THE FRITILLARIA GROUP

JOURNAL 48 SPRING 2021

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A small specialist journal such as ours relies heavily upon contributions from the members. The Editor welcomes all articles on the genus *Fritillaria*, in cultivation or in the wild, short or long. Please share your thoughts, insights and images with your fellow enthusiasts. The journal won't happen without you.

Front cover picture: *Fritillaria amana* grows well in a dry bed with perennials which take over in the summer.

Back cover picture: *Fritillaria pyrenaica* grows with *Narcissus triandrus* in the Picos de Europa.

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Contents

Chairman's Chatter

Sadly, for the second year running, we are unable to run our Spring meeting and show and we will have to look at possibilities to run something in the autumn. Happily, several of our members have spent the time that they would have been meeting or travelling and applied finger to keyboard to produce another bumper issue of our journal. Thank you to all the authors. That does mean that although I have one large article to follow in the next issue, we will need more so please continue to supply articles, letters, photographs or any feedback to me for inclusion.

Fritillaria tuntasia

Lynn & Michael Almond

In late March/early April 1998, we went to Serifos and Kithnos, the only two places where *Fritillaria tuntasia* is known to grow. We explored Serifos fairly extensively (it is a small island). On Kithnos we went no further south than the radio masts by the Ay Dimitrios road about 500m south of the Kanala turn (about halfway down the island). There is no reason why most north-facing slopes further south should not also have *Fritillaria tuntasia*.

On Serifos we found 5 distinct sites for *Fritillaria tuntasia*. Sites were generally on exposed hillsides well above sea level.

On Kithnos we found 24 distinct sites for *Fritillaria tuntasia* in the northern half of the island. Sites were generally not as exposed as on Serifos and went right down to sea level. *Fritillaria tuntasia* was much easier to find on Kithnos than on Serifos.

Fritillaria tuntasia, in our experience,

* is always scented;
* is always on slopes with a roughly northerly aspect;
* grows usually on grey schist, although we did find it once on limestone (*cf Fritillaria obliqua* habitat)
* can grow at any height above sea level (bearing in mind that the highest point on Serifos and Kithnos is only about 480m).
* Commonest co-habitants were *Iris tuberosa*, *Anemone pavonina* and orchids of several genera.

The literature makes several comments about the differences between *Fritillaria tuntasia* and *Fritillaria obliqua:*

"In outward appearance it (*Fritillaria obliqua*) closely resembles *F tuntasia*, but whereas the style of the latter is entire, that of *F. obliqua* is distinctly trifid." (Beck, C: *Fritillaries*, p 54).

Fritillaria tuntasia on Serifos

"This species (*Fritillaria obliqua*) and *Fritillaria tuntasia* can be easily confused, although the styles are different. Other major differences include the absence of grey bloom on the leaves of *Fritillaria tuntasia* (and) its stouter, taller stems."

"*Fritillaria tuntasia* is like a larger version of this (*Fritillaria obliqua*) with stems to 30cm carrying many more leaves.... The

flowers are however slightly smaller ... and there may be up to six per stem" (Mathew, B: *The Smaller Bulbs*, p91).

"The stems (of *Fritillaria tuntasia*) are 30-45cm and very leafy, the lowest lanceolate, the upper linear, grey-green and twisted.... The style has only a token attempt at three-part division." (Pratt, K & Jefferson-Brown, M: The Gardener's Guide to Growing Fritillaries, pp120 &137)

Fritillaria obliqua is "rather similar to *Fritillaria tuntasia* but with fewer broader leaves and larger flowers." (Phillips,R & Rix,M: Bulbs, p96).

Although we have not seen *F obliqua* in the wild, none of the statements above makes sense to us in view of the very great variation in all these aspects in the wild populations of *F tuntasia*.

