THE ROCK GARDEN 145

July 2020

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The Rock Garden

The Journal of the
Scottish Rock Garden Club
July 2020

Number 145

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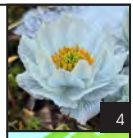

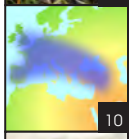

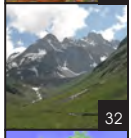

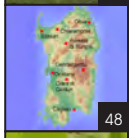

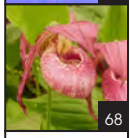

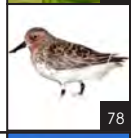

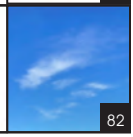

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The Editor welcomes articles, photographs and illustrations on any aspects of alpine and rock garden plants and their cultivation. Authors are encouraged to submit material electronically but articles may also be submitted in manuscript. Digital images are particularly welcome; high quality prints or drawings may also be submitted.

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A Letter from the Editor

2020 This is the year to forget that will never be forgotten. In Scotland we enjoyed a wonderful long warm spring that brought everything to perfection. Meanwhile, much of the normal structure of our lives was being altered beyond recognition and recall by the virus. Nevertheless, in the Scottish Rock Garden Club our passion for our plants remained and still endures; our love of flowers and form is undiminished.

Gardening Many of us garden for two reasons: to enjoy the moment; and to shape the future. For us there is immediate pleasure in working the ground, weeding the bed, shaping the rocks, pruning, standing with the sun on our backs. These instant pleasures are a prelude to the satisfactions of seeing the growth, glimpsing the buds and leaves, and admiring the outbursts of floral colour and shape. We plant for a future that is always hoped for and usually arrives – but is never guaranteed.

Tributes We enjoy the present and build an unclear future. *Carpe diem*! How better to deal with the new world of 2020 than to enjoy each day? This issue of *The Rock* Garden is a tribute to members and authors who did exactly that. They developed their stories for you and gave their help through an exceedingly difficult period. I pay tribute to the efforts of Wyke printers in Hull, who have supported us loyally throughout. I also acknowledge the kindly competence of Glassford Sprunt, who – in the face of the vicissitudes of aging – has conscientiously indexed each volume over the decades and has now retired from this exacting task.

This Issue The early Kendal show was held in the shadow of the advancing virus, but other shows, the summer event, the Discussion Weekend and Alpines21 have all been cancelled. With no show reports, this issue of your journal is slightly smaller than usual, although it contains the usual quantity of other articles for you to enjoy.

A Future Crisis – How can you help? We enter very different times. In recent years, many of our journals have been well stocked with travelogues and the search for exotic beauty. But foreign travel of all sorts will in future be difficult, constrained, expensive, and even dangerous. We therefore cannot expect the usual flow of travel accounts, and the supply of such material for your journals will inevitably dwindle. We face a future of smaller and perhaps less frequent issues *UNLESS* we all take up pen or keyboard.

Your Vital Role To strengthen the links between us, and to ensure the survival of this and our online journal, *The International Rock Gardener*, we must all contribute. Think about your plants, your experiences, your own gardens, your own enthusiasms. Please write, photograph, paint, draw and share with your fellow members. Some members doubt their own expertise or ability; but please don't doubt yourself – just write! All your contributions will be welcomed most warmly and will sustain our wonderful friendly community through this and our online journal.

Anton Edwards

Fred Forrest Hunt

It is sad to report the death of SRGC vice-president, Fred Hunt, who lived in Invergowrie near Dundee. Fred began his garden career as an exhibitor of chrysanthemums, switching to alpines under the tutelage of his next-door neighbours, Henry & Margaret Taylor. His name appeared regularly in lists of prize winners in the early 1980s and he was soon sweeping the boards with his immaculate plants. He was noted for magnificent presentation, with not a blemish on flower or leaf. He was aided both by his employment as a meticulous proof-reader and by his wife Alice. Fred was colour-blind; Alice's eagle eye was invaluable in helping him choose colour combinations and spot tiny flaws.

Fred was one of the first of modern exhibitors to feed plants regularly, ensuring that they were in superb condition – and larger than ever before. Medals, certificates and trophies abounded through his amazing career up to and beyond the end of the 20th century. He was a show judge, a member of the RHS Joint Rock Garden Plant Committee, member and sometime treasurer of the Angus Group. Fred and Alice welcomed many club members to their home, where excellent company was enjoyed with good food and the chance to marvel at the number and quality of plants in the garden, frames and alpine house.

He exhibited a remarkably wide range of plants, many obtaining RHS awards, including first class certificates for *Calluna vulgaris* 'Kinlochruel', *Clematis marmoraria*, *Edraianthus serpyllifolius* 'Major' and *Pleione* 'Shantung Ducat'. It is hardly possible to choose his best but he was renowned for European primulas, cypripediums and an imposing range of *Fritillaria* like *F. conica*, *F. crassifolia* and *F. tubiformis*. His trademark was the Chilean bulb, *Tecophilaea cycanocrocus*, shown to perfection, while his six- and three-pan entries were works of art. In the 1990s he travelled widely in China and Tibet in search of primulas

and rhododendrons. Indeed, Fred and Alice were fond of "getaway" holidays to lovely alpine places in Europe and even to the likes of Las Vegas. This was a somewhat unexpected destination for them, but they loved the glitz of the shows – so very different from the ones we have in the SRGC – but I bet the home baking wasn't as good!

Fred encouraged Ian and me after Harold Esslemont prodded us into showing and was never aloof or condescending to us. I remember our feeling of achievement the first time we beat his entry in a six-pan class - that was real success! He was the first to congratulate us. Fred was always neatly dressed. Not always most formally; sometimes at shows he wore an open shirt and cashmere sweater but he always looked immaculate. It amused us greatly to see photos of him emerging from a soggy trek tent in the Himalayas, looking "band-box smart".

As time went on, the Hunts were seen less often at shows and other club events they had supported so well. Alice died a few years ago and Fred, increasingly frail, entered a care home, where he died peacefully in his sleep, early in April 2020. After Alice died, their collection of flower paintings – many by the late Lawrence Greenwood – were donated for auction in aid of SRGC funds: a reminder of the kindness of one of our greatest ever exhibitors. By 2005, Fred was the SRGC's most successful winner of Forrest medals. His magnificent record was later overtaken by Cyril Lafong, for whom Fred had great affection and admiration.

In times of Covid-19 lockdown none of us could attend any public tribute to Fred Hunt but we retain for ever our affection and admiration and we mourn the loss of a good and generous friend.

Margaret Young

Fred's Plants

Appropriately, Fred Forrest Hunt's middle name prepared him for stardom in the world of rock garden plants. By 2005 he had won a Farrer medal and more Forrest medals than anyone. To choose just one of Fred's strengths: fritillaries were one of his passions and he had the skill and patience to increase one or two bulbs up into a world-class panful. His delightful Californian *Fritillaria liliacea*, very scarce or even rare in its native territory, the coastal hills from San Francisco Bay to Monterey, is amenable to cultivation and is cherished by top growers. It has blends of cream, pale green and yellow in the open bell-shaped flowers. It is a great pity that Reginald Farrer lived too soon to see Fred's plants, or he might never have written of fritillaries, *'the family all round has a bad character'*. Farrer lived long before Fred and died well before Wayne Roderick brought many delightful Californians into cultivation. Had Wayne seen how well *Fritillaria liliacea* grew for Fred he would have been delighted.

Sandy Leven

Trollius lilacinus Flowering at Tromsø

Ivar Johnsen

When living far to the North, with snow cover and winter half of the year, plants must be chosen with care. However, there are also advantages involved, for many plants favour the kind of climate we have up here. My own garden is situated in northern Norway on the large island of Kvaløya just west of the city of Tromsø and within the municipality of Tromsø. The garden is dominated by acidic peat deposits. This is a challenge, although genera like *Trollius, Ligularia, Dodecatheon* and *Meconopsis* perform very well without much management. Luckily, there are also some exposed rock outcrops in the garden, where saxifrages, gentians and primulas can find a home.

During many years I have collected species of *Trollius*, and most of them have been successfully established in the garden. The variation in flower colour is not very large; however, their diversity in size and flower shape makes them most attractive. Our own yellow Globeflower *Trollius europaeus*, very common in the wild and our county's symbol plant, contrasts strongly with the North American *Trollius laxus*, with its open flowers ranging from pale yellow to white. Several Asiatic species have very striking orange colours and semi-open flowers. When I discovered a number of years ago that there is a *Trollius* with mauve flowers, I became obsessed with getting hold of it. That was not a simple task, as it is not much available, although now and then Czech collectors come up with seeds from high up in Asiatic mountains. I managed to get hold of seeds five times. I sowed them during autumn and left them outside below the snow as a stratification. Sometimes they have germinated well, and even if they grow very slowly after germination, more than twenty plants have been produced and transferred into the garden after some years in pots. I have planted them out in a variety of garden habitats, from dry, gravelly soil to moist peatland-dominated habitats.

The distribution of *Trollius lilacinus* - in Tromsø it is living a long way from home

Arve Elvebakk took this in my garden ten days after the snow receded in Tromsø

The one illustrated above and on the previous page was sown in 2009 as seeds obtained from Josef Jurášek. It produced its first flower in 2015 and during the last days of April 2019 it produced four flowers, then on a ten-year old plant. It grows in dry gravel in a small depression of a rock outcrop, contrasting with its habitat in late snow beds in Central Asia, where it also can flower directly through the snow, like a crocus. This may be seen from the wonderful pictures included here and taken by the plant enthusiast Øystein Normann from our neighbouring town of Harstad. He took them in Kirgizstan exactly one month later than the start of flowering in my garden. I should add that 2019 had a late spring, and at the end of April most of the surrounding landscape here was snow-covered. There is apparently a very strong contrast between the plant's habitats in my garden habitat and in the wild. In reality, their ecological conditions may be rather similar: both places have long-lasting winter snow cover and the habitats are wet during snow melt, but then dry out. This happens in my garden thanks to its position on a rock outcrop, and in Kirgizstan because of the general dry continental climate, where even depressions become dry during summer.

I grow the plant like a bulb, and it flowers like one, quite as early as crocuses and *Saxifraga oppositifolia*, the first spring flower here. For some years I used to live further north in Finnmark and until last year had not seen it flower in my garden here. During this period, it was left to itself without any care, except I have noticed that the local elks have left some droppings close to it as an encouragement. I have lost the other small plants outside during their first year, but I have another plant in a much moister and peaty site. It is larger than the flowering one but has not yet shown any tendency to flower.

Trollius lilacinus growing in Kirgizstan (Photo: Øystein Normann)

Unlike a plant flowered by Viggo Ursfjord, another plant enthusiast a couple of hours drive south of Tromsø, my plant did not turn up mauve. You can see Viggo's amazing plant at '*Ursfjordalpines*' posted in 2013, and the same picture was used as an illustration in the recent Tian Shan flora by Holubec & Horák. He lost his plants to rodent attacks but has established new ones. Plants in the Tromsø Arctic-Alpine Botanic Garden were five years old in 2019 but have still not flowered. *Ornamental plants from Russia* writes that the plants may have up to twenty flowers when in cultivation, and that the plants flower during May in St. Petersburg, which is surprising – as it should be much earlier than in Tromsø. I have read in the SRGC Forum that people cannot grow it, and Olga Bondareva – gardening near Moscow – comments here that the species is impossible in gardens with a warm climate, although sterile plants can persist for up to two or three years.

I find the flowers of my plant absolutely amazing. They have a white to pale bluish colour, increasing a bit through their long flowering period which can be one month here. The same colours dominate in the wild population photographed by Øystein. On closer inspection it reveals transparent stripes, giving it a unique appearance, and the numerous flower parts make it look rather like a silky lotus flower far away from its home, although not so far away from the *Silk Road*.

In the scientific literature, the central narrow and erect deep-yellow structures that produce nectar basally – and are sometimes called staminoids – are the ones defined as petals. On the contrary, the large and showy ones are referred to as sepals, because no alternative greenish 'normal' sepals are present. Its taxonomy is also debated. To garden enthusiasts it is mostly known as *Hegemone lilacina*. Some mostly Russian botanists, joined by

Trollius lilacinus growing in Kirgizstan (Photo: Øystein Normann)

Chinese experts, have recently described a new species of *Trollius*, as well as reported on a previous Japanese species occurring in East Siberia. In their papers they included a most useful determination key to the genus, and several illustrations. *Trollius lilacinus* was excluded and obviously kept within *Hegemone*. However, both *Flora of China* and the recent Tian Shan flora treat it within *Trollius*. In *Flora of China* it is listed from 2600 to 3500 m in the Tian Shan and Altai mountains within several countries of Central Asia. The persistent sepals form a major key separating it from other *Trollius* species, in addition to its deviant flower colour. A Chinese molecular study from 2010 included eighteen species of *Trollius*, but not *lilacinus*, so one may have to be patient and wait for a future molecular study to have its generic affiliation settled. In the meantime, it can be reported confidently as well established in gardens in the Tromsø area, although it flowers much earlier than most other garden plants that visitors might want to come and see here, even before the midnight sun pops up around 20 May.

I thank Arve Elvebakk at Tromsø Arctic-Alpine Botanic Garden for help and literature, and Øystein Normann for his fine Kirgizstan pictures.

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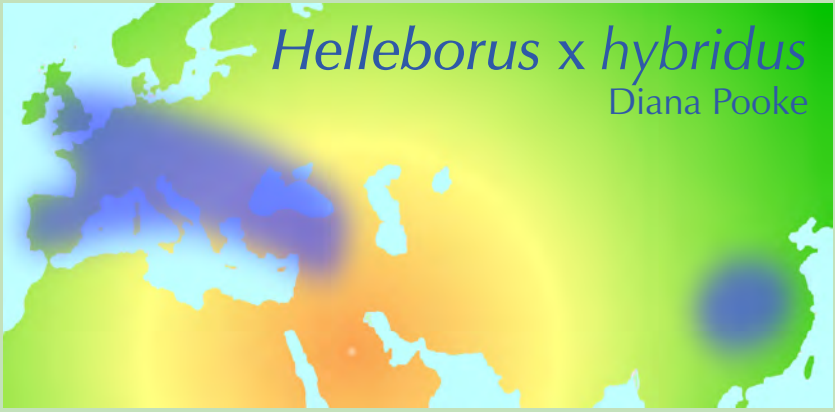


Helleborus x *hybridus*

Diana Pooke

Hellebores have been grown in gardens for a long time – originally for their medicinal properties. Along with most of the rest of the Buttercup (*Ranunculus*) family, they are full of alkaloid toxins and have been used as both a poison and a purgative. For example, during a war between the Amphictyonic League of Delphi and the City of Kirrha in the 5th century BC, the attackers discovered a secret water-pipe leading into the city and decided to poison the water with hellebore. This devious purgative soon rendered the defenders so weak with diarrhoea that they were unable to resist the assault, Kirrha was captured, and the entire population was slaughtered.

Hellebores are primarily European natives, many species growing in open meadows in Bosnia, Croatia, Slovenia, Turkey, Greece, Italy, but even further afield in China (*Helleborus thibetanus*). *Helleborus* x *hybridus* used to be commonly known as *Helleborus orientalis* – the Lenten Rose. However, these are actually complex hybrids involving crosses of various hellebore species.

