an ornamental garden flower.

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Ranunculus cortusifolius, the Canary buttercup. It grows throughout the Canaries and Azores Islands but is widely cultivated as an ornamental. Of course it is not hardy, but one may grow it as an annual.



Aeonium arboreum is an ornamental with large bright yellow flowers. It grows in desert regions, such as the Barranco de Guayadeque where the picture was taken.

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The genus *Pericallis* occurs on the archipelago of the Canarias. Each island has its own species which is mostly endemic for that specific island and differs from the others by its colour.



Pericallis webbii is endemic to the island of Gran Canaria. The central disc is purple and the petals are white to lilac. It is a very lovely perennial species. We found it in the valley of Agaete and the Laurel forest.

Mountainous species.

The highest point on the island is the Pico de las Nieves, elevation 1949m. According to its name, snow occurs often. The interior of Grand Canaria is extremely mountainous. We hoped to find interesting plants and flowers, but it was somewhat disappointing. It was cold, rainy and foggy. We hardly found anything! This is what we found:



Aeonium simsii is a succulent plant, with small rosettes of leaves. It forms dense and stunning cushions on the walls of the rocks. At first sight, you may think it is a *Sempervivum*. It blooms later in April or May.

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Aeonium aureum (syn. *Greenovia aurea*) grows in the same habitat as *Aeonium simsii*, as you can see on the picture. The colour of the succulent leaves are greyish-green. The soil in which it grows is somewhat volcanic.



Great parts of the vertical rocks along the roads in the interior of the island are covered by this species, *Aeonium aureum*. An amazing sight.

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Aeonium percarneum is endemic to Gran Canaria. It is a branched *Aeonium* with greyish-green succulent leaves. The cultivar 'Kiwi' is an attractive and showy plant with brilliant coloured leaves favoured by collectors of succulent plants.

Our cottage was situated in the Agaete valley, a fruitful place, with a lot of fields and orchards. The owner of the house owns a large orchard with all kinds of fruit trees with many avocado-trees amongst them. He was proud to give us a guided tour and told about the many kinds of avocado he was growing. Most of them are not suitable for export, because of their vulnerability. They are sold on the local markets. We have eaten them and they taste like.....avocados.



Assorted avocados!

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In "our" valley lived a kestrel, a Canary Islands kestrel, scientific name: *Falco tinnunculus canariensis*. A female, with plumage in brownish-red with dark barring and a brown head. A great part of her life is spend perching and resting and that's why we saw her every day as we left the house, sitting on "her" branch. The diet is composed of rats and mice, but also amphibians and reptiles.



In the little garden in front of our cottage we saw every day a butterfly, without paying attention, till the owner draw our attention to it. It was the monarch butterfly, the famous North-American *Danaus plexippus*. It is notable for its annual migration from the northern US to Florida and Mexico. During the fall they travel

over thousands of kilometres. Its name was believed to be given in honour of King William III of England, the Prince of Orange, because of the orange colour of the wings.

Monarch butterflies have colonised great parts of the world including the Canary Islands. The caterpillars eat the poisonous leaves of the *asclepias* plant and themselves become poisonous. After this they are invulnerable.



Monarch butterflies have colonised great parts of the world including the Canary Islands. The caterpillars eat the poisonous leaves of the *asclepias* plant and themselves become poisonous. After this they are invulnerable.

Bulbous plants.

Dipcadi serotinum is an abundant species, growing in coastal rocky areas up to the lower mountains (1000 m). I know it from southern Spain and it grows in Portugal as well.



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Dipcadi serotinum var. *fulvum*. Both the yellow form and the brown form should be easy plants in cultivation, but hardiness is doubtful.

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Allium subvillosum is a Mediterranean species, growing from a bulb in sandy soil from Greece to Portugal and North-Africa. It blooms with many white flowers in wide umbels. The anthers are yellow.



Allium roseum is the most common garlic in the Mediterranean area and the Canaries. It is a spring flowering species and we found just one individual, flowering poorly.



Scilla haemorrhoidalis

Flowers appear late winter and suddenly you see them everywhere. It not a rare species. The name means 'blood red' and refers to the red stem. The lovely blue anthers are striking. The broad and relatively large leaves are remarkable.



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Romulea columnae* subsp. *grandiscapa. The flowers are purple with a yellow throat. We have only seen on Gran Canaria striking forms with the dark purple colour. The same as on the picture. It was amazing, to see them flowering in the grass, but only after noon, when the sun got warmer.

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The Botanic Garden of Las Palmas. It is easy to spend a day in this splendid garden. It is a huge and beautiful landscaped garden with different levels. Admission and parking are free. On the picture you see the *Dracaena draco* avenue. It is a native tree of the Canaries, but we did not see it in the wild.