Fritillaria tuntasia is widespread on Kithnos with occasional yellow flowered forms

Fritillaria obliqua

Bob Wallis

The islands of Kithnos and Serifos where *Fritillaria tuntasia* occurs have been separated from mainland Greece for a few thousand years so it is not surprising that plants which occur there have evolved slightly differently. Following on from the preceding article, it is therefore worth recording our own experiences with *Fritillaria obliqua* on the mainland.

On three occasions we have successfully sought *Fritillaria obliqua* near to Marathon. The earliest date we looked was on March 20th 2013, and even then, the only flowers we found were on the higher populations, the lower ones having already started seed production. It occurs from right down at sea level amongst phrygana up to the summit ridges of the local hills where it can even inhabit stony slopes with little other vegetation. Our notes state "shattered limestone rock". The hills hereabouts are only 250 m. There was a distinct preference for the north-facing slopes and there were many plants scattered among coarse vegetation of *Salvia*, *Phlomis* and a shrubby *Globularia*, although it was rarely right under shading shrubs in these higher places. Unlike *Fritillaria tuntasia*, the fritillaries that we found were only on limestone and were growing amongst many *Ophrys* and *Orchis* species, *Anemone coronaria* in seed and *Muscari commutatum.*

The height of the stems is used as a character to separate *Fritillaria obliqua* from *Fritillaria tuntasia* but this is quite variable as one might expect and a poor criterion to use. Plants which grew in shadier places were quite tall, up to 40 cm, with multiple flowers whereas those on the higher hills and out on the open struggled to make 15cm. The length of the style branches is also a highly variable character and there is considerable overlap with that reported for *Fritillaria tuntasia*.

F obliqua grows amongst *Muscari commutatum* near Marathon

These minor differences among others and the considerable overlap between them, led both Kamari and Zacharof to agree that *Fritillaria tuntasia* be reduced to that of a subspecies of *Fritillaria obliqua*. Thus the accepted name is now *Fritillaria obliqua* subsp *tuntasia*.(Heldr. Halácsy) Kamari 1991 (Bot. Chron. 10: 259 (1991)). *Fritillaria obliqua* therefore becomes the type subspecies: *F obliqua* subsp *obliqua*.

Both subspecies are on the IUCN Red List as being threatened, where the major threat cited is grazing which destroys the capability to seed, in the case of subsp *tuntasia*. This, urbanisation, fires and collection are the reported threats to the type subspecies. The 2011 citation of the IUCN gives several more sites for *F obliqua* on both the mainland and on Evvia but also states that many of its previous populations have now disappeared largely due to land development and there is no question that this will continue to be a threat in the future. Fortunately, our and the Almonds' searches have identified healthy populations of both subspecies.

F obliqua grows in phrygana vegetation.

The length of the style branches is quite variable in *F obliqua*

Fritillaries at Copton Ash Garden

Tim Ingram

It is the late summer of 2020. We have had just 190mm/7.5in of rain over the past six months from mid-March to mid-September in north Kent, along with close to record temperatures, and resemble more the south of Europe than the green and pleasant Garden of England. Such weather is not so unusual in the south-east but has become more pronounced than ever in what is a clearly warming climate. There can hardly be greater motivation to have more adventures with bulbs.

Bulbs have always been a valuable part of our planting but a large garden of 0.6 hectares/1.5acres can swallow up significant numbers with less impression until they begin to naturalise and spread. So fritillaries, which are more often choice and special and subtle in their charms, have been less a part of the garden than other genera. But the appeal of the genus has always been there behind the scenes, stimulated by seeing species displayed at AGS Shows, from reading the experiences of past gardeners such as Dr. Jack Elliott, and from seeing them used in the extraordinary 'Lime Walk' created by Harold Nicholson at Sissinghurst Castle Garden. Gradually, as our garden has developed an ecology of its own over the 40 years of its existence, we are exploring the role that fritillaries can play in the plantings in more naturalistic ways.