Our current infatuation with hellebores really goes back to the 1980s when gardeners and plant breeders like Helen Ballard and Elizabeth Strangman in Britain started breeding them. Helen Ballard began crossing *Helleborus orientalis* with several other species including *H. odorus* (yellow*), H. purpurescens* (purple to gray) and *H. torquatus* (dark purple to black). Although Ballard strain plants are sometimes sold as cultivars of *H. orientalis*, they are largely garden hybrids which are more accurately described as *H.* x *hybridus* and are often sold by colour rather than descriptive cultivar name.

Helleborus x *hybridus* are evergreen, bushy, clump-forming perennials in the *Ranunculus* family and typically grow 25 to 45 cm tall with a similar or slightly larger spread. They flower from March through May and produce 2.5 to 5 cm wide long-lasting flowers, often along with daffodils

and tulips. Those with yellow genes are some of the earliest flowering. Five petal-like sepals surround a ring of small, yellowish-green tubular nectarines in an open bell shape. After the flower is pollinated, the petals and stamens fall off but the sepals remain on the plant for a month or two or more.

Mature plants often have fifty or more flowers. Hybrid hellebores (*H.* x *hybridus*) are mostly raised from seed but they may also be propagated by divisions or tissue culture. If a plant is divided, the offshoots will be similar but this is a slow and often expensive process. Smart gardeners wait to buy seed-raised *H.* x *hybridus* when they are in flower in the spring – then they can choose the flower form that they like. These seed-raised plants will in turn produce seed so that you are likely to find your mother plant surrounded in seedlings within a few years, with plenty of seed to enter in the ephemeral seed exchange. To ensure that you

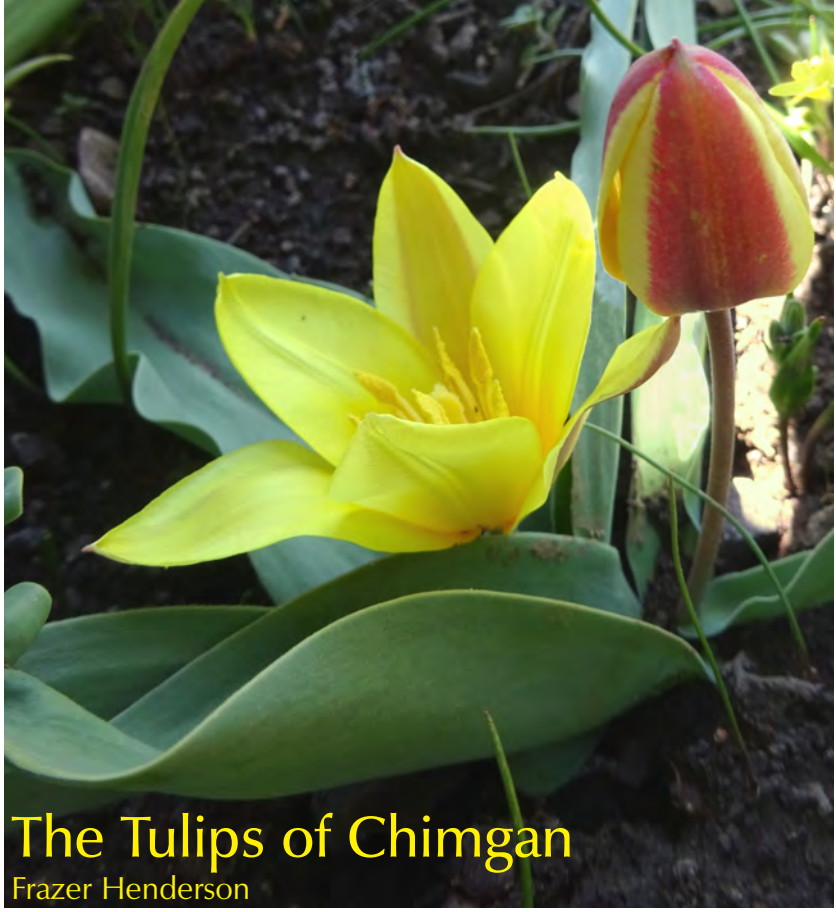
have a named variety – if that is what you want – it is best to plant modern tissue-raised plants, although hellebores raised by tissue culture tend to be sterile.

Hellebores are renowned for their tolerance of drought and neglect, although they truly thrive when grown in a moist and well-drained ground. Hellebores, although amenable to being moved in their root ball, resent being chopped into small pieces; if you want to divide them, chop them into two or three large chunks and replant or pot up immediately.

Hellebores are often found in the wild on alkaline soils, but they adapt easily to acid woodland conditions. They prefer a rich and highly organic soil, amended as needed with an organic fertilizer. Each plant of *Helleborus* x *hybridus* makes a 60 cm wide by 30 cm tall clump of thick evergreen hand-shaped leaves. In late winter, the 30 cm or more tall flower spikes emerge from the underground rhizome. For a better floral show, *Plant World* recommends waiting to remove the old foliage until just before the flowers emerge. The old leaves serve to protect the developing flower buds and keep them cool and delayed. If the foliage is removed too early in the season the developing buds may break too early and be susceptible to damage by late spring hard frosts.

Hellebore breeders are working not only on the colour and patterns of the blooms but also on the flower shape, some opting for cupped flowers, others leaning towards large, flat and open flowers. Some prefer up-facing flowers, while others go for the natural bell-like form where the colours are only seen on the back of the flowers. As time passes, there is an increasing number of double flowered and anemone-flowered forms being created where a second row of petals makes a collar inside the large calyx.

I am grateful to *Plant Delights* (see page 116, and www.plantdelights.com) for the provision of their many photographs of a small fraction of their wonderful hybrids.



The Tulips of Chimgan

Frazer Henderson

On a breezy mountain top in Chimgan, Uzbekistan, with the spring sunshine intensified by the reflective qualities of the snowfields, I caught my first sight of a squat and yellow-flowering tulip, its outer reverse tepals thumb-smudged with vermilion. A closer inspection of its sturdy triangular filaments, yellow anthers, yellow-green stigma and undulate leaves suggested it could only be an early-flowering *Tulipa dubia* – yet another species in my long-term quest to record in the field every tulip species in the Tien Shan range.

The Chimgan massif lies at the north-west extremity of the Tien Shan mountains, in the finger of the Chatkal range as it protrudes into the desert plains of Uzbekistan. Rising to 3309 m above sea level, this popular and accessible site, only 80 km from Tashkent, is famed for its concentration of mountain-woodland, sub-alpine and alpine plants. Indeed, between eight to nine hundred plant species, broadly representative of the wider Western Tien Shan flora, grow in the Chimgan area, including a number of rare, endemic and relict species, of which twenty-four are noted within the Uzbekistan Red Data Book.

Above: *Tulipa dubia*

Gagea vegeta

This illustrated short review is a conflation of two separate trips to the area: the first in the company of fellow members of the Wakefield & North of England Tulip Society, led by the Uzbek botanist Ivan Maltsev; the second a slightly later solo exploration.

Fessia puschkinioides

Tulipa bifloriformis in habitat
Korolkowia sewerzowii

Tulipa bifloriformis

The mountain tops, above 2000 m, are botanically rich both in the variety and quantity of plants. In view of the climate, geophytes are abundant. On Mount Kumbel (2200 m), which is easily accessible by a basic chair-lift and thus avoids an arduous scree climb, one may find a wide range of bulbous plants representative of the area and the altitude, including the *Gagea vegeta*, its slightly more upland and specialist cousin *Gagea filiformis*, and the well-known blue and white *Fessia* (or *Scilla*) *puschkinioides*. The tuberous *Corydalis ledebouriana* with its many varied hues of incarnadine, faded red and blushing pink threads its way through exposed rocks like torn sections of a tribal-inspired tapestry. On the snowmelt margins, numerous fine white-flowered, violet-striped *Crocus alatavicus* and many sunny *Colchicum luteum* stand to attention, their feet in recently sodden ground. *Tulipa bifloriformis* is

Tulipa bifloriformis life size

abundant on drier parts. Though the species is often documented as a white-flowered tulip with an egg-yolk centre, most of those observed in the upper reaches of the mountain were claret-coloured (presumably by anthocyanin) on both the inner and outer tepals. They were also – belying their given epithet – single rather than multi-flowered, as is, I found, predominantly the case in the lower hills.

Tulipa tschimganica variation - pointed tepals and orange colouration

Tulipa tschimganica - red with yellow eye internal colouration

Down in the main valley leading to Great Chimgan mountain (3300 m) wild plums, *Prunus divaricata*, were heavy with blossom. Glossy-green, tightly furled spathes of *Arum korolkowii* and the densely pubescent, lanceolate-leaved, chartreuse buttercup *Ranunculus paucidentatus* speckled the floor beneath the trees. Attractive yellow-flowering *Berberis oblonga* (syn. *heteropoda* var. *oblonga*) formed widely scattered thickets; in some parts of Uzbekistan this plant is used to stabilise shifting upland soil. On more exposed ground *Rheum maximowiczii* could be seen erupting from its long winter hibernation. I found numerous *Korolkowia* (=*Fritillaria*) *sewerzowii* on the valley moraines There is much conjecture as to whether this is a monotypic species or a full member of the *Fritillaria* family. A review of the literature provides little definitive clarification though, interestingly, authorities in Central Asia (and Russia), where the plant grows, tend towards *Korolkowia*. Whatever its status it is a fine plant that reaches, in the case of those measured in the valley, 46 cm in height with a maximum of twelve racemose and slightly flared flowers that ranged from yellow with a heavy dusting of cocoa to dark chocolate with all flowers showing the

Tulipa tschimganica - colour and tepal variation - red yellow form

characteristic bright yellow anthers. The reverse petals were dark brown to a striking deep magenta. Sturdy, lanceolate, glaucous leaves completed the picture of this attractive species. I am sure that it would prove to be a good garden plant in the temperate regions of Europe and North America.

The Chimgan valley, however, is famous for the endemic *Tulipa tschimganica*, a highly variable species (or sub-species of *T. kaufmanniana*, hybrid between *T. kaufmanniana* & *T. greigii*, or between *T. kaufmanniana* & *T. dubia*, depending on which authority one references). I must have inspected nearly two hundred individual plants while trying to find a degree of similarity in form and structure. Whilst flower colour varied from one plant to another with rarely two of an identical shade, it was noticeable that nearly all specimens possessed a dark ring on the filament – unlike *T. kaufmanniana* – which I rather hoped would be diagnostic. Indeed, on a subsequent review of the literature I noted that Tojibaev and Kadirov, in *The Tulips of Uzbekistan* (2010), promote *T. tschimganica* as a sub-species and advise that the filaments, unlike *T. kaufmanniana*, are *"yellow with a brownish tip."* Janis Ruksans,

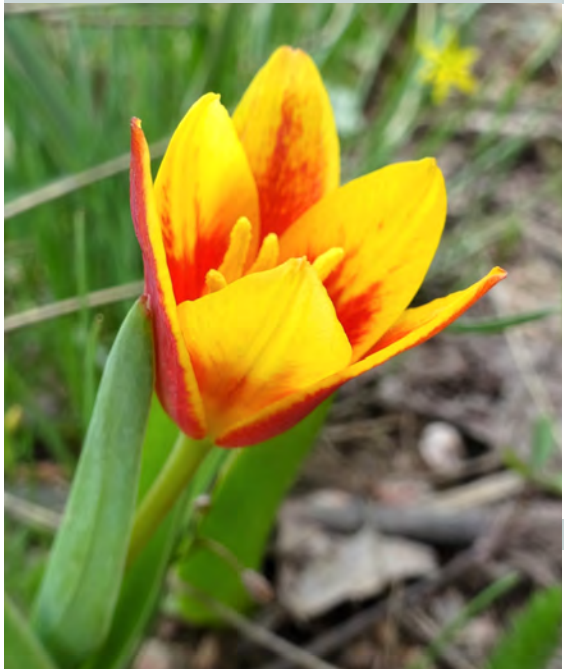
Below: *Tulipa kaufmanniana* in habitat

in *Buried Treasure* (2007), notes the "*characteristic brown ring on the yellow filaments*" and questions whether *T. tschimganica* is sufficiently distinct to constitute a species. Whatever its antecedents and whether it is a species, sub-species or a form it remains a plant of intrigue and beauty (in so many colours).

Thousands of *Tulipa bifloriformis* covered the valley bottom like bridal confetti. Some had up to eight fresh white and yellow flowers and, unlike those found in the higher mountains, the overwhelming majority lacked any hint of anthocyanin in the tepals; an observation worthy of further study.

The lingering snowfields were fringed with numerous *Colchicum luteum*, *Crocus alatavicus* (including aberrant specimens with up to eleven tepals) and *Gymnospermium albertii*, a Central Asian endemic of a small genus within the *Berberidaceae* family. Its rhubarb-red stems, glossy green and heavily divided leaves, with yellow and scarlet flowers in terminal racemes, certainly attract the eye. It would make an arresting exhibit at an alpine plant show. Intertwining drifts of *Pedicularis olgae*, *Astragalus pseudonobilis*, *Gagea gageoides* as well as *Corydalis darwasica* and *C. ledebouriana* produced a luxurious carpet enriching both the visual beauty and the botanical interest of the upper valley. On the valley shoulders, sheltered by occasional stands of *Juniperus seravschanica* and amongst heavily dissected *Ferula tenuisecta* and slightly more delicate *F. tschimganica*, I found a few wind-battered irises.

Pedicularis olgae



Superficially, they looked like *Iris orchioides* but on closer inspection none of them possessed the hairs on the ridge of the yellow falls that are usually noted with this *Scorpiris* iris. They also possessed white rather than yellow tepals. Accordingly, it did not seem to be beyond possibility that they were in fact *I. pseudocapnoides* or at least a localised

Tulipa tschimganica

Iris orchioides near Charvak

form of *I. orchiodes*. After a long walk through to the head of a neighbouring valley I saw another of the tulip family, *T. kaufmanniana*, on a southern flank. The literature advises that the flowers of this species may be found from cream to yellow through to orange and brick red. All specimens here were red. The slopes were dotted with variably shaped *Juniperus semiglobosa* and, where the ground was more open, I found the attractive *Rhinopetalum* (=*Fritillaria*) *stenanthera* both in flower and capsule. Most plants had one or two pinkish flowers with a magenta eye but up to seven

Rhinopetalum stenantherum

Onosma dichroantha

were seen in a sheltered rock fall. Though there is much conjecture as to whether *Rhinopetalum* is a full species or a section species within *Fritillaria* there can surely be no dispute about its intrinsic attractiveness.