The dunes of Maspalomas: It is not easy to write about Maspalomas and Playa del Ingles. Whether you like it or hate it, one thing is amazing: the dunes. Start your walk at the faro de Maspalomas (the lighthouse) and make your stroll of 6 km along the beach to the first buildings of Playa del Ingles. On the boulevard turn into the direction of the faro and you come at a viewpoint. From here you start an adventurous and heavy walk through the loose sand. You may have the illusion of being in the Sahara. To lose your way is impossible; always go in the direction of the lighthouse.



All photos taken by the author,
Gerrit Eijkelenboom.

This website may be useful:
<http://www.floradecanarias.com/>

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---Report from Utah---

Aloinopsis/Nananthus Hybrids in Utah: John Stireman.

John Stireman gardens in Sandy, Utah, U.S.A. Zone 5b-6a

I am the oldest of thirteen siblings, all of whom are avid gardeners. Our mother was a flower gardener with what little free time she had from raising her children. Three brothers besides myself have created rock gardens.



John Stireman's rock garden with mesembryanthemums.

Many years ago, I had become enamored of the endless forms within the great family, *Aizoaceae* (Mesembs), and grew many species from seed to include with cactus species in my greenhouse. I was pleased to find from the experience of others that one species of the Mesemb genus *Aloinopsis* was hardy even in my hot summer/cold winter garden. *Aloinopsis spathulata*, belongs to a group of genera of small, rough-leaved, rosette forming plants. It is the only pink flowered species within *Aloinopsis*, although some forms of *A. schooneesii* can be pink. All other *Aloinopsis* and similar *Nananthus* species have yellow to apricot flowers, often with a red central line to each petal.

By the time I had amassed a large number of mesemb species, I read an online forum post by Panayoti Kelaidis describing recent hybrids of *Aloinopsis* and *Nananthus* species. David Salman of High Country Gardens (Santa Fe, NM) had found a small yellow-flowered species of *Aloinopsis* during a visit to South Africa, now correctly identified by mesemb expert Steven Hammer as *Aloinopsis acuta* (not the *A. acuta* offered by Mesa Garden, Belen, New Mexico, which is a *Nananthus* sp.). David had produced hybrids between yellow-flowered *A. acuta* and *A. spathulata*

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and offered seed-grown plants under the name Karoo Red which were actually stunning, rich orange shades. Not long afterwards, Bill Adams of Sunscapes Rare Plant Nursery (Pueblo, CO) began offering a variety of named hybrid selections which included crosses of *Aloinopsis* with *Nananthus*.

David Salman supplied me with seeds of his *Aloinopsis acuta* and of *Nananthus* aff. *broomii* and I purchased the Bill Adams hybrids to add to my greenhouse collection. Soon, I was making crosses between every *Aloinopsis* and *Nananthus* species in the greenhouse including the named forms I had acquired. What makes it easy to cross these species is that, with few exceptions, the plants will not accept their own pollen. One can be reasonably confident that any seed obtained is of hybrid nature. Inter-generic crosses are successful within the group which includes *Deilanthe*, *Neohenricia* (night flowering), *Prepodesma*, *Rabiea*, and *Titanopsis*. I have also been successful with *Stomatium*, a night flowering mesemb genus in a different group, with resulting hybrids retaining the very narrow petals of this parent. The *Stomatium* hybrid flowers open late in the day.

I have ventured all of my species, clones and crosses in the open rock garden here in northern Utah where the minimum winter temperatures have been as low as -23°C but almost always occurring with some snow cover. Plants survive long periods beneath deep snow where the ground can be completely wet for weeks. Summers are hot and dry and I provide supplemental water. My soil is a fine sand with no silt or clay. Seedlings in pots and cell packs are wintered in cold frames. Among the *Aloinopsis* and *Nananthus* spp., only *A. spathulata* and *A. acuta* have proven completely hardy in the open. Almost all of the named selections and hybrids between *A. spathulata* (I call these ASX hybrids) and *A. acuta* and *A. schooneesii* and various *Nananthus* spp., hundreds of plants now, have been cold hardy in open garden. All ASX hybrids with genera *Stomatium* and *Titanopsis* have been hardy. Others are hardy in protected locations where the winter low does not fall below -18°C. Of the hardest crosses, plants in subsequent generations usually retain the same level of hardiness.