Our garden, Copton Ash, on the outskirts of the small town of Faversham has a rich and fertile 'brick-earth' soil overlying chalk at depth and, with a low annual rainfall of around 635mm/25in, always dries out significantly in summer. This is a classic fruit growing region with amongst the highest summer temperatures recorded in the British Isles. One small bed in the garden in particular, inspired by that bulb walk at Sissinghurst, is packed with bulbous species

including more recently crown imperials to give more drama and height, and has a long succession of interest later into summer with dryland perennials before autumn *Cyclamen* and *Crocus* begin the bulb story again into winter. From this you will see that we use bulbs more ecologically than botanically in the garden, but *Fritillaria* draws both ways as a genus, at once so discrete and yet also so diverse and widespread across the world, and therein comes the great fascination of the Fritillaria Group.

Meadow beneath *Magnolia* ‘Elizabeth’

Fritillaria imperialis ‘Lutea’ and *F meleagris* in grass

Fritillaria meleagris has naturalized along with cowslips (*Primula veris*)

This bed is in a relatively sunny position and has been supplemented with copious amounts of pea gravel over the years. It contains a wide variety of bulbs, mostly those that self-seed and naturalise, and only a few other fritillarias such as *F. amana* (see Front Cover). It is too dry really for *F. meleagris* though the white form of this has persisted for a good number of years. Close by though, and more in the shade of trees, part of the lawn has been left to grow longer in summer and cut and the hay removed after bulbs and meadow flowers have set seed. Here *F. meleagris* has been naturalising slowly along with cowslips, primroses and snowdrops, though set back by the exceptionally dry summers of the past several years which have reduced seed set considerably. The hope is to incorporate more species here over time and increase the richness and diversity of the 'meadow', helped in part by reducing the vigour of the sward by the hemi-parasite *Rhinanthus minor*. *Fritillaria pontica* self-sows modestly beneath a magnolia but *F. pallidiflora*, which we had high hopes for has so far disappointed in grass. This species has established elsewhere in a pretty dry summer spot beneath *Magnolia*

Fritillaria pallidiflora has established in a dry spot under a *Magnolia*

'Wada's Memory', with the summer dormant *Geranium malviflorum*. It also grows well and self-seeds in the semi-arid climate of Bob Nold's garden in Denver as well as in much damper gardens in northern Europe, so we are persevering and growing more plants from seed in order to experiment.

In his excellent book 'Bulbs for the Rock Garden' Jack Elliott says that *F. pyrenaica* is even better at naturalising in borders than *F. meleagris*, writing from his experiences in the warm and dry climate near to Ashford in Kent. Yet this species seems surprisingly rare in cultivation and not readily available from commercial bulb growers. He grew many species in his exciting garden at Little Chart Forstal, a good number in gritty raised beds and rock garden, but others in the open garden and woodland. The potential must be there for a lot more experimentation in gardens if enough species can be grown from seed and distributed to gardeners. In the Fritillaria Group Journal No.20 (2007) the fascinating article by Paul Furse - reproduced from the Lily Group Yearbook of 1972 - shows how successful past gardeners were in growing significant numbers of species in the open garden, often simply by making mounds of friable and gritty compost over heavier clay-loam. Paul Furse also mentions that *F. pyrenaica* can naturalise in grass. Yet, as Laurence Hill says in the following issue of the Journal, fritillaries "remain a Cinderella plant with an undeserved reputation for being difficult to grow."

It is early days for the genus in our Kentish garden and we only have experience with those species that have generally been found to establish successfully within the vagaries of climate and benign neglect. Other than *F. meleagris*, the longest established species is *F. thunbergii*, originally obtained over 30 years ago from The Beth Chatto Gardens. This has grown well in quite varied conditions, both very dry and more moist in summer, and sets a little seed. At the

same time we had *F. tuntasia*, which grew for a few years in the bulb bed mentioned earlier whilst it was more open but has since died out. *Fritillaria eduardii* and *kotschyana* have both established here too but the level of competition and damage from molluscs has put pay to long term success: these would be better amongst more open plantings of dryland alpines in a new part of the garden we are developing more recently.