Away from the alpine reaches the meadowed foothills rolling down to the shore of the Charvak reservoir continued to produce interesting plants, including *Lithospermum tschimganicum*, a perennial member of the borage family, and *Polygonatum sewerzowii* with its one metre sweeping arches of white pendulous flowers. The spires of the yellow legume *Thermopsis alterniflora* and the white and magenta flowered *Dictamnus angustifolius* punctuated the scrubby herbage of *Astragalus*

Eremurus robustus

A precarious bridge over the Chatkal River

Tulipa butkovii:
close-up of filaments, anther and ovary

pseudonobilis, *Bungea vesiculifera*, *Onosma gmelinii* and the red and yellow *O. dichroantha*. In other more open aspects the spear-like white foxtail lilies *Eremurus lactiflorus* reached skywards. Below them, yet another *Tulipa* species, the well-known *Tulipa greigii*; its scarlet goblet flowers sat atop erect stems with characteristic purple-blotched and wide lower leaves. A few irises were present and these certainly seemed to align with the description of *Iris orchioides* – having a slight beard and yellow falls. A bluff above the reservoir held a few early flowering *Paeonia hybrida*, their purple-pink inflorescences floating above heavily dissected leaves.

Charvak reservoir sits at the confluence of the Pskem, Koksu and Chatkal rivers and an exploration of the Chatkal valley proved profitable. After a two to three mile walk I spotted about sixty indistinguishable red

flowers high up on a steep scree slope, too far and too risky to investigate. Continuing the walk for a further half mile and rounding a bend I came across red flowered tulips beside the track. A detailed inspection followed and I was able to identify them as being *Tulipa butkovii*. This species, which is not abundant and has a restricted distribution, possesses distinctive, attractive and red filaments that are diagnostic.

Five tulip species and a notable sub-species (or hybrid) seemed not a bad return for an exploration of a relatively compact area. However, on retracing my steps from the Chatkal valley to where the river meets the reservoir, I saw a large red tulip within a platoon of *Eremurus robustus*. Could it be *T. vvedenskyi*, yet another species? It certainly possessed the flaring internal tepals, the large sized, blood-red flower cup, and characteristic violet stamens (twice as long as the filaments). However, the style and internal black markings suggested – despite the leaves lacking any form of blotching – a form of *T. greigii* particularly since *T. vvedenskyi*, though it has been recorded in the Tashkent viloyat (administrative region), is an Uzbekistan endemic more usually associated with the Fergana Valley. Its investigation proved, if proof were ever needed, that when tulip-hunting, exhilaration,

The hunt for *Tulipa greigii*

Rheum maximowiczii

frustration and disappointment are experiences that rarely stray from one another. Nevertheless, what is clear is that Chimgan is an accessible, botanically rich area that would satisfy anyone with a broad interest in all aspects of upland flora.

I am grateful to Dr Ivan Maltsev for his unsurpassed field identification skills and to Dr Nazgul Victorovna, Bishkek Academy of Science, Kyrgyzstan, for generously making available to me a number of botanical references for the Tien Shan flora.

A Trial on Tropaeolum Hardiness

Jean-Patrick Agier

Tropaeolum is a very interesting genus that comprises an array of various species originating from different areas of South America. The genus thus grows in a wide range of climates from subtropical to high Andean and through dry or wet atmospheres. Most species, including some of the few currently grown in Europe, are not hardy. But there are exceptions, and some that we might consider to be frost-sensitive may well prove hardier provided adequate growing conditions could be given. The well-known Andean species (*Tropaeolum polyphyllum*, *T. incisum* & *T. sessilifolium*) are considered hardy, so long as their tubers are dug deep enough in the ground to give winter protection. This incidentally provides cool conditions during the flowering season). In any case a sharply drained soil would be needed.

Tropaeolum speciosum and *T. ciliatum* spread by fleshy rhizomes underground and are also cold resistant, although sometimes considered to be invading weeds.

T. tuberosum ssp. *sylvestre* is also said to be hardy, equally propagating via fleshy rhizomes, but my experience with this species is very limited.

T. tuberosum and its subspecies and cultivars (var. *lineomaculatum* 'Ken Aslet' and ssp. *piliferum* being the most commonly grown) can also behave well though their aerial parts may be caught by frost. Nevertheless, the tubers withstand the coolest winter months underground if they are given good protection (a thick mulch would often do). Tubers of *T. tuberosum* ssp. *piliferum* grown in the Lyon Botanic Garden are regularly overwintered in this way – but some tubers are saved each year as a mere precaution.

Being tuberous, *T. pentaphyllum* is closely related to the Chilean species. It follows a Mediterranean growing cycle in Europe. It is certainly hardier than supposed and is well adapted to the south of France and to areas sharing similar weather conditions.

Trial Material

The current trial at Lyon has included several tuberous Chilean species (*Tropaeolum tricolor*, *T. azureum*, *T.* x *tenuirostre*, *T. hookerianum*, *T. austropurpureum* and some hybrids) along with *T. pentaphyllum*. Vary rare or delicate species such as *T. beuthii* or *T. rhomboideum* have not been included, for obvious reasons. Several seeds have also been sown directly without any protection in the same spot. Tubers spread new shoots over the ground in autumn and develop quite well and quickly if November and December are sunny and cool enough. But they haven't been overwatered. The main concern consists in how they would stand the winter months – which are often cold, variable and tricky from one year to another.

My Growing Conditions

I have sown seeds and dug all the tubers into a big container on a southwest exposed balcony protected by a 90 cm high concrete balustrade. This is an important detail to notice for it adds to wind and cold protection, implies less watering even during the summer months, and gives lower light levels in the first months of the year. One *Tropaeolum tricolor* tuber was planted directly at the Botanic Garden in Lyon last year among Mediterranean plants, in an open and well-drained spot partly protected from heavy rains. A trial of *T. pentaphyllum* is also planned for there in 2020. It is essential only to water sparingly even in summer to prevent the tubers from rotting; my tubers share the container soil with other plants such as *Clematis*, *Ipheion* and *Lilium*.

Trial Results

After three years trialing, I have some results to put forward:

- Down to -5°C, aerial parts of the plants survived
- Between -5°C and -8°C, aerial parts sometimes suffered but most tubers survived
- Under -8°C, the stems may freeze, and the blooming season be altered. The tubers might suffer without any protection: a thick mulch helps, or covering the whole plant with a double layer of horticultural fleece may save some of the aerial parts, although this is sometimes difficult to achieve
- Of course, this all depends on how long the cold temperatures last; very short cold spells are less damaging than long or repeated ones.
- *T. pentaphyllum* has robust tubers that have reliably sprouted each year for me
- *T. tricolor* and *T.* x *tenuirostre* also behaved and bloomed quite well
- *T. azureum* has been less vigorous and bloomed shyly
- I have no results with *T. hookerianum* and *T. austropurpureum*.

It's also interesting to notice that several young *Tropaeolum* seedlings have proven surprisingly cold resistant.

Non-Mediterranean readers may smile wryly at my advice, but every grower should bear in mind that planting *Tropaeolum* tubers in the open requires a well-drained soil, good exposure to light, and a spot protected from strong winds and heavy rains.

Conclusion

Nowadays concerns about climate change, with forecast cooler winter months in some regions and probably hotter summers, might allow us all – gardeners and *Tropaeolum* growers – to try these plants outside more often. Their Mediterranean growing cycle, involving summer dormancy, may increasingly match our European climate better than before.

So why not have a try?

"Welcome to Georgia"

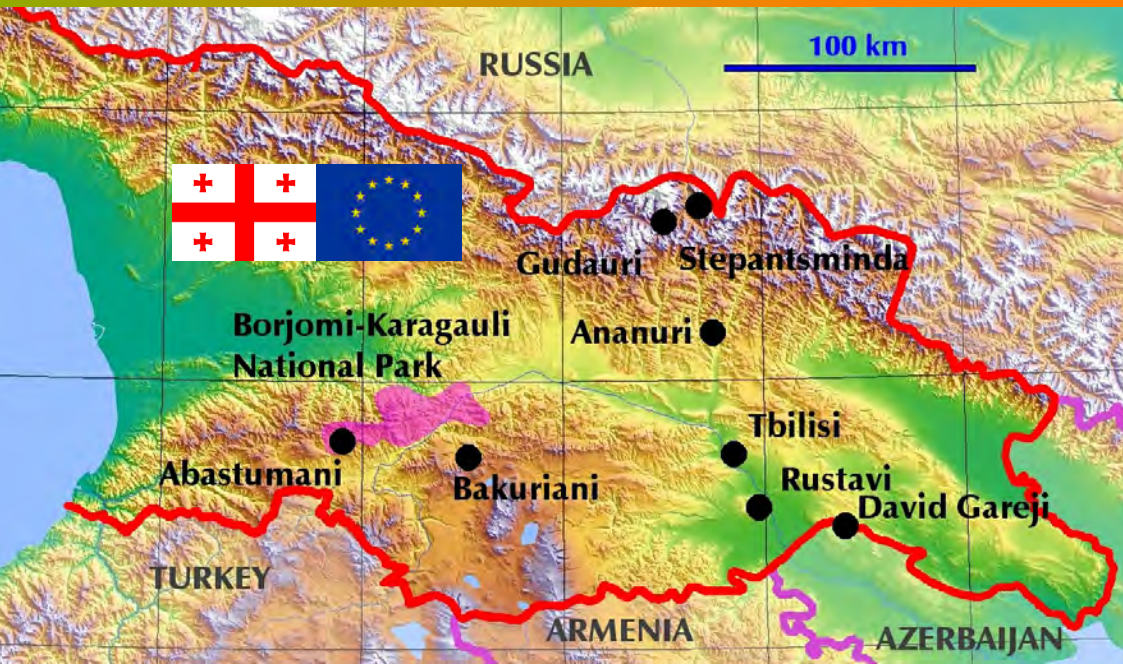
Russian and Georgian Caucasus
A Tale of Two Countries – 2: Georgia

David Livermore

We previously reported a trip to the Russian Caucasus in June 2016 (*The Rock Garden*, 143, 32). We now describe a second visit, covering the Greater and Lesser Caucasus of Georgia. As before, we booked a *Greentours* holiday, travelling to Tbilisi in May 2017. This was six weeks earlier than our Russian trip, and the season was also decidedly late that year, with lying snow plentiful on the higher passes. Consequently, the flora was mostly different to what we had seen before. Georgia is small and predominantly Christian, bordered in the North by the Islamic southern Russian provinces, to the West by Turkey, with Armenia and Azerbaijan to the South. It has been independent since 1991 after the fall of the Soviet Union, with whom it fought a bitter civil war in the 1990s, leading to breakaway republics in South Ossetia and Abkhazia. It is now peaceful, and proud of its associate European Union status, which came into force in 2016, one week after the UK voted to leave! The EU and Georgian flags fly on state buildings and schools in Tbilisi, and around the country. Our tour leaders were Shamil Shetekauri (late Professor of Botany at Tbilisi University, who, sadly, died a few months later) and Kurt Vickery (who had been with us in Russia). Shamil was assisted by his son, Tolkha, whose girlfriend (now his wife), Ana Kvlividze, joined us at weekends. Shamil and Martin Jacoby are authors of a field guide, *Mountain Flowers & Trees of Caucasia*. We had brought this with us, so Shamil kindly signed it, including a dedication in the attractive Georgian script. A S Zernov's *Field Guide to The Plants of the Russian Western Caucasus* was also useful, particularly in the northern part of the country. Clear pictures and Latin names compensate in part for the Cyrillic script of the main body of the text. A new book, *Illustrated Field Guide to the Flora of Georgia*, by Eberhard Fischer, Andreas Gröger & Wolfram Lobin, was published in 2018; at over 800 pages it is hardly a field guide but it focuses on Georgian species and includes location maps.

Our late afternoon flight from London to Tbilisi via Istanbul arrived at 03:30 (Georgian time is 3 hours ahead of Britain in Summer). Fortunately, the journey to our hotel was quite short, with very little traffic. After a few hours of sleep, we awoke refreshed and ready to start our exploration of the Georgian Caucasus. Firstly, we needed to visit a currency exchange kiosk to exchange US$ or European€ into enough Georgian Lari (around 3.3 to £) for our trip, as exchange facilities would not be available in the rural locations we were visiting. These small kiosks are to be found everywhere in Tbilisi, sometimes just a 'hole in the wall' – but with a person on the other side.

“ეწვიეთ საქართველოს”



Following a short visit to the supermarket we were on our way and found the right road out of Tbilisi at the second attempt. We were going to spend the day in the South. *En route*, we stopped near Rustavi to look for *Iris iberica*. Within minutes of leaving the minibus, strong winds and heavy rain were lashing down on us, so we beat a hasty retreat and continued southwards. The rain disappeared as quickly as it came, and it settled into a pleasant sunny morning. A bit further on, we stopped to admire some *Astragalus bungeanus*, *Achillea micrantha*, *Campanula hohenackeri*, *Scutellaria orientalis*, and *Allium gramineum*. Gopher Tortoises were also about, mostly hidden in the long grass, so we had to watch our step. Following a lunch stop in the shade of some trees, we travelled on through steppe towards David Gareja, a monastery complex right on the border with Azerbaijan. The surrounding area furnished some magnificent views of the plains below, with Griffon Vultures circling overhead as well as some interesting plants underfoot. Notable were *Salvia garedjii*, endemic to this region, *Colutea orientalis*, *Papaver argemone* and *Dictamnus caucasicus*. All too soon it was time to head back to our hotel in Tbilisi for the night. The journey passed uneventfully and soon many of the group were nodding off – a combination of the late bedtime the night before and some schnapps, which our driver, Valikho, had produced for our enjoyment.

Above right:
Snow in Jvari Pass

Left: *Salvia garedjii*
at David Gareja

Above: *Orchis simia*
at Ananuri

Below left:
Tragopodon reticulatus
near Turtle Lake

Below right:
Orchis pallens
near Bakuriani

Facing below:
Jvari Monastery

We were now going north towards Gudauri for a few days in the Greater Caucasus. Our first stop took us by surprise as our driver parked outside an amusement park on the outskirts of Tbilisi. Still mystified, we were led round the back of a pond (Turtle Lake) and through some woodland to a bank of grassland. We soon realised this patch was full of orchids – *Orchis pallens*, *O. morio*, *O. ustulata* and *Ophrys transhyrcana*. A lovely member of the Asteraceae family, *Tragopogon graminifolius*, and the umbellifer *Malabaila dasyantha* were also to be seen. Most of the bulbs had gone over but we found a few flowering stems of *Muscari szovitsianum*. All of this with the city of Tbilisi as backdrop. But it was soon time to move on, with a long journey ahead. Much of the time, we travelled on the Georgian Military Road, so-called because of its construction by Russian military personnel around two hundred years ago, but a route that has been used since antiquity. Progress was good on the tarmac road, with wonderful views of the surrounding countryside. We sped past abandoned greenhouses – a legacy of the Soviet era's planned economy, which designated Georgia as the region for growing cucumbers for the whole of the USSR. Lost subsidies and lost markets had rendered these businesses non-viable. We stopped for lunch by the lovely sixth century Jvari Monastery. Like many ecclesiastical buildings in Georgia, it is sited in a commanding hill-top position, dominating the landscape for miles around. Further on, we had a rewarding botanising stop near Ananuri, home to another fine church and many wonderful orchids. Here we found *Orchis simia* and the Frog Orchid, *Coeloglossum viride*, but the highlight was robust clumps of *Orchis caucasica* at the peak of their flowering.