The result of all of my crosses is a wide range of flower colors from yellow to orange shades to cool and warm pinks, light and dark, and genuine, brilliant reds. There are bi-colors such as orange with violet centers and the reverse. Flowers on these mesembs last up to a week, opening in afternoon sunshine and closing tightly in the evening and on rainy days. Many mesemb species have flowers that open one shade and slowly age to another and the hybrids often do it to excess. Bill Adams once listed a selection he named 'High Noon' with flowers which opened pale yellow and aged to a light orange, the petals with violet tips. Crosses with this form retain the changing nature with some seedlings opening palest yellow and aging deepest maroon, a peculiar sight when a plant displays every shade at once. Seedlings from Bill's 'Thai Dyed' selection often open lemon yellow and age to deep orange. Second, third and fourth generations from any cross are yielding more colors and combinations. There were no pure yellows in the first ASX generations I created, but later generations gave me yellows that did not age to orange. A white flowered form of *A. spathulata* appeared among seedlings some years ago and I have since fixed the color such that crossing any white with another will always yield a white flowered plant. I have begun crossing white *Aloinopsis spathulata* with selected colors and less hardy crosses to improve hardiness and preserve unusual colors. Most recently, fine pastels have appeared. It is rare for a seedling not to produce a beautifully colored flower.

These are among the very easiest of plants to grow from seed. They will germinate readily from surface sown seed at room temperature (20°C) and grow well under fluorescent lights if provided a medium that is at least as much mineral grit as organic material. My current favorite soil mix is 4 parts pumice fines with 1 part sifted peat in 6 cm square pots. Over the surface, I place a single layer of pea-size gravel and sow the seed thinly. Growers must be careful not to sow too densely since germination is close to 100 percent. The soil should not dry completely until seedlings bear two pair of true leaves, at which time they can be allowed to dry out periodically. I usually allow about 25 seedlings per pot. The seedlings can be crowded if the pots are allowed to dry well between watering.

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They will simply stop growing at some point, waiting for the grower to pot them singly into gritty soil when time allows. I have kept crowded seed pots over a second year, potting the seedlings with complete success.

Seed is tiny and produced in abundance and it is viable for many years. Because these mesembs are easy to propagate from seed, a gardener can grow a great many, experimenting in a variety of garden conditions. They are also easy to propagate from cuttings. I have taken entire plants from the ground, cut off all of the rosettes and rooted them to multiply desirable forms. The thick caudex, re-potted, will sprout new rosettes. Seedlings and cuttings are best planted out in late spring.

Can anyone grow these plants? Most important is sunlight. These mesembs require direct sunlight for most of the day and throughout the growing year. Sunlight is also required to open flowers during cool spring days. Despite the fact that the native habitat of these species does not experience the very high summer temperatures they suffer here in Utah, heat is seldom a problem. A greater detriment will be very low temperatures in winter without snow cover. I would expect most plants to survive -18°C without protection. I have previously mentioned my sand soil. My brother Tony grows them in sandy soil over his clayey loam. A friend has great success in a mix of his natural silt soil amended with equal parts concrete grade sand and pea-size gravel. Winter wet does not appear to be a problem in such soils as long as temperatures are cold. Soils containing appreciable clay are not suitable. Soil and air begin to dry out in April here in Utah, though there can be wet periods like a recent wet April in which 13 cm. of rain fell. No problem for the mesembs. Roots are long and thick and plants would be well suited to conditions of a crevice rock garden using a sandy soil.

Given the ease of growing from seed or cuttings, rock gardeners with any interest should give these rewarding plants a try.



Aloinopsis acuta Seed for this species traces back to a collection made by [David Salman](#). It is smaller in parts than other *Aloinopsis* species.

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Having had a selective preference for the lighter shades of *Aloinopsis spathulata*, paler pink forms have appeared among seedlings over the years.



Aloinopsis spathulata

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ASX Hybrid pastel.



ASX Multi-Hued.

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Narrow petaled, deep magenta ASX Stomatium at center, rear.



Salmon Pink *Aloinopsis* hybrid.

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Aloinopsis hybrids - beautiful pastel hues in this hybrid.



Aloinopsis red hybrid

---International Rock Gardener---



The original Bill Adams' *Aloinopsis* hybrid 'High Noon' selection.



Aloinopsis hybrid ex 'High-Noon'

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ASX Hybrid rich colour.



Aloinopsis spathulata and hybrids grow well among mixed dry-land, sun loving plants.

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ASX hybrids alongside yellow *Delosperma basuticum*. Many hybrids mix well with a variety of other rock garden plants.



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Aloiopsis/Nananthus hybrid opens pink and ages to orange-red.



ASX – near red.

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This super-changing ASX hybrid opens lemon yellow, maturing to magenta-orange.



Bill Adams' 'Yellow Eye.'

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Some of Bill Adams' named selections.



Bill Adams' 'Last Light' selection.

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“Mesembs” (Mesembryanthemum) in a cold frame on a warm day.



Erigeron compositus to the fore.

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Radiant orange mesemb hybrid.



Pastel yellow mesemb hybrid.

---International Rock Gardener---



“Mesemb” hybrids preparing for winter.



Penstemons and mesembs, including *Pentemon arenicola*.

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An especially healthy hybrid in the garden of Tony Stireman.



Garden volunteers, *Aloinopsis spathulata* and *Lewisia nevadensis*.