Fritillaria thunbergii

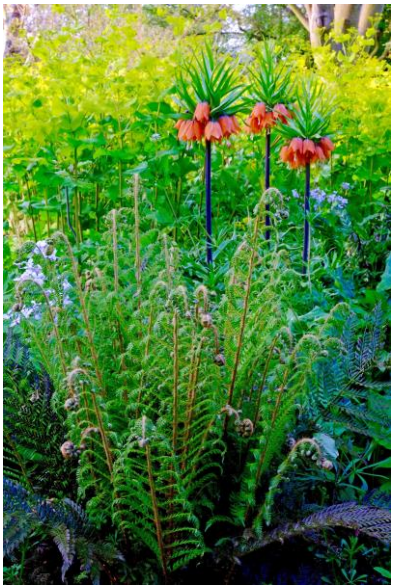
Fritillaria kotschyana

Elsewhere in woodsy soil under an old cherry, planted with many snowdrops and hellebores, a good clump of *F. elwesii* given to me by Jim Archibald gives a fine show, and *F. raddeana* has been planted close by. These woodland plantings are becoming an important feature of the garden in late winter and spring when we open regularly for the National Gardens Scheme charity, with a rich tapestry of woodland anemones and celandines, *Corydalis, Erythronium, Cyclamen, Trillium* and other sylvan species, into which *Fritillaria* could certainly add even more beauty. A clump of *F. affinis* var. *tristulis* grows nearby in the shade of a crab-apple,

only very slowly increasing, but does suggest that other forms of this American, and semi-woodland species in general, are well worth trying.

Fritillaria raddeana and *F elwesii* in woodsy soil under an old cherry tree.

Fritillaria affinis var *tristulis* grows in the shade of an old crab apple



Fritillaria imperialis *Fritillaria persica*

The most dramatic plants of all are the Crown Imperials, which would certainly be marvellous to plant more of but for the relatively high cost of doing this at the scale they deserve in a large garden. Several forms of *F. imperialis* flower reliably and set seed, giving us the opportunity of increasing these in time! And a few of the more recently introduced hybrids show real promise and will definitely make future plantings. *Fritillaria persica* has been a mixed success, growing very well but only flowering as in the picture in occasional years. As yet we haven't discovered what it really needs to flower regularly and perhaps it would be better grown in a bulb frame along with many of the more choice species we have yet to attempt.

The conclusions from this are that Fritillaria do need quite a bit of time and care to really establish well and succeed in the hurly-burly of the garden and will probably remain those Cinderellas, despite the words and successes of different growers at different times. They capture attention much more when displayed in pots and grown in

bulb frames and alpine houses. And it is the dedication of gardeners who grow them in these ways that stimulates wider exploration within a garden setting too. We will try more species from seed and perhaps in a few years' time may emulate those past and present successes and be able to show more examples growing in our garden in Kent.

A pot of obvious hybrids that was given to the Editor for identification. The original label claimed they were *F moggridgei* which they clearly aren't. They appear much like the *F aurea x pinardii* crosses discussed in the next article.

Should we be practising Eugenics on Fritillaria?

Pat Craven & Bob Wallis

The back cover of the of The Alpine Gardener celebrating the 90th Anniversary of the AGS featured an impressive photograph of *Fritillaria ariana* x *bucharica*, the result of a deliberate cross in cultivation. Hybrids between *Fritillaria* species are relatively uncommon in the wild, but there seems to be considerable interest in them among cultivators of the Genus.

In itself this observation might be of little significance but supplies of wild collected seed have all but dried up as a result of prohibition of export of viable plant material from many countries where *Fritillaria* species grow, and increasingly stringent controls over import of plant materials into many countries. The Nagoya Protocol is a far-reaching international agreement which governs movement and use of viable plant materials.