We made our way up valleys created by the Aragvi River to the small and delightful family-run Gelas Guesthouse in Gudauri, nearly 2000 m above sea-level, with spectacular views of the surrounding countryside. This was to be our base for three nights. Next morning dawned with a thick mist over the mountain passes so we headed down into the Khada Valley, which was much clearer. The plants did not disappoint: there were good clumps of *Dentaria quinquefolia*, *Paris incompleta*, *Scilla armena* and *Corydalis angustifolia*. As we descended the valley, we came across a fine specimen of *Saxifraga pseudolaevis* in its very own crevice garden on the rock face! The morning mist had cleared off the mountains by now so, after a lunchtime picnic by the Aragvi River, we headed up to Cross Pass. This is a wonderful site for *Galanthus platyphyllus*, endemic to the Caucasus and one of our *must-see species*. It is described as a rare bulb

Corydalis angustifolia, Zekari Pass

and commands high prices in galanthophile circles. However, it was very abundant here, relishing the wet and almost boggy conditions fed by snowmelt in its growing season, followed by a summer baking – difficult conditions to replicate in a pot in Britain. So many were in bloom it was difficult to decide which to photograph. Scattered amongst them were a few *Fritillaria latifolia* in flower, but many more buds. We resolved to return to the site a few days later in the hope of seeing more.

It was a beautiful day with clear blue skies as we next set out to the Truso Gorge. Some high meadows were still covered in deep snow, but

Galanthus platyphyllus, Cross Pass

lower down we found good specimens of *Saxifraga juniperifolia*, *Primula darialica*, *Gentiana angulosa* and *Viola somchetica*. Further along the Terek River was the stunning purple *Pulsatilla violacea* that is endemic to the Caucasus. On the way back to our hotel, we visited Gudauri Lake. Here we saw *Potentilla crantzii*, *Scilla armena*, *Ornithogalum* aff. *schmalhausenii* and the yellow form of *Dactylorhiza flavescens*.

The next day we said goodbye to the lovely Gelas Guesthouse and made our way to our next base on the Greater Caucasus. We first explored the Darial Gorge and the Gveleti Valley. We followed the road adjacent to the Terek River up to the Russian border. Along the way, yellow *Primula macrocalyx*, cream *P. ruprechtii* and purple *P. amoena* were abundant, as well as *Orchis pinetorum* and *Pedicularis acmodonta*. Right on the border a dam was under construction, and appeared to have destroyed one of the known sites for *Fritillaria orientalis*. We did, however, see quite a lot of another target species, *Muscari pallens*, before we were moved on by the security personnel guarding the border. Continuing down the gorge and into the Gveleti Valley we were very pleased to find the rare *Physochlaina orientalis*, the most westerly species of this genus in the *Solanaceae* family, more commonly found in central Asia. We also finally located *Fritillaria orientalis*, high up on an inaccessible steep bank. We proceeded from here to Stepantsminda for the next couple of nights. Shamil had to leave us for university business back in Tbilisi, so his son, Tolkha, took over as second guide to the group.

Saxifraga pseudolaevis, Khada Valley

Previous Page - Some of the many plants that we found in the Truso Valley:
Primula darialica *Saxifraga juniperifolia*
Viola somchetica *Gentiana angulosa*

The following day we explored the Juta Valley using 4x4 transport. It was rather overcast so we headed straight up to the top in case the weather deteriorated. However, we couldn't resist stopping for some lovely specimens of *Puschkinia scilloides* and *Primula auriculata* in the damp, boggy conditions. At the top of the valley we were rewarded with some superb clumps of *Gentiana pyrenaica* along with *Colchicum szovitsii*. This species used to be in the genus *Merendera*, and is normally over at the time we were there, so it was a bonus to see them. We then made our way down, stopping for lunch by some rocks covered with *Draba bryoides*, *Saxifraga cartilaginea* and *Sempervivum caucasicum*, with *Daphne glomerata* and *Ajuga orientalis* nearby. We watched a couple of copulating butterflies for a short while before deciding it would be rude to stare, and left them to finish their endeavours undisturbed. After lunch, we descended the valley to the village of Sno for a short cultural stop to admire the small Orthodox church in the town centre, the King Vakhtang I Gorgasali monument, and the fortress. Our final stop of the day was in some woodland where we

Physochlaina orientalis (from Hill Farm Nurseries: www.hillfarmnursery.com)

Corydalis emanueli var. *pallidiflora*

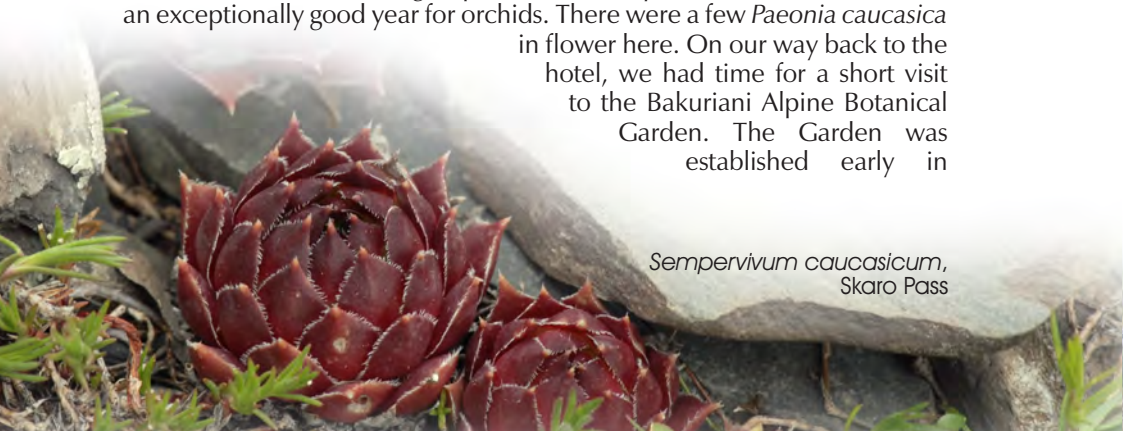
admired good numbers of *Corydalis emanueli* var. *pallidiflora*, *Primula cordifolia* and *Fritillaria collina*. The next day we drove 300 km almost back to Tbilisi before turning west towards Bakuriani in the Lesser Caucasus. We made a 'request stop' in Cross Pass to see the *Galanthus platyphyllus* again. In the days since our last visit they had "gone over" in the warm sunny weather. Our disappointment was short-lived because the *Fritillaria latifolia* that had been previously in bud were now in full flower, their purple bells contrasting with what was left of the white snowdrops. *Trollius patulus*, a member of the *Ranunculaceae*, also relished the boggy conditions and added a splash of yellow to the colour mix. We had to move on along the Military Road and then a new motorway, stopping for lunch at Igoeti. We hoped to see the fine-leaved peony, *Paeonia tenuifolia*, in the nearby woodland but could find none in flower, and just a few seed pods. In compensation, there were *Lonicera caprifolium*, *Verbascum phoeniceum* and *Lathyrus rotundifolius* to admire. Continuing to Bakuriani, we made a last stop to look at good specimens of *Orchis caucasica*. Just as we were leaving, we found some *Cephalanthera* species but we didn't have time to explore further, so decided to return on another day.

Puschkinia scilloides

Draba bryoides

Paeonia caucasica and habitat (Photo: Olga Bondareva)

We were to spend two days at the nearby Borjomi Kharagauli National Park. On a very overcast day we collected our passes from the well-appointed visitor centre, and visited lower elevations in the Kvabiskhevi River Valley. We soon found lots of interesting plants, including the last of the season's *Primula sibthorpii*, along with the local variant of the grape hyacinth, *Muscari sosnowskyi*. The upright deep-blue bugle, *Ajuga genevensis*, attracted lots of butterflies. We found lots of seed heads – but no flowers – of *Galanthus alpinus*. There were *Crassulaceae* everywhere, mostly *Sempervivum caucasicum* and *Sedum caucasicum*. After our picnic lunch by the Kvabiskhevi River, we resolved to go back to the orchid site we had found late on the day before. The helleborines were identified as *Cephalanthera caucasica* and *C. longifolia*. Besides *Orchis caucasica*, there was also *Orchis simia*, and one member of our group found *Orchis pinetorum*. It seems it was an exceptionally good year for orchids. There were a few *Paeonia caucasica* in flower here. On our way back to the hotel, we had time for a short visit to the Bakuriani Alpine Botanical Garden. The Garden was established early in

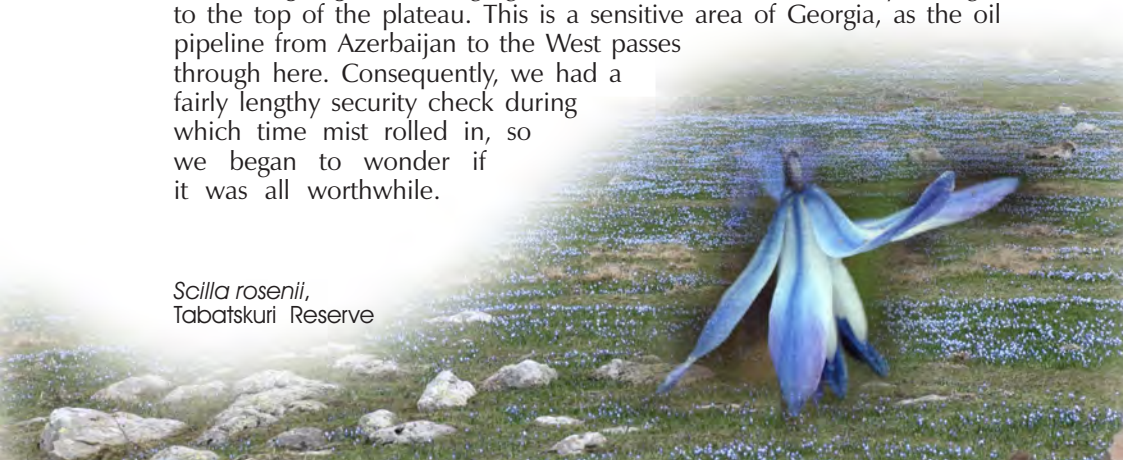


Sempervivum caucasicum, Skaro Pass

Anemone fasciculata, Tskhratskaro Pass

the 20th century and is administered by the Georgian Institute of Botany. Its primary functions are education and research into Caucasian plants, but visitors are welcome and admitted free of charge. A particular highlight was an extensive collection of peonies, including *Paeonia steveniana* and *P. wittmanniana*.

The next day dawned bright and sunny, so we headed up the Tskhratskaro Pass (2471 m) towards Tabatskuri. As we drove up the mountain, we paused to photograph some of the many hundreds of *Anemone fasciculata*, close to the road. Nearby we found *Dactylorhiza caucasica*. We stopped further up by a rocky promontory with good views of Bakuriani and the whole valley. Here there were plants of the lovely regionally endemic (NE Turkey and Georgia) pasqueflower, *Pulsatilla georgica*, with gorgeous mauve flowers. Eventually we got to the top of the plateau. This is a sensitive area of Georgia, as the oil pipeline from Azerbaijan to the West passes through here. Consequently, we had a fairly lengthy security check during which time mist rolled in, so we began to wonder if it was all worthwhile.



Scilla rosenii, Tabatskuri Reserve

Pulsatilla georgica, Tskhratskaro Pass

Fortunately, the fog cleared about the same time as our passports were eventually processed, and we could proceed. The wait was well worth it, as we were soon greeted with an astonishing site – hundreds of thousands of *Scilla rosenii* formed ribbons of pale blue near where the snow still lay. This is one of those views that once seen are never erased from the mind. Interspersed with the *Scilla* were the yellow flowers of at least three different species of *Gagea*, including *G. anisanthos*. Eventually we reluctantly boarded the bus to go to Tabatskuri Lake, where we had picnic lunch, taking time to photograph *Ornithogalum* aff. *schmalhausenii* and *Ajuga orientalis*. A short

Heracleum wilhelmsii, near Mtkvari River

Scutellaria sosnowskyi, Borjomi-Kharagauli

walk away we found some quite diminutive *Gentiana aquatica* hiding in the long grass. In the distance was the cone of an extinct volcano, Mount Tavkvetili. There was time for one more stop, to see *Galanthus alpinus* – this time in full flower, some *Primula cordifolia*, *Primula macrocalyx*, *Orchis pallens* and beautiful *Corydalis marschalliana* before we returned to the hotel, tired but very happy after a wonderful day.

The next day, we checked out of our hotel and returned to explore Borjomi-Kharagauli National Park some more. Our first stop yielded, amongst other things, *Coluteocarpus vesicaria* with its unusual papery husks protecting the seed heads, *Veronica liwanensis*, *Euphorbia pontica*, *Scutellaria sosnowskyi* and *Astragalus kozlovskyi*. Our orchid count increased with the discovery of bird's nest orchid, *Neottia nidus-avis*. We pulled off the main road close to the Mtkvari River for some stunning *Heracleum wilhelmsii*, with *Papaver fugax* nearby, before continuing to Abastumani. This is in western Georgia, close to the Turkish border and not far from the Black Sea. Our accommodation was an old Soviet-era observatory which had been built here in 1932 in an elevated position well away from atmospheric and light pollution. It is credited with several notable discoveries and still functions on a smaller scale as an observatory, but part of the accommodation is now hotel. An interesting artwork depicts our solar system planets as medals along with the associated ancient gods after which they are named. But we were there for plants, not planets, so next morning we headed on up the Zekari Pass, topping out at just shy of 2300 m. The road is no more than a rough dirt track, so 4x4 vehicles eased our ascent. The plan was to slowly work our way up the highest point, stopping whenever we saw anything interesting. The first stop was for some *Muscari sosnowskyi*, which we had seen before but not in such good numbers. Here we also found *Orchis pinetorum* and *Onosma caucasica*. A little further on we saw *Pedicularis wilhelmsiana*, *Dactylorhiza flavescens*, *Tragopogon reticulatus* and *Astragalus fragrans*. *Scilla caucasica* and *Primula auriculata* were the next plants to

Tricks of the changing light, or of taxonomic lumping with *Pulsatilla georgica: Pulsatilla albana*, Zekari Pass

tempt us, proliferating in the boggy ground near the path. By this time, the clouds, which had always been grey, had begun to turn ominously dark. We decided to get to the top as quickly as possible before the weather deteriorated. Thirty minutes later we were there, still dry, and with plenty of alpine treasures to see. We had all of ten minutes to do so, before a heavy hailstorm sent us running back to the shelter of the vehicles. A highlight was the cream pasqueflower, *Pulsatilla albana* – a consequence of the late season, as it would normally be over by mid-May. We also saw *Androsace albana*, and a *Gagea* species, possibly *G. taurica*. We waited for the hailstorm to pass, but as it didn't show much sign of doing so and the conditions were getting a little treacherous, we reluctantly decided it would be prudent to descend, giving us time to look at some sites we had already driven past. The weather brightened just in time for us to get out and look at a colony of *Fritillaria latifolia*, including some unusual yellow forms, and also *Dactylorhiza flavescens*. Further down, we saw some *Corydalis angustifolia* on a bank, and had just enough time to photograph them before the rains came back, so returned to the hotel to dry off, a disappointing end to a day that had promised much, but in which we had seen most of the target species, even though lacking time to linger. We were now almost at the end of our holiday, and next day we returned to Tbilisi. The roads were in very poor condition in the winter weather, so progress was very slow. We made a couple of stops to look at the narrow Georgian endemic, *Sambucus tigranii*, and the Foxtail Lily, *Eremurus spectabilis*. We travelled through the Georgian Lake District, stopping for lunch by the Paravani River. As we reached the outskirts of Tbilisi, an intense thunderstorm struck. This, with our late arrival, put paid to our thoughts of a final stop at Nichbisi, around ninety minutes away. Our trip had started with heavy rain and ended with a thunderstorm but in between we had some wonderful days, and it had left us with plenty to reflect on as we travelled to the airport in the small hours.