In the wild some *Fritillaria* species produce what are obviously natural hybrids where species grow in close proximity, for example between *F. alburyana* and *F. armena* in Turkey. But some species, while they are familiar in cultivation from a very limited number of introductions, show much more variation in the wild than is seen in cultivation, and so plants which don't fit the familiar cultivated form are sometimes said to be hybrids, without any sound evidence. Hybridisation in the wild is dependent on two species growing relatively close together and flowering simultaneously. Many species have very limited distributions and may well be separated by hostile geographical features such as mountain ranges or stretches of arid terrain. So the potential for hybridisation even between closely related species is relatively low.

Over the years the following have appeared in the Group's seed distribution.

F. acmopetala x pontica: This was first generation seed from *F acmopetala* pollinated with *F. pontica* by Kevin Pratt. Kevin carried out the hybridisation indoors, under glass and the ovary was then

bagged to prevent insect activity. He raised this plant from the seed. Has anyone else raised flowering bulbs from this donation?

FF. acmopetala x pontica (Kevin Pratt)

F. assyriaca x caucasica: These grow together in Eastern Turkey and intermediates are frequently found. The leaves tend to be broader than those of *F. assyriaca* and the style is stouter than that of *F. caucasica.*

Fritillaria pinardii x aurea x pinardii (Don Peace)

F. 'Lentune Freckles' (Don Peace 2017). The result of back crossing the natural hybrid *F. aurea x pinardii* Rix 1602 with *F. aurea*.

F. aurea x pinardii: This cross is well established in cultivation from Martyn Rix's original introduction of Rix 1601 and 1602 (see illustration in ref. 1). It is fertile and the offspring resemble the hybrid rather than the original parents. It has been back crossed with both of its putative parents by Don Peace and produced quite a mixture of forms.

F. aurea x ionica: This was supplied as bulbils which are freely produced. Has anyone flowered it yet? If so, please can the Editor have a photograph.

F. kurdica x straussii: Rix 794 Did anyone raise any flowering bulbs from this? If so please can the Editor see a photograph.

F. davisii x graeca: At least one source of this seed originated in the Mani (Pyrrichos) where *F davisii* is well known. The two species have been reported to cohabit so it is not surprising that hybrids can occur naturally. It is illustrated in Issue 47 page 7 and looks remarkably like *F davisii*. Is it really a hybrid?

F. michailovskyi x kurdica: a second generation from a deliberate cross made by Cyril Lafong.

F. michailovskyi x kurdica: It is a puzzle that seedlings from known wild stock often look to have crossed with *F. kurdica* in cultivation. Moreover, the seedlings produce viable seed so they are obviously closely related. They have quite distinct distributions in the wild and apart from occasional fully yellow forms, *F. michailovskyi* is remarkably constant in appearance in its wild stations whereas *F. kurdica* is very variable, often with yellow tips to the tepals sometimes hundreds of km away from where *F. michailovskyi* is found.

F. liliacea x purdyi: First generation seed produced by Paul Flowers in 2019. Has anyone raised plants from it?

F. purdyi x biflora: Second generation seed from this apparent hybrid was donated by Jane McGary in 2007. Jane adds: "The hybrid was the result of bee pollination (of *F. purdyi*), but its identity is clear from the appearance of the flowers. The plants are much more robust than *F. purdyi*, but their flowers have characteristics of *F. purdyi*.". The progeny are very similar to the parent (two right hand photos below).

F. purdyi x biflora (photos:Jane McGary (left) & Colin Everett (right)

F. recurva x affinis: Ian Young raised this obvious hybrid from *F recurva* seed and supplied bulbils to the Group's seed exchange. Ian writes: "'Craigton Cascade' raised from seed exchange, I think it was NARGS, seed labelled as *F.recurva*. From very early on one of the seedlings stood out as much more vigorous and by the second year I separated the bulb out to grow it on separately from the rest. All the other seeds were *F. recurva* and so I made the assumption that this must be a hybrid. I called it 'Craigton Cascade' because our mature bulbs produced a cascade of up to eleven flowers per stem and as it produced so much rice it was easy to propagate." Mixed colonies of these two species are known in California and hybrids do occur so this is not at all a surprise.

Fritillaria affinis x recurva 'Craigton Cascade'. Raised by Ian Young from NARGS seed as *F recurva*

Of 33 donations of hybrid stock, 21 were seed and 12 were bulblets, and the seed appeared to be viable.

It would be very interesting to get more facts about hybrids and we have received several additional pieces of information as we researched this article which can appear in a later issue of the Journal. In addition, we repeat the request for any photographs of the parents and also of any flowering plants raised from the above. Please also be aware that once we get hybrids, it is extremely difficult to identify the parents with any certainty.

Most of us grow our *Fritillaria* in close proximity and open pollination is inevitably the norm, so the potential for hybridisation and then of subsequent generations being affected by the presence of

hybrids, means that the preservation of wild forms in cultivation may be at risk.

In the interests of conserving wild forms in cultivation should we develop different attitudes to the natural forms and their hybrid progeny, becoming less enthusiastic about hybrids, and more protective of the natural forms or can we do both? The editor would welcome your opinions.

References

1. Phillips & Rix in “Bulbs” second edition p 91. The Pan Garden Plants Series.

Fritillaria hajastanica in southern Armenia

The Flora and Historical Treasures of Armenia (Part 1)

Pietro Roseo

When a person thinks of visiting a country, Armenia is not the first place one would consider for a holiday let alone a botanical trip, but surprisingly enough you would be wrong. The country has a wonderful and varied assortment of plants to see, set among some outstanding scenery and sites of historical interest.

In the past few years, I have been fortunate enough to go on three trips to the country with some of my oldest and dearest of friends simply because there is so much to see. Being about the size of Belgium, one does not have to travel great distances to see things and get a flavour of the country. Grazing and land use is less extensive and intensive than in the countries that surround it so Armenia has a wealth of plants which are rare elsewhere and in some cases they are in profusion.

For such a small country its habitats are varied and extensive with six different vegetative zones: - semideserts; dry steppes; mountain steppes; forest; subalpine and alpine. It has a continental climate with hot dry summers and cold winters with snow and frequent rains in the spring. Occasional storms occur in the summer months which helps to support a variety of plant species.

Each time I have visited it has always been in the first two weeks in May which is a great time to see the flowers. However each year can be very different: in 2013 there was an early spring and there was a drought by May. In 2015, spring was late and although some of the *Oncocyclus Iris* were not out, we did see snowdrops and loads more Junos. In 2016 we hit it spot on and the flowers and the weather were superb. Each time, I was lucky to be guided by the excellent, field botanist, Tamar.

To give the reader a flavour of a typical trip, I will give you an account of where we went and what we encountered. We always

flew to Yerevan. The thing that strikes you about Yerevan is the imposing grey, stark, Soviet style business buildings. One should remember that up until recently Armenia was a Soviet-ruled country and even today Russia has an influence in Armenia. In the distance the skyline of Yerevan is dominated by the imposing presence of Mount Ararat. So we leave the hustle and bustle of the city and head on our southwards journey to Sisian and beyond.

After a few hours, the steppe and semidesert of the Yerevan area gives way to the huge Zargezur mountains ahead of us. Near the Turkh Mamick Pass, the spectacular flowers of deep maroon *Iris lycotis* dot the roadside with some particularly large and impressive forms.

Sisian is set on a high plateau in a semi-circle of mountains. At this time of the year there is plenty of snow around so, as you can imagine, it is pretty cold. Sisian is just down the road from where Armenia's answer to Stonehenge is situated - Zorats Kara also known as Karahunji where the stone observatory is said to predate Stonehenge. In the cultivated fields alongside the road you can find the maroon flowered, recently named, *Iris reticulata* subsp *sisianica* unique in that it produces stolons. Also, in the grass is an *Oncocyclus Iris*; the beautifully lined *Iris acutiloba* subsp *lineolata* and in some of the wetter patches, *I. caucasica,* its yellow flowers infused with blue streaks.