This concludes our two-part odyssey through the Caucasus. Nevertheless, there is still much to explore. It would be worth returning to Georgia later in the year and, further to the South, Armenia and Azerbaijan have much to offer …

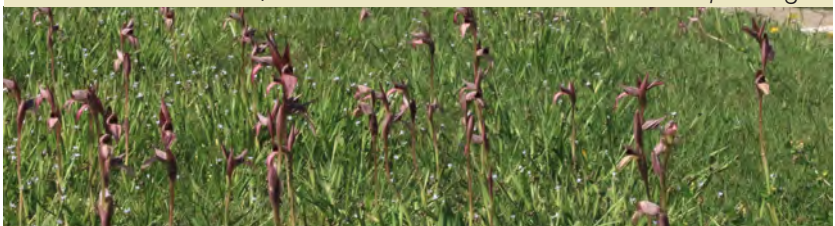
Astragalus kozlovskyi, Borjomi-Kharagauli

Sardinia

Michael J B Almond

Lynn and I decided to visit Sardinia because we knew that it had a wealth of fascinating archaeology and architecture and the various handbooks of Mediterranean flowers reported that it had a rich flora. Despite this last fact, there appears to have been nothing ever written about the island in the Journal of the SRGC, and nothing in the AGS Bulletin since the late Tom Norman's 1981 article on orchid hunting almost forty years ago (*Sardinia 1980* in QBAGS vol 49(3) no 205, 267-273). The only other articles we could find were Sheila Maule's *Holiday in Sardinia* in the American Rock Garden Society Bulletin vol 32(3) of July 1974 (pages 101-6) and less than a page in Lionel Bacon's *Mountain Flower Holidays in Europe* (1979). The island is omitted completely from Christopher North's *A Botanical Tour Round the Mediterranean*. Unfortunately, there is no illustrated handbook to the flora of Sardinia, although Antonia Pessei wrote an excellent and lavishly illustrated book on its orchids (*Orchidee in Sardegna*; Ilisso, Nuoro: 2017); this is definitely not a pocket-book and some of the specific names may offend British orchid buffs. Some of what the various Mediterranean flower handbooks say about the island appears to be inaccurate, as we discovered.

Above: Coddu Vecchiu, the Giant's Tomb *Serapias lingua*



Sardinia is part of the Republic of Italy and lies in the western Mediterranean, just south of Corsica (the two islands are separated by only about 11 km, or less than 7 miles, of sea) and well to the north-west of Sicily. The Italian mainland is about 180 km (110 miles) away. It is the second largest island in the Mediterranean, smaller than Sicily but larger than Cyprus, with an area of 24100 km^2 (9305 square miles). It is approximately 260 km (160 miles) long and averages about 100 km (60 miles) in width. It is well-wooded, with large areas of hill and upland, but also large areas of fertile plain. The highest mountain, Punta la Marmora, rises to 1834 m above sea level.

In 2018 we spent four weeks in Sardinia, two weeks in spring (from 21st April to 4th May) mainly in the north of the island and two weeks in autumn (from 8th to 21st September) mainly in the south. In the spring we stayed for one week just north of Sàssari, near the north coast, and one week at Oliena, just north of the Gennargentu, the main mountain massif of east-central Sardinia; in the autumn we stayed for two weeks at Torre Grande, on the west coast near Oristano. This account proceeds roughly from north to south.

On our first day in Sardinia, driving along the north coast from Olbia to Sàssari, we were already struck by the profusion of orchids. A

Cyclamen repandum (Inset: pale form)

Nuraghe se Tesoru: *Glebionis segetum*

roundabout we passed on the outskirts of Arzachena was carpeted with orchids: mainly *Serapias lingua* but also some *Anacamptis laxiflora*. To add variety, there was also *Urospermum dalechampii* and *Romulea columnae* (or possibly *R. ramiflora*). On the stones of the "giants' tomb" of Coddu Vecchiu we found *Umbilicus rupestris* (as we did later in numerous other archaeological sites) and nearby *Leopoldia comosa* and *Cistus monspeliensis*, the most common species of *Cistus* we saw on Sardinia. On the nearby Nuraghe la Prisgiona, in addition to more *Umbilicus*, there was the purple *Echium plantagineum*. In the oak woods surrounding the prehistoric village of Lu Brandali, near Santa Teresa Gallura, was *Euphorbia dendroides* and the first of innumerable sightings of *Cyclamen repandum*. Further west, Nuraghe se Tesoru (nuraghes, of which there are hundreds in Sardinia, are like Pictish brochs, only more so), near the aptly named "Elephant Rock", was surrounded by drifts of *Arum pictum* (in fruit in the spring) and the roadside verges were bright yellow with *Glebionis (Chrysanthemum) segetum*, *Malva sylvestris* and *Convolvulus althaeoides*. Further west, the low-lying littoral is fringed with sand dunes

Serapias cordigera

Serapias lingua

and the sand largely covered by coniferous woodland. Among the trees is a wealth of orchids: *Himantoglossum robertianum* (with flowers going or gone over but in greater numbers than we have ever seen elsewhere), *Gennaria diphylla* (again, mainly over, but in considerable numbers, despite its rarity), *Orchis anthropophora*, *Serapias parviflora* and various bee orchids (some of which were tentatively identified from Pessei's book as *Ophrys lutea* ssp. *corsica*, *O. subfusca* ssp. *liveranii* and *O. fusca* ssp. *funerea*). On the unwooded dunes and open areas in the woodland there are *Pancratium maritimum*, *Carpobrotus edulis*, *Lotus creticus*, *Echium plantagineum* and *Silene pendula*.

Gennaria diphylla

Further inland, east of Sàssari and near the village of Chiaramonte, we encountered some very impressive specimens of *Serapias cordigera* growing with *S. lingua*, *Anacamptis papilionacea* and *Lavandula stoechas*. Further east, as we climbed up towards Monte Limbara from the town of Tempio Pausania, the roadside verges and the woods became dotted with the flowers of *Cyclamen repandum*, mainly the usual bright red but occasionally a lighter pink. Here and there we also saw *Allium triquetrum* and *Viola hirta*. As we climbed higher up the mountain and the trees thinned out to reveal the granite skeleton of Monte Limbara, we encountered patches of *Crocus minimus* and *Narcissus tazetta*. At the top of the mountain (1362 m), in addition to a good crop of telecommunications antennae and the odd *Gagea* species, there were large numbers of *Crocus minimus* among the rocks, varying in colour from light mauve to deep purple and many with very attractive veining on their petals. South of Monte Limbara, along the road from Monti to Alà dei Sardi, in addition to fine displays of poppies (probably *Papaver orientale*), *Lavandula stoechas*, *Asphodelus albus* and *Cistus* (both *C. monspeliensis* and *C. albidus*) we also found more orchids: *Serapias cordigera*, *S. lingua* and *Anacamptis papilionacea*. Further to the West, the view from the road to the church of Sant'Antioco di Bisarcio was enlivened by a bright

Narcissus tazetta

Ophrys atrata

yellow carpet of *Glebionis segetum* in the field and, at the side of the road, there was *Allium roseum*, *Serapias parviflora* and *Ophrys tenthredinifera*.

After we had eventually tracked down the whereabouts of the Dolmen di Sa Coveccada (still impressive underneath its unsightly protective roof of metal sheeting supported by scaffolding), we paused as we drove back to towards the main road south of Mores. At the side of the road there was *Serapias lingua*, *Ophrys bombyliflora*, *O. tenthredinifera* and *O. atrata*. In rough scrub at the side of the road (but unfortunately protected by a non-negotiable fence) were numerous clumps of *Pancratium illyricum*. This is similar in many ways to its close relation *Pancratium maritimum* (the sea daffodil) but whereas *P. maritimum* is only found near the sea, usually on sand dunes, and flowers from summer through into autumn (so that in spring you only see the leaves and the large green seed heads with their black seeds), *P. illyricum* flowers in the spring and grows inland and mainly in rocky places in the hills and mountains. Do not believe the books (for example Grey-Wilson & Blamey's *Mediterranean Wild Flowers*) that tell you it grows "*generally close to the sea*". We saw it in many places, always well inland and often high up into the central mountains – not always in flower, as the strap-like leaves are very recognisable and easy to distinguish from other

Anacamptis papilionacea

Anacamptis longicornu

Ophrys exaltata ssp. *morisii* (perhaps)

plants once you have seen a clump in flower. It is described as having smaller flowers than *P. maritimum* and this is probably true, but not by much, and the size is variable; the flowers are certainly more delicate in appearance and, as far as we are concerned, *P. illyricum* is a more attractive plant than *P. maritimum*, attractive though the latter undoubtedly is. Further along the road south of Mores we came across a stretch of roadside verge covered with *Anacamptis papilionacea* growing with (and possibly hybridising with) *A. longicornu*. There was also more *Serapias lingua* and *Ophrys tenthredinifera*.

A little further south is a large wooded upland area known as the Foresta di Burgos. We found this to be a very fruitful area for plant hunting. Alongside the approach road from Bonorva to the west we found masses of *Anacamptis papilionacea*, varying considerably in shape and colouration, along with *Ophrys tenthredinifera*. In the forest we found *Lupinus angustifolius*, *Anemone palmata*, *Ornithogalum* species and lots of different orchids: *Anacamptis papilionacea*, *A. longicornu* in various shades from dark purple to almost white, *Himantoglossum robertianum*, *Dactylorhiza insularis*, *Orchis provincialis*, and various Bee Orchids (identified as *Ophrys tenthredinifera*, *O. exaltata* ssp. *morisii*, *O. atrata*, *O. iricolor* and possible hybrids). On one roadside verge we found dozens of magnificent specimens of *Pancratium illyricum* and in many places the woodland floor was carpeted with the red flowers of *Cyclamen repandum* as far as the eye could see. One particular location, however, must take pride of place: quite a small patch of open woodland beside the main road, fairly well fenced off with, in addition to the pink of the

Anacamptis papilionacea forms

cyclamen round its edges, the even brighter pink of scores of big peony flowers. Most books consider the peonies of Sardinia to be *Paeonia mascula* or one of its subspecies. The Italians, however, consider them to belong to a separate species, *P. morisii*. The petals are generally a quite light pink in colour and often fairly mottled. The peonies in this population in the Foresta di Burgos, however, are of a uniform bright, fairly deep pink and they have been named in 2015 as a separate species, *P. sandrae* f. *camarda**. They certainly look different from the peonies we saw in other areas of Sardinia. This location is near the top of a ridge and, in the autumn, we located another site for the same species a few kilometres to the north on the same ridge; of course, the plant was in seed, not in flower, but the seed heads are very attractive in themselves, with their shiny black fertilised seeds and bright red unfertilised seeds. In flower alongside the seed heads were *Scilla autumnalis* and the orchid *Spiranthes spiralis*. We failed to find seed heads of the peony at the *locus classicus* but were compensated with a small colchicum, probably *C. corsicum*. At its eastern end the Foresta di Burgos rises to the b'Uccaidu Pass (1045 m). The woods immediately below it were, as usual, carpeted with *Cyclamen repandum* and in the open turf there were species of *Gagea*, *Ornithogalum* and what was probably a dwarf *Anacamptis papilionacea*. On the bare rocks at the top of the pass were large mats of a small white flower, probably *Soleirolia* (*Helxine*) *soleirolii*.

Considerably further east, to the north-east of Nuoro and lying SW-NE, is a limestone ridge about 20 km long, cresting at about 1000 m between its two highest points of just over 1100 m. This is Monte Albo

Paeonia sandrae seeds and flowers

and there is a road all the way along its north-western side at a height of 600-700 m. The road has mainly woodland immediately above it, with patches of open scrub and scree. In the woodland, beneath *Cistus albidus*, we found *Cytinus ruber* just about to come into flower and beside the road there was the usual *Cyclamen repandum*, including a few with light pink flowers. There were also a few clumps of *Pancratium illyricum*, the attractive yellow *Melilotus messanensis* and some orchids: a helleborine not yet in flower, *Orchis anthropophora* and *Ophrys iricolor*. On the scrub-covered scree and the rocky outcrops above the woodland there were some *Cerastium tomentosum*, more *Cyclamen repandum*, a lot more *Pancratium illyricum* and a good number of scattered clumps of peony, most of which was past flowering; the few flowers left showed the characteristic mottled pale pink of *Paeonia morisii* – so different from the colouration of the *P. sandrae* we had seen previously. Further on, where there is no woodland above the road but only scrubby scree, there were a number of orchids at the roadside: *Orchis anthropophora*, *O. mascula* ssp. *ichnusae*, *Anacamptis longicornu*, *Ophrys speculum*, *O. holoserica* ssp. *chestermanii* and *O. fusca* (ssp. *ortuabis*? and variants).

The Gennargentu range, south of Oliena, is mainly limestone; there is spectacular scenery, but communications are difficult. South of Dorgali the road winds up under towering cliffs, with dramatic views to the gorge

Paeonia morisii

Ophrys holoserica ssp. *chestermanii*
Ophrys speculum

Gola su Gorruppu, until it comes up to the Genna Silana pass at 1017 m. Under the trees beside the road on the way up we found *Cytinus ruber* just coming into flower, and *Cyclamen repandum*. On the open rocky hillside above Genna Silana and under the scattered trees, we found more *C. repandum*, *Euphorbia characias*, a sizable number of clumps of *Pancratium illyricum* and a large number of substantial plants of *Paeonia morisii*, many in full flower and others either just gone over or with their flowers destroyed by the violent storm of the previous day. Further along the road, above Urzulei, we found another, very steep scree and cliff with even more *Pancratium illyricum*. In the little valley below, *Helleborus corsicus* was flowering alongside the stream.