Moving on southwards, we drive through what can only describe as tundra, interspersed with old volcanic mounds. It's quite a stark landscape. The turf here is dotted with various primulas, Calthas and the occasional *Gentiana verna* subsp *pontica*. A brief visit to the Tatev monastery is worth it for the views down the Vorotan River Gorge and also for a ride on the world's longest cable car ride. Leaving the plateau, we now descend to the warmer microclimate of the Vorotan Gorge. Going through the imposing gated town of Goris and past the neolithic cave city, the Gorge has a warm Mediterranean climate all of its own. Here we find wild pomegranate (*Punica*) and Bladder Senna in amongst these scrubby slopes. Yet another

Oncocyclus, *I paradoxa*, plus also some wonderful forms of *I acutiloba* grow side by side. The first of the orchids here is *Anacamptis morio* subsp *picta* and the delightful *Calendula persica* with its small orange daisy-like flowers.

Leaving the Gorge we now head towards the mining town of Kapan, a typical stock concrete Russian town with its large blocks of flats which have seen better days. On the roadsides you can find the rare yellow orchid, *Orchis punctulata*, here locally common. By the lake grows Armenia's only Paeony, *P tenuifolia*. The lake sadly is heavily polluted by sludge from the nearby mines. Kapan is a good base for the area as there are a number of valleys to explore, each with its own varied selection of plant species and one can view to the west of Kapan the looming majesty of Khustup mountain rising to 3206 metres. The forested areas and meadows at the foot of the mountains are interesting. There are the parasitic purple toothwort *Lathraea squamata*, the secretive and the rather strange green and purple hooded orchid, *Steveniella satyrioides* here. The bright blue spikes of *Muscari atropatana* inhabit more open meadow and in the wooded areas, we find the less invasive form of *Allium paradoxum*.

Leaving Kapan and heading westwards before turning South along the main road we make a detour to a nearby dam. Here in the warm microclimate of southern Armenia, the spikes of yellow and orange *Eremurus spectabilis* were striking. On the lower slopes we find *Jurinea spectabilis* and yet more *Iris paradoxa*. Here too was the purple flowered *Onobrychis cornuta*, a plant not to be sat on by mistake - once done, never forgotten! It is a vicious brute covered in nasty spines.

Going past the dam the terrain goes higher climbing above the tree line. Here, rather strangely in the scrub, is a blue form of *Iris reticulata* and the ice blue *Scilla mischtschenkoana*. Scattered in more open grassy areas we come across the first *Fritillaria* species of the trip - a rather robust form of *F kurdica*, in some cases well over a foot tall. The flowers here are more orange than maroon and did not seem to have the normal greyish bloom to them. The bells were

Fritillaria kurdica in Southern Armenia

faintly striped with yellow and the inside of the flowers was yellowish green. Where we found them, they were very scattered and scarce and being protected by a fence it would appear doubtful if any sheep or goats could graze the area. This was the only time we encountered this particular form on the trip.

Making our way back to the main road we now pass through the mining town of Kadzharan before turning South and starting the climb up to the Meghri Pass. On the way up and to the east of the road is a vast open cast mine slowly encroaching up towards the top of the pass. I do wonder what this area may be like in a few years from now. As we drive higher towards the top of the pass there is still a fair bit of snow around. Stopping near the top by the signpost and viewpoint, dotted amongst the snow burnt turf, are blue and white forms of *Crocus adamii* in considerable numbers along with the Barbie pink stars of *Colchicum zangezorum* (= *C freynii*). In the more grassy areas, the delightful pale blue *Anemone caucasica* with its minute flowers and the maroon and white *Corydalis nariniana*, make a striking spectacle.