Further west, the ski area of Bruncu Spina is reached by driving south from Nuoro, through the little town of Fonni. The roadside verges and the woodland to the side of the road north of Fonni were carpeted with *Cyclamen repandum*, interspersed with a good number of orchids: *Orchis provincialis*, *Dactylorhiza insularis*, *Ophrys tenthredinifera* and, in one place, *Neotinea maculata*. From Fonni we made a detour to the Passo di Caravai, above the tunnel which takes the main road south from Nuoro to Lanusei under the watershed. *Cyclamen repandum*, *Orchis provincialis* and *Dactylorhiza insularis* continued in profusion and were joined by a pink orchid (possibly a pale *Anacamptis laxiflora* or a hybrid), *Anacamptis longicornu*, *A. papilionacea*, *Orchis mascula* ssp. *ichnusae* and some small saxifrages growing in the turf (possibly

Orchis anthropophora

Orchis mascula ssp. *ichnusae*

Saxifraga bulbifera). On an open hillside above the road we found scores of large plants of *Paeonia morisii*, mostly in flower: a wonderful sight with a view of the pass behind them. Continuing from Fonni up towards Bruncu Spina, at first we met even more of the cyclamen, *Orchis provincialis*, *Anacamptis longicornu* and *Dactylorhiza insularis* at the roadside, with the addition of an interesting bee orchid (possibly *Ophrys passionis* ssp. *garganica*). When we turned off the main road, on to the road to Bruncu Spina, we climbed up and drove across open hillside littered with the remains of the last season's bracken. The ground was bright yellow with *Dactylorhiza insularis*, interspersed with *Anacamptis longicornu* varying in colour from the usual dark purple through pale lilac to white. Beside the road we also saw an *Ornithogalus* species, *Viola hirta*, and a solitary *Neotinea lactea*. The road to Bruncu Spina ends at a car park at

Crocus minimus at Bruncu Spina

about 1500 m, from which there is an easy track up on to the top of the ridge at about 1700 m. Just above the car park, the steep hillside was purple with *Crocus minimus* – a magnificent sight – and, as we walked up the track we saw a lot of the local endemic mountain pansy, *Viola corsica* ssp. *limbaraei*, varying in colour from deep purple through violet to pure white, and also *Gagea* (possibly *G. liotardii*) and large patches of *Ornithogalum* (possibly *O. collinum*). At the top of the ridge, below the melting snow, the hillside was once again purple with *Crocus minimus*.

From this point on, we leave the spring behind and everything will refer to our autumn visit and what we saw then. Some 50 km from the Gennargentu in the more fertile western part of the island, on the main north-south highway between

Tamuli: female baetyls

Ophrys tenthredinifera

Sàssari and Càgliari, lies Macomer. Overlooking the town from the northwest is the Nuraghe Santa Barbara. Along the path to it from the main road there was a surprising number of flowers out in September: the dreaded *Smilax aspera*, with its fish-hook-like barbs, both in flower and in fruit, *Calystegia soldanella*, *Cichorium spinosum* and *Erodium cicutarium*. Across the valley and on the other side of the main road from the Nuraghe Santa Barbara is the prehistoric cemetery of Filigosa. Here, in the grass beside the path, we had our first sighting of the delicate *Narcissus miniatus*. A few kilometres further west is the prehistoric complex of Tamuli, with nuraghe (giants' tombs), and the famous female baetyls (sacred stones with certain apparently female characteristics). Beside the car park we found several spikes of the orchid *Spiranthes spiralis* in flower and elsewhere on the site there was *Urginea maritima*, *Verbascum sinuatum*, some very impressive flower heads of *Daucus carota*, *Ecballium elaterium*, *Calystegia soldanella* and what appeared to be *Echium plantagineum* still in flower. Below the nuraghe there were extensive clumps of *Arum pictum*, many in flower and what may have been *Euphorbia pithyusa* – a handsome bush but not in flower. A little further south, at the nuraghe of Imbertighe near Borore, we made our only sighting of *Sternbergia lutea*; with its bright yellow flowers, it is difficult to miss but we did not see it anywhere else. Here too were patches of the squirting cucumber, *Ecballium elaterium*, which we encountered in several other places. Further south, beside the road north of Fordongianus (an ancient spa which, like Bath, still has its hot springs active and running through the Roman remains) the roadside verges and the wet scrubland at the side of the road were covered in sheets of white *Acis autumnalis* – a magnificent and quite unexpected sight, as

Spiranthes spiralis

Michael J B Almond

Sternbergia lutea

the whole area had been devoid of flowers less than a week earlier. In various places, in scrub and on verges, we also saw *Scilla autumnalis*, *Convolvulus arvensis* and *Calystegia soldanella*. On the coastal sand dunes of the west coast, north of the Gulf of Oristano and down the Sinis peninsula, the Sea Daffodil, *Pancratium maritimum*, was common and still in full flower. Towards the end of the peninsula, beyond the dunes and in the archaeological site of Tharros, we also saw Rock Samphire (*Crithmum maritimum*), the Golden Samphire (*Limbarda crithmoides*) the Yellow-horned Poppy (*Glaucium flavum*) and many bushes with small violet-coloured flowers (possibly *Limonium articulatum*).

About 60 km north of Càgliari and remote from both east and west coasts, is an area of upland heath, a more or less flat-topped basalt tableland with an altitude of about 600 m, known as the Giara di Gèsturi. The vegetation on the top is a mixture of impenetrable cork oak (*Quercus*

Calystegia soldanella

Convolvulus arvensis

suber) thickets and open spaces, with some shallow lakes and occasional wet flushes, but no flowing water. It is home to the famous wild Giara horses, several of which we managed to watch as they grazed beside one of the seasonal lakes which still contained water. There were a number of interesting flowers in evidence: *Spiranthes spiralis*, *Narcissus miniatus*, *Scilla autumnalis*, *Allium paniculatum*, *Centaurium erythraea* (which, *pace* the handbooks of Mediterranean flora, is reliably attested to flower on into September) and *Thymelaea tartonraira* bushes with both flowers and fruit. Beside one of the springs which feed the lakes, we found a yellow potentilla (probably *Potentilla reptans* which also flowers into September), the white *Ranunculus aquatilis* (which the horses like to eat) and an attractive and impressively spiny plant with a golf-ball sized head of small, white, four-petalled flowers. Some of the Strawberry Trees (*Arbutus unedo*) were also in flower, and we were fascinated to observe

Scilla autumnalis

Centaurium erythraea

Narcissus miniatus

Thymelaea tartonraira

the labours of the many dung beetles at work on the horses' droppings. Southeast of the Giara, near the village of Goni, is the archaeological site of Pranu Muteddu, with its rows of standing stones and elaborate rock tombs. Here under the edge of the open woodland of cork oaks surrounding the site, in addition to *Scilla autumnalis*, we found the largest number of the orchid *Spiranthes spiralis* that we have ever seen. We have usually seen it in penny numbers but here there were hundreds. As so often, provided the sites are not maintained too tidily, archaeology and plant hunting go very nicely together.

Having described what we *did* see on our travels though Sardinia I should like to finish by mentioning one plant we *did not* see, although we expected to. At no point, either in the spring or in the autumn, did we see any sign of *Cyclamen hederifolium*. Although, obviously, we did not cover the whole of this very big island, we did travel through many varied habitats, some of which appeared ideally suited to *C. hederifolium*. If there had been flowers in the autumn, we surely would have seen them; if we had encountered leaves in the spring, it is unlikely we would have missed them. We know that it grows in southern Corsica, as we have seen it there flowering abundantly; but we found no sign of *C. hederifolium* on Sardinia, and we came to the conclusion that it probably did not grow there, despite the fact that all the guides to the flora of the western Mediterranean area that we have seen (and the monographs on the genus *Cyclamen*) state that it *does* grow there. Since returning home, we have sought advice from Vic Aspland (President of the Cyclamen Society) and consulted the relevant volumes in Moris's *Flora Sardoa* (1837-59) and Pier Virgilio Arrigoni's recently published (2010-15) six-volume *Flora dell'Isola di Sardegna*. Moris (vol 3, p 22) lists only one species of cyclamen, his *Cyclamen vernum*, which subsumes both *C. repandum*

Pancratium maritimum on the Sinis peninsula

and *C. hederaefolium* (as he spells it). This confusion continues even today, as can be seen by searching on the internet for photographs of *Cyclamen hederifolium* in the wild in Sardinia: what comes up are photographs of *C. repandum*! The most authoritative website (http://luirig.altervista.org/flora/taxa/regioni.php?regione=20&famiglia=Primulaceae&genere=Cyclamen) that I have identified dealing with Italian flora categorises *C. hederifolium* in Sardinia as of "doubtful presence". Arrigoni (vol 2, p 564) states that, subsequent to Moris, *C. hederifolium* was reported on the island by the botanists Barbey (1884), Cavara (1901) and Falqui (1907); it is not clear whether these reports were based on first-hand evidence or if they were simply following Moris. Arrigoni himself knows of two recent reports of its growing on Sardinia, one published in 1995 and one personal communication (both in areas we did not visit in the autumn and in vaguely described

Pancratium illyricum in the Foresta di Burgos

Arum pictum

locations which we probably did not visit in the spring). He considers it to be present but very rare. Vic Aspland has given me a location from an Italian contact who tells him it grows in an area that, most frustratingly, we passed within a couple of miles in September but did not explore. Of course, if we had known that it was rare and difficult to find (unlike Corsica and Puglia) we would have sought information and advice in advance. In my opinion, it is misleading for the books simply to state that *C. hederifolium* occurs on Sardinia without saying that its frequency there lies somewhere between rare and non-existent. It is possible. of course, that the authors of the handbooks (and the monographs) have

Sardinia

not actually been to Sardinia and, in this case and in that of *Pancratium illyricum* mentioned above, they are simply relaying hearsay evidence from unchecked sources. If this is the case, one is entitled to ask: what else is there in these handbooks that is misleading or simply not true? Perhaps the authors should make clearer those areas of which they have first-hand knowledge.

Colchicum corsicum

Cypripedium Care

Shawn Hillis

The distinctive flowers of *Cypripedium* and other Lady's Slipper Orchids are marked by the inflated slipper or shoe-shaped lip. The name *Cypripedium* is derived from Kypris, the Greek goddess of love and beauty, the Latin word *pedis* meaning *foot* and the Greek *ΠΕΔΙΛΟΝ* meaning *slipper*. There are about fifty-eight species worldwide, thirteen in North America. Cypripediums have had a long-standing reputation for being fussy – if not impossible – to cultivate. The first *Cypripedium* was described in the mid sixteenth century, so we are talking about a long time. It has only been in the last thirty years that the secrets of germination and techniques for cultivation have evolved to the point that these plants could be offered commercially.

With close to two hundred hybrids, and increasing, now is the best time to get growing. Currently, three clones have been trademarked and still more are to come. Species from China, Europe and North America have been hybridized to give the adventurous gardener endless options of different colours, shapes and sizes. Growers may even extend their flowering season by growing late-flowering species like *C. kentuckiense*, *C. reginae*, and the hybrids that they produce.

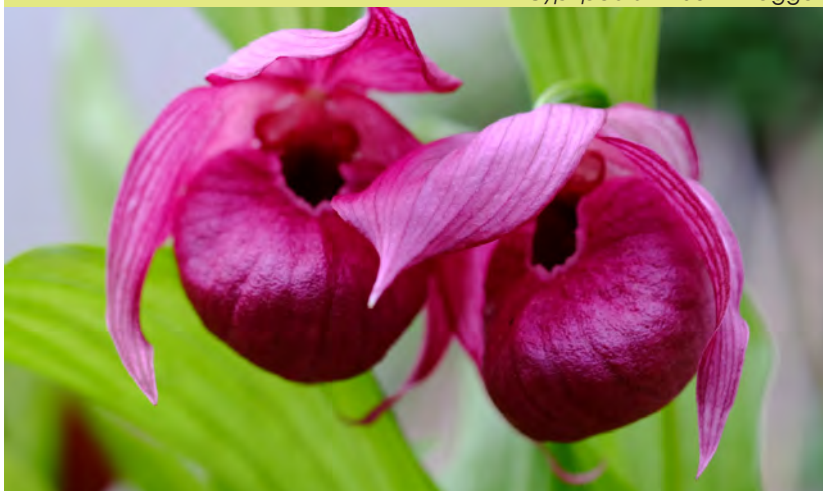
Cypripedium 'Peter' Above: *C. parviflorum* var. *pubescens*

Cypripedium 'Frosch's Mountain King'

There are four named varieties of *C. parviflorum*. They include a large form *C. parviflorum* var. *pubescens* and a small form *C. parviflorum* var. *parviflorum*. Both have been used extensively by breeders because of their clumping habit and hardy vigour. *C. parviflorum* produces outstanding hybrids that are highly recommended as starter plants.

A few simple cultural practices can greatly increase your success rate. First and maybe one of the most important things you can do as a grower is never to transplant while the plants are actively growing. Always plant out when dormant. I guarantee this simple suggestion will save you money and a lot of frustration. Live transplanting is common in the garden nursery trade but for cypripediums is one of the biggest contributors to an already sordid and misunderstood legacy. If the temptation is too great and you take a flowering plant home, always plunge the pot into the garden. Just dig a hole and sink the pot, doing the actual transplant in the fall. It takes even mature flowering-sized plants about three years of being planted in the garden to really hit full stride.

Cypripedium 'John Haggar'



Cypripedium 'Monto'

Most cypripediums are woodland plants and prefer cool sites that do not become too hot and dry in the summer: semi-shade, no direct midday summer sun. A suitable place would be on the north side of a structure or tree. Avoid planting near or under large trees and shrubs; fast growing large perennials will smother naturally slow-growing cypripediums, which will thrive in a shade bed with smaller slower growing ferns and shade-loving perennials.

Cypripedium 'Kentucky Pink'

Cypripedium 'Paul'

Cypripediums require a well aerated and free draining soil ideally in non-compacted healthy garden soil with good structure. Do not add manure or use manure-based compost. Compost should not be used as a replacement for a good bark mulch ground cover. Mulching in the spring helps maintain moisture as well as keeping the roots cool throughout the summer. Mulch also helps regulate temperature fluctuations throughout the winter months. Good mulch consists of wood

Cypripedium 'Multi-White' (Jaques Amand International, Joint Rock, 2013)

Cypripedium 'Kentucky Maxi' (shown by Richard Green)
Cypripedium 'Sebastian' (shown by Cyril Lafong)

chips of varying sizes, leaves and conifer needles. A good mixture of organic matter will remain fresh longer and reduce rots associated with stale conditions. Avoid cedar wood chips; they contain allelopathic chemicals (growth inhibitors). Artificial bogs and other speciality beds are not necessary to grow cypripediums.

When growing *Cypripedium* in the garden make sure to spread out the roots in the upper twelve cm of soil, the rhizome three cm below the surface of the soil. Fill in the remaining substrate without compressing it and water thoroughly.

The ground should never dry out completely during active growth. Fertilize your cypripediums regularly during springtime, using fertilizers at half concentration. Early applications of nitrogen even before the buds emerge in spring are recommended. A healthy rhizome has enough stored winter energy (carbs) to begin growing before it even starts photosynthesis. When you feed early all that winter storage will be used later in the growing cycle to produce buds for the following year. In the fall, apply slow release granular fertilizer, in the spring use a balanced liquid feed; both are effective.

Cypripedium 'Kentucky Pink'

Cypripedium parviflorum var. *makasin*

Cypripediums grow best alongside slow-growing ferns, *Epimedium* (Barrenwort), and *Trillium* species. *Corydalis solida* cultivars along with *Jeffersonia dubia* and *Hepatica* selections are among my favourites. Cypripediums are hardy plants in my (Calgary) climate and are built to completely freeze in the winter. We are growing in zone 4, which

Cypripedium 'Birgit Pastel'

means -40° Celsius for a few weeks at a time during winter is our normal. Summer highs can be in the mid 30s for a week or two at a time. Calgary is considered a steppe climate and can experience chinooks (warm winds) throughout the year. *Cypripedium parviflorum* var. *parviflorum* grows wild throughout Calgary and area. It has adapted and thrives despite our extreme temperature fluctuations in the spring and fall. This is why it is such a valuable parent in hybridizing good garden friendly slippers.

The number one pest for *Cypripedium* is slugs. Special attention should be given during early spring as new shoots emerge.

Although it may be more challenging to manage, cypripediums may also be cultured and grown in pots. Winter temperatures to accommodate tender slippers can be anywhere between -4° Celsius and +5° Celsius for at least three or four months. A cool basement or a particularly chilly window will often be enough to accommodate a wide range of temperate tenders. I myself use an unheated garage and supplement the heat in the growing area with a space heater set to come on at -4° C.

Cypripedium x *columbianum*

Cypripedium 'Frosch's Queen of the Mist'

Winter watering can be a challenge and will depend on the species. Cool temperatures and wet conditions can cause problems; keep them on the dry side; I generally check the plants every couple of weeks. Use just enough water to wet the media; the plants are not using it, it is merely to keep the plant from desiccation. Bone dry media will draw moisture out of the plant whereas really damp and wet conditions will cause issues with mould and lead to the rhizome rot.

A good peat-based potting mix is all that is required to grow healthy orchids. I suggest Pro-mix with a little extra perlite. Also, it is important to note that potting media and garden soils are different animals – they are not interchangeable. Potting mix is not a soil substitute, nor does garden soil do well in pots. If you are planning on growing in containers year round then over-potting is recommended because larger containers have fewer fluctuations in moisture and temperature.

This year I am doing it all pot-free in freezer bags with a little perlite and a couple of drops of water. The plants have been in storage for three months without watering yet and are looking healthy. As I write, a few are coming out of dormancy ready to start growing.

This article was published in its first form in the journal of the Ontario Rock Garden & Hardy Plant Society.

Facing: Cyril Lafong's pot of *Cypripedium* 'Ursel' (*C. fasciolatum* x *henryi*)

A few old leaves could help save a species: How *Salix* x *boydii* leaves could encourage captive Spoon-billed Sandpipers to breed

Nigel Clark and Ian Bainbridge

The Spoon-billed Sandpiper is one of the rarest birds in the world and will soon be extinct if the decline in its population is not halted. This diminutive shorebird or wader, about the size of a House Sparrow, breeds on the coasts of the Russian Far East, mainly in Chukotka, and migrates to the coasts of Southeast Asia to winter. 'Spoonies', as they are affectionately called, were never common but the population nosedived in the first decade of this century and there are now thought to be fewer than 250 pairs left. In 2010 it was realised that, without dramatic action, the species would be extinct by 2019 as it was declining by 25% each year. Conservationists from around the world swung into action to address the causes of the rapid decline which were manyfold. Importantly, hunting of shorebirds for food in poor communities in south-east Asia was identified as a major reason. A lot of effort has gone into changing the lifestyles of the people who hunt, and most have been helped to find alternative sources of food while also improving their lives. This, together with protection of several key areas, has reduced the decline to about 8% per year, which is great but shows that there is more to do.

Spoon-billed Sandpiper nest on the tundra, with species of *Salix* and *Primula*

In 2011 the conservation community decided that it was essential to set up a captive population to reintroduce to the wild if we could not change the fortunes of the population in time. Twenty eggs were collected in 2011 and another 20 in 2012 to set up a captive population at the Wildfowl and Wetlands Trust at Slimbridge in Gloucestershire.

At nest with chick; even the chicks have the distinctive spoon-shaped bills

Spoon-billed Sandpiper nest and eggs, with *Salix reticulata*?

Despite the birds doing well and displaying, it has proved hard to get them to lay eggs. Each spring there is a lot of displaying and the males form nest scrapes, but few eggs have been laid. Each year new modifications are made to the breeding aviaries to try and induce the females to lay and finally, in 2019, two chicks were reared by one female.

The one remaining accessible colony in the wild at Meinypil'gyno in Chukotka was visited by Professor Rhys Green of the RSPB in 2019 and he made a detailed assessment of the nest cups of all the pairs the team could find. All the nests were lined with small dried arctic willow leaves, probably *Salix arctica*, which are not available to the captive birds, and which provided an insulated 'bed' to the nest. Could this be the key to inducing them to breed? The nests are small, so normal British willow leaves are too big to be used, but Rhys thought that rock gardeners may have something suitable and contacted Ian Bainbridge, an old colleague,

Previous year's old nest, with *Loiseleuria procumbens* and *Empetrum* species

Empty nest in *Vaccinium* sp. and *Empetrum* sp., lined with *Salix* spp. leaves

to see if he could find something suitable. Ian collected leaves of as many dwarf willows as he could, and Rhys's judgement was that the most similar leaves when dried were *Salix* x *boydii*. That was a real blessing, as many of the other species were far less common in gardens.

So, how could the project get good volumes of *Salix* x *boydii* leaves? Ask SRGC members of course! The call went out to collect leaves. The response was fantastic: members sent over 10 litres of leaves, and a big box was posted to the Wildfowl and Wetlands Trust at Slimbridge at the end of the winter. The leaves have been placed in the breeding enclosures prior to the pairs moving into their breeding aviaries for the spring, during which the Slimbridge aviculture specialists will assess whether the birds like the new addition to their environment, and whether it makes difference to their breeding season. We don't even know which of the birds might collect and place the leaves. If it works, you may be asked again to contribute to the conservation efforts to save one of the world's rarest waders!

Carole Bainbridge with the biggest donation of *Salix* x *boydii* leaves, from Graeme & Hilary Butler at Rumbling Bridge

The Alpine and Rock Gardening community has for many years benefited from the energy and passions of Ger van den Beuken and his wife Mariet. Ger has been tireless in bringing the plants of South America to our attention. He has led nine expeditions to Chile and Argentina, each helping to inspire his companions with the wonders and astonishing plants of this remarkable land. Ger & Mariet have contributed generously over many years to the exchange of information at many Alpine and rock gardening conferences and Ger's bouncy welcoming bonhomie has cheered many old and new participants.

Ger & Mariet have travelled extensively in Europe, North and South America, China, New Zealand and Turkey to see plants in the wild. Ger is known as a president of the Dutch Alpine Garden Society (NRV) and as a vice-president of the Saxifrage Society. When not exploring exotic parts of the world, Ger has become well-known for his nursery in the Netherlands, specializing in rare alpines. His interest started about thirty-five years ago, during his first treks in the mountains. Although growing alpines in the lowlands of the Netherlands (average height being only 30 metres) presented him with many challenges, he focused particularly on the challenges of high alpine vegetation such as *Saxifraga*, *Androsace*, *Dionysia* and *Daphne*.

In a tribute to this plant explorer and for the pleasure of all who have followed him in person, pictures, prose, planting, propagation or passions over the decades we are delighted now to start a series of articles in which Ger distils and shares his knowledge of South-American plants; for each species he covers form, flowers, location and cultivation. Because of the huge variety and the depth of material, Ger's account will be spread over forthcoming issues of *The Rock Garden*, and it will become a valuable repository of knowledge and expertise for many years to come.

An Essay from Argentina and Chile

Ger van den Beuken

It was 2017 when I decided to finish organizing tours to South America. Slightly aging, the responsibility of leading big groups was too much for me. It had been a fantastic job and during all those years we made many friends from all over the world. I extend special thanks to our very good friend and remarkably informative Argentinian guide, Marcela Ferreyra. It was quite emotional to say goodbye to Patagonia and to leave behind all those awesome plants and the spectacular nature of this astonishing land. However, we have the memories and I would now like to share this information with you in this and the following articles. I do not tell a travel story but I show you the best plants, together with a brief description of their habitat, location and – eventually – our experience of their cultivation and propagation. It is important to share this knowledge because many South-American plants are still unknown to many alpine growers; with this series of articles I hope to encourage you to make a start with this fantastic vegetation. We start with the letter A.

The Letter A

Adesmia ameghinoi is a common species of the southern Patagonian steppe of Santa Cruz and grows on dry mountain slopes up to altitudes of 500 m. This species forms cushions of more than 50 cm with tiny obovate leaves and solitary yellow-brown flowers. It needs alpine house conditions. Propagation is from seeds.

Adesmia aueri grows on or between lava rock in the eastern part of Santa Cruz and Rio Negro in Patagonia at an altitude of more than 1000 m. We have found this rarity at only one place during all our trips. Cushions covered with stemless orange flowers and almost a metre wide were no exception. As far as I know the species is not in cultivation. Propagation is from seeds, if possible.

Adesmia capitellata comes from the north of Neuquén. The altitude was about 3000 m on a huge scree. It is a very small and compact species and plants larger than 20 cm were an exception. The tiny mats formed of bright grey-green hairy leaves carried beautiful yellow-brown flowers. It is probably only a dream to grow this plant. Propagation from seeds.

Adesmia parvifolia is a small mat-forming plant that comes from damp habitats in the volcanic districts of Santa Cruz, Neuquén and adjacent parts of Chile. Altitude to 2000 m. Flowers are solitary and stemless, in a pale blue-white colour. It is a pretty species, hopefully offering something new for the future. Propagation is from seeds.

Adesmia villosa is a common and short-branching species of the steppe throughout Patagonia, growing in stony soil up to heights of about 800 m. Like other *Adesmia* species, *A. villosa* is known to fix Nitrogen in soils. It has large yellow flowers on stalks of 2 cm. Propagation of this species is from seeds.

Alstroemeria aurea (Left) is a species more than fifty cm tall from open places in forests. We have seen this yellow-flowering beauty in Chile at relatively low altitude. Orange forms are no exception. Propagation from seeds.

Alstroemeria diazii (Left) grows in the central Andes of Argentina and Chile at altitudes of about 3000 m. The species is up to thirty cm length in a soft pink colour. Propagation from seeds.

Alstroemeria patagonica (Right) is a stunning species from dry sandy places, found especially between low shrubs but also in open places up to a height of 500 m. It is at home from Tierra del Fuego to northern Patagonia and adjacent Chile. The bright yellow flowers on ten cm stems appear before the leaves. This species is rarely seen in cultivation. It is only suitable for the alpine house. Propagation from seeds.

Alstroemeria spathulata (Right) is a species mainly growing in screes in the central cordilleras of Chile to heights of more than 3000 m. Pale rose-pink funnel-shaped flowers, 3 to 4 cm.

Alstroemeria umbellata is somewhat similar to the previous species but is different in leaf shape. We have seen this species on a huge scree in the Maipo Valley, south of Santiago in Chile. Altitude more than 3000 m. Big clear rose-pink flowers. The propagation is from seeds.

Anarthrophyllum cumingii is a small shrub up to thirty cm, common in the central cordillera of Chile to an altitude of 3000 m. The habitat is dry, sandy and gravel. Flowers are yellow. Propagation from seeds.

Anarthrophyllum desideratum is a loose spiny cushion-forming shrub to sixty cm tall, sometimes more than a metre wide. The species is spread throughout southern Patagonia and grows mainly on the dry steppes. More than 1000 m altitude are exceptions. It is a challenge to grow this scarlet-red flowering plant. Propagation is from seeds.
Anarthrophyllum strigulipetalum is a densely round shrub, fifty to sixty cm high and up to more than a metre across. Located in the southern Andes of Argentina, 800 m altitude. The flowers are orange or orange-yellow. I know of no data about cultivated plants. Propagation from seeds.

Argylia adscendens is a compact species, forming mats more than a metre across, mainly growing in the Central Andes. We saw these nice specimens with five cm yellow flowers in the Maipo Valley region near Santiago where they were growing in bone-dry habitats at nearly 3000 m altitude. Propagation from seeds.

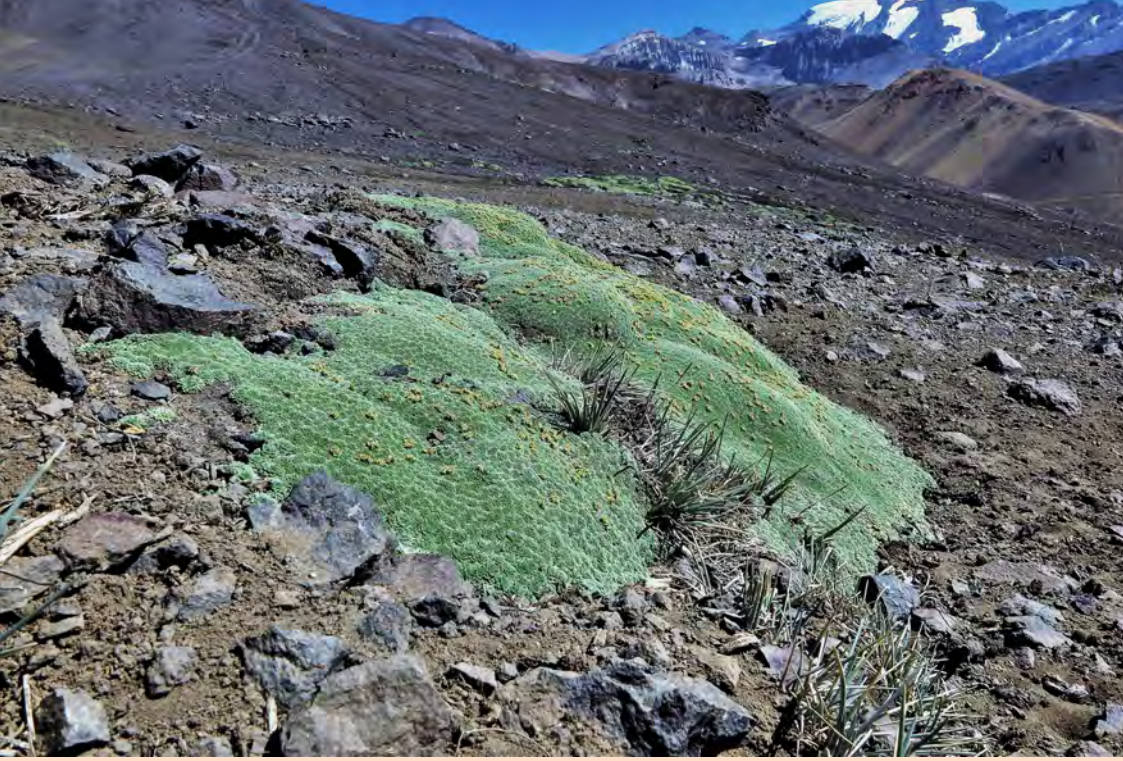
Argylia bustillosii is a spiky branched sub shrub about thirty cm tall with six cm solitary clear yellow-brown marked flowers. From the Central Andes in Argentina and adjacent Chile, it grows in fine ash screes at an altitude up to 3000 m. Propagation from seeds in the spring. Cultivation in a raised or bulb bed.

Astragalus arnottianus is a flat-growing cushion mainly found in the Northern and Central Andes of Argentina and Chile up to 4000 m altitudes. At 3400 m we found beautiful very compact cushions with dark purple flowers. The plants were growing in very dry soil. The propagation is from seeds. If possible to grow, it would be an awesome plant for showing.

Astragalus palenae var. *grandiflora* comes from the Central Andes in Argentina, about 2000 m altitude, growing in dry sandy places. It is a beautiful species with brilliant blue white-marked flowers. The seed pods are very attractive as well. Propagation from seeds.

Astragalus vesiculosus is a very compact species from the high screes in the Argentinian Andes around 4000 m high. Flowers dark blue and white marked above grey woolly leaves. It is almost impossible to grow.

Azorella lycopodioides is a cushion species ten cm high and can be almost a metre across. The flowers are pale yellow. Mainly growing in moorland and peaty soil in Tierra del Fuego, the Falklands and the southernmost region from Patagonia. Propagation from seeds or cuttings.



Azorella madreporica is a fairly rare species growing ten cm high and sometimes two metres across. The flowers are pale yellow. In the Central Andes of Chile we have seen this species growing on pure lava screes. Altitude about 4000 m. Propagation from seeds and cuttings.
Azorella trifurcata is a mat- or cushion-forming species about ten cm high and more than a metre across, found from Tierra del Fuego to the north of Chile. The flowers are pale yellow. Propagation is easy by dividing, cuttings or from seeds. The cultivation is easy, and the plants grow in the rock garden without any problem.

Azorella monantha is the most common species from Santa Cruz and up to the North in Mendoza. The species forms impressive hard cushions, ten cm tall and one metre across, on rocks or sandy slopes at altitudes from sea level to 3000 m. The flowers are creamy yellow. Propagation is from seeds or cuttings.

The Altiplano - the scene of many of our wanderings and flower discoveries

Kendal Show, 15 March 2020

The show got under way before Corona virus closures. In the circumstances, numbers held up very well (over forty). The standard was very high, with several plants of Farrer or Forrest medal quality. In the end, Frank Hoyle triumphed with a 30 cm plant of *Saxifraga* 'Coolock Gem'. The overall number of plants was lower than normal but that was to be expected. The large six pan in the open (won by Frank) was one of the best ever seen at an AGS Show. Frank also put on a wonderful photographic display of plants from the Rocky Mountains around Denver that was awarded a large gold medal.

In the large open, two impressive plants were Peter Hood's *Kelseya uniflora* and Alan Spenceley's *Trillium nivale*. The *Kelseya* was a venerable plant over ten years old and was covered in a sprinkling of flowers. The *Trillium* is much older, heading for its fiftieth birthday party, and it had many flowers in excellent condition. Unfortunately, they were both in the same class (Native to the Americas); after deliberation, the judges decided the *Trillium* was the better show plant on the day. Also in the large open, a pot of *Narcissus* caught the eye. This was *Narcissus alpestris* from Alan Furness. Although this plant is sometimes lumped into *Narcissus pseudonarcissus* var. *moschatus*, it is better kept as a separate species. Another notable plant was Cliff Booker's *Shortia uniflora*, respendent with over twenty large pristine flowers.

In the small open, the *Primula* classes were strongly contested with several entries in each. In class 60 (*Primula allionii* or hybrid), a *Primula* x *meridiana* from John Richards was quite different to the normal ones, looking closer to *P. marginata*. A new *Androsace* was exhibited in class 96: this was Geoff Rollinson's *Androsace ovczinnikovii* from the Tien Shan and Altai mountains. The species is related to *A. villosa* but is more compact and with shorter peduncles – an interesting new addition, grown in Geoff's standard *Androsace* mixture of 60% grit, 20% JI No. 3, and 20% leaf mould. Another plant that stood out in the small open was a delicate dwarf form of *Bulbocodium vernum* from Mala Janes, in class 76. This was a darker purple than normal with very short leaves.

The B and C sections were better represented than for many AGS shows, which was good to see. One plant that produced quite a lot of interest was Alan Oatway's *Berneuxia thibetica* in class 131. It had been dug from the garden a couple of days beforehand. This woodland plant comes from the Himalayas, normally growing in organic soils.

Although a lot less of the public came through the door than usual, it was a very successful day. Our cordial thanks go to Alan Oatway and his team for ensuring that everyone was well looked after, especially with the impending threat from the virus. Sadly, this was probably the last show for some time.

Brian Burrow

Hepaticas at Kendal

Hepaticas combine spectacular colours with seemingly infinite combinations of petal and sepal forms, and tints. Brian & Shelagh Smethurst won their three-pan class with *HH*. 'Blue Sandon', 'Ryugetsu' and 'Hohobeni' (above, top row). *HH*. 'Hazelwood Froggie', 'Touryoku' and a blue *H. japonica* are below them. Most of the 'fancy' hepaticas on the benches were forms of *H. japonica*. Below, top row, are *H. japonica* 'Reisan' and 'Gyousei', with the lax-growing *H. transylvanica*. At the bottom are *H. nobilis*, *H. japonica* and the plant that won the Clarkson trophy for best *Ranunculaceae*: Bob Worsley's *Hepatica acutiloba* - the best hepatica in the show!

This is why we grow rock garden plants. This is what we share with friends. If the general public had any idea that flowers such as these are available, why would they grow bedding plants?








Bob Worsley's winning trio at opposite top left illustrates perfectly the beauty and attraction of hepaticas. At top right is show secretary Alan Oatway's young plant, first prize in Class 156. Opposite centre is *Hepatica* x *schlyteri*, a hybrid of *H. nobilis* and *H. Maxima*, shown with the much smaller old-time favourite, *Hepatica* 'Millstream Merlin' in front to give an idea of their comparative size. *H.* 'Millstream Merlin' was originally raised by the late president of NARGS, Linc Foster and his wife Timmy.

Below opposite is a trio of John Bunn's fine lilac-flowered hepatica, a *Hepatica* 'Tamakujaku', and *Hepatica pubescens* from John Savage. This last is a new plant to me. I sought Ashwood Nursery's advice. Here it is: *'H. pubescens is well worth trying in a sheltered position on the rock garden but they are much better grown in an alpine house, where they will flower to perfection. We prefer to grow H. pubescens in clay pots with a free draining compost. The simple elegant flowers are white, pink or a pale reddish violet, but not blue, and can be beautifully bi-coloured. They have the least number of sepals, pistils and stamens of all the Japanese hepaticas; the sepals are oval and the pistils are dark red in some populations, flowering from February to March The evergreen foliage can be beautifully marbled, with rounded lobes and is densely covered with very fine hairs in most populations.'*

Otherwise, the Dutch site https://www.newplantsandflowers.com provides me with a quote about growing hepaticas: *'Ashwood hybrids Mixed Shades, have been bred by nursery owner John Massey for their garden worthiness. These hybrids combine together the bold flower colours and form of the European H. nobilis and the vigour and large handsome, evergreen foliage of H. maxima. According to the nursery they have the superb large leaves of H. maxima and either blue or pink flowers from February to March. Ashwood Nurseries recommends in its consumer information that European hepaticas should be planted on a cool, well-drained slope in a light 'fluffy' soil rich in leaf mould. It is essential that they are exposed to early spring sunshine, but they must receive plenty of shade immediately after flowering and especially during the heat of the summer. They will thrive under deciduous trees and shrubs or in crevices in the rock garden, performing best where there is good humidity. They respond well to a top-dressing of leaf-mould in autumn and an annual feed of fish, blood and bone in late winter. Height: 15-30 cm (6-12 inches). Hepatica* x *schlyteri Ashwood hybrids Mixed Shades are listed as hardy plants.'*

Take a wee while just to study the intricate differences in flowers, anthers, sepal colours, shape and number in the hepaticas in this report. Nurseries like Edrom are distributing wonderful selections each year and you may also choose them in flower at Kendal most years.

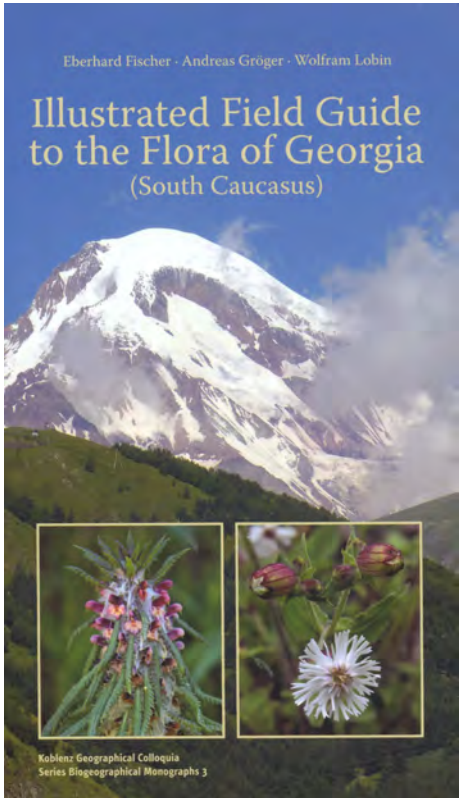
Sandy Leven

Illustrated Field Guide to the Flora of Georgia

Eber Fischer, Andreas Gröger & Wolfram Lobin (2018)

3500 colour photographs, 1010 distribution maps, 830 pages. About £30

ISBN 978-3-9820257-0-4.



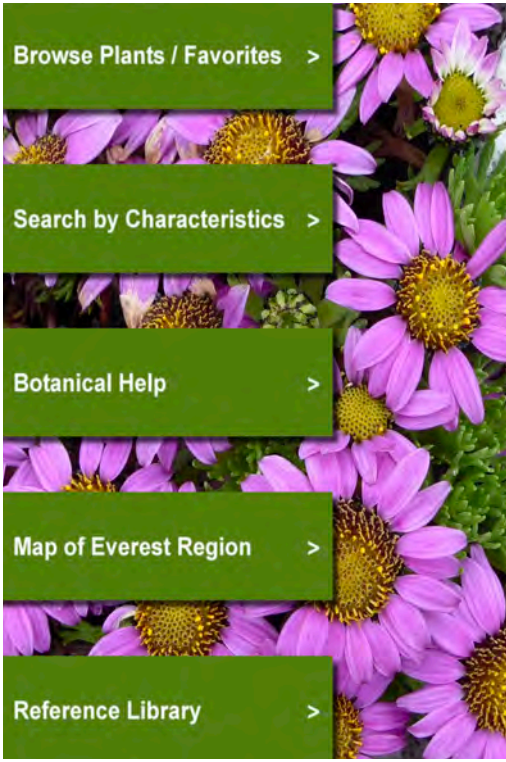
There is a huge range of ecosystems in Georgia from forest to steppe, ranging from the Mediterranean vegetation by the Black Sea to the alpine meadows of the glaciated peaks inland. The country therefore plays an important part in the biodiversity of the Caucasus. This book, written in English, is a welcome addition to the material presently available to all those interested in the flora of this region. It is a well-illustrated volume, first presented at the Frankfurt book fair in 2018, and is the product of about twenty years of expeditionary work by the authors, who are botanists connected to German universities and botanic gardens, and who are advised by their Georgian colleagues in Tbilisi and Batumi. As a result of this effort, many of the book's three and a half thousand photos were taken in the wild.

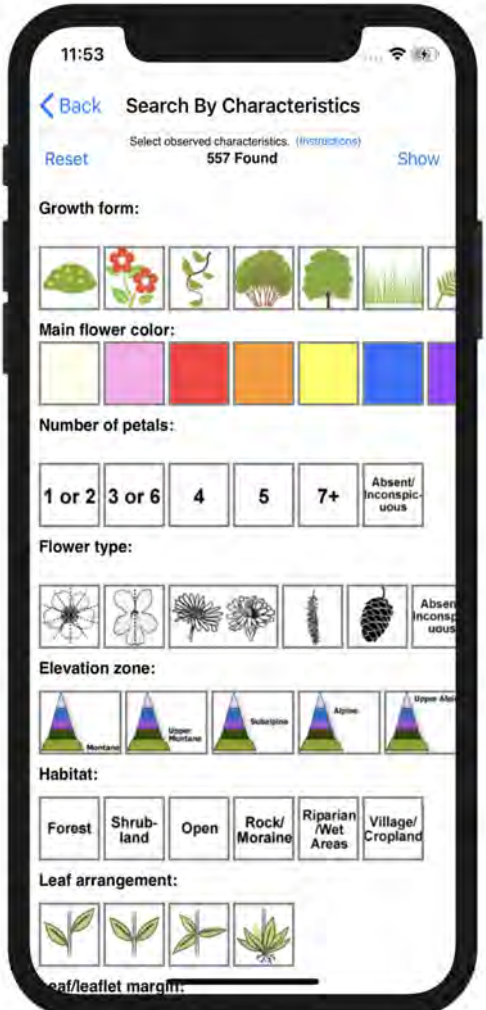
The guide is designed as a practical companion for excursions, both for nature enthusiasts and botanists. As a field guide it usefully shows more than 1200 species, almost a third of the Georgian flora. The species are grouped taxonomically rather than by colour. Although intended as a field guide, it is printed on high-quality glossy paper, which – combined with the generous number of pages – means that it is both very heavy and quite unsuitable for use anywhere damp; this restricts its use to all but the strongest backs. My only quibble after a perfunctory perusal is that the plant descriptions, although complemented generously by the pictures, are perhaps just a bit too succinct. Overall this is another must-have for the enthusiast!

Michael Almond

Wildflowers of Mount Everest
Elizabeth Byers
High Country Apps (2020) £6.99

This the first-ever plant identification app for Nepal, for Apple and Android devices. It offers virtual exploration of the beautiful sub-alpine forests and alpine flora of the Sagarmatha National Park. The app was created in partnership with the Flora of Nepal Project, the Department of National Parks and Wildlife Conservation, Nepal, and High Country Apps. Download is fast and easy and the app opens with a clear and easily understandable homepage.





The index is straightforward but, if you need to identify a plant, searching is also simple, keyed on form, colour, flowering time, habitat and leaves. Your search is rewarded from more than 2500 beautifully detailed images (photos and drawings) of the flowers, leaves and seeds of more than 550 wildflowers, shrubs, and trees that grow on the slopes near Mount Everest. The botanical help, maps and references are informative, thorough, clear, and easily accessible. This is a useful and versatile tool for expeditions and armchair botanists alike. Buy it; try it; love it.

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Urginea maritima: 145/61
Urospermum dalechampii: 145/50
Urtica dioica: 142/69

Vaccinium myrtillus: 142/**64**; 65
— vitisidaea: 142/69
— vitis-idaea: 142/65
Valeriana montana: 142/**71**
Verbascum phoeniceum: 145/41
— sinuatum: 145/61
Veronica aphylla: 142/67
— gentianoides: 143/34
— liwanensis: 145/45
— montana: 142/71
— saturejoides: 142/66; 67; **67**; 69
Viburnum betulifolium: 143/63
— erubescens: 142/9
Vincetoxicum hirundinaria: 142/33; **36**
Viola altaica: 144/15
— arvensis: 143/41
— corsica ssp. limbaraei: 145/60
— hirta: 145/52; 59
— kunawurensis: 144/**13**; 15
— somchetica: 145/37; **38**
— tianschanica: 144/**13**; 15
— zoysii: 142/66; 67
Viscum album: 143/62

Wahlenbergia polytrichifolia ssp. dracomontana: 143/85; 85
— pulvillus-gigantis: 143/86
Waldheimia glabra: 144/**63**
Wulfenia carinthiaca: 144/71

Zaluzianskya distans: 143/78
— oreophila: 144/73
— ovata: 144/73: 143/82
— pulvinata: 143/83
Zanthoxylum acanthopodium: 143/60
— aff. acanthopodium: 143/**61**
— bungeanum: 143/60

SRGC

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If you would like to discuss these positions informally, please contact the secretary Hannah Wilson at hwilson@rbge.org.uk

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Contacts:

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