Once over the top of the pass we start to head down but about halfway down on a bend by a memorial stone we stop. By the road is the tall yellow *Iris imbricata*. Not far from the road and on the rocky slope we encounter more fritillaries. Amongst the rocks and grass we find magnificent bells of *Fritillaria kurdica* again. The forms here show marked tessellation in the bells, with alternate green and reddish maroon petals and a yellowish inside similar to those forms encountered by me in northern Iran in 2017. We also found some yellow forms here. One thing that was strange about the habitat was that the plants were on the South-facing slope which is unusual. The road then snakes its way southwards and down towards the Iranian border passing by rocky slopes and cultivated areas. Every so often we see splashes of fiery red on the slopes and on stopping to investigate we found the large scarlet flowers of *Tulipa sosnowskyi*. As one drives along, Caucasian Agamas nod their heads in displeasure as we pass.

Meghri is the border crossing point with Iran and above the town is a strange looking windmill looking more like some ancient aeroplane in gaudy colours, and the ancient ruins of Meghri Castle. Around the town, persimmon and pomegranates are cultivated. One place certainly worth a visit is the Church of the mother of God built in the 15th century. It has some colourful murals depicting scenes from the Bible and St George and the dragon.

Turning away from the border to the East there is a new road built in 2012 which winds its way northwards through the Shikakhokh Reserve back to Kapan. As this area has only recently been opened up much of the habitat is untouched. The reserve covers a considerable area with meadows and forest, plus high alpine meadows. It is one of the last refuges of the Caucasian Leopards and bears can be found here. Wild boar also roam the area.

In the lower, drier areas, a plant of interest is the pale purple and pink flowered *Delphinium peregrinum*. The flowers and meadows along this road are exceptional: a number of irises like the deep almost black-maroon form of *Iris paradoxa* (subsp *atrata*) is locally common here and shares its habitat with the type subspecies. There are sizable clumps of *Iris acutiloba* some with 15 to 20 flowers, a few, *I grossheimii* and the pale blue form of *Iris caucasica* with *Ophrys sphegodes* subsp *mammosa*, thriving with *Salvia imbricata* and the deep pink *Gladiolus szovitsii*.

The oak woodlands as one climbs higher are home to the cream coloured *Orchis adenochila*, a very local species, and the Caucasian Lady Orchid (*O caucasica*). In an area not far from some derelict buildings we found more red *Tulipa sosnowskyi*. Higher up near the view point it shares its habitat with two other tulips, the similar red form of *T florenskyi* and the yellow form of *T confusa*, a much rarer and more localised plant. Both species also have yellow and pink forms.

Just before one goes into Kapan, there is a series of meadows beside the road and a viewpoint. The meadows hold a surprise or two. As one enters the field below the road there was an amazing sight of

Fritillaria hajastanica west of Sisian

hundreds of yellow *Orchis punctulata* with some plants being waist high. In the long grass it grows side by side with *Steveniella satyrioides.* It is strange to find this plant growing in the open.

Leaving Kapan we now start our journey northwards along a road which takes us along the border with Nagorno Karabakh. As the countryside here looks so similar it is difficult to see where the border starts as it is hidden in the broadleaf woodland. In the woods there are *Galanthus lagodechianus* (on the 2015 trip we found it in flower), *Orchis adenochila, Scilla siberica, Orchis simia, O tridentata* and *Ophrys aestifera*. Some of the areas are very inviting to look at but be aware the area is mined, and in some places, not marked. It made for an interesting time on the first visit when the tour guide found us photographing in a minefield. Let's just say she nearly had a heart attack!

The areas along the road yielded: *Iris imbricata*, *Ophrys sphegodes, Iris acutiloba, Orobanche anatolica* and some beautiful crosses between *Orchis punctulata* and *O simia.* The *Iris caucasica* were yellow with blue stripes on the standards.

Heading past Goris northwards to the Vorotan Pass at 2344 metres, a large concrete structure either side of the road is the symbolic gates of Shurnukh. On the grassy damp areas away from the road there are: *Crocus adamii, Gagea lutea,* including white forms, *Colchicum raddeanum, Puschkinia scilloides* and the delightful cream and pink *Corydalis persica*.

We are now back in Sisian and we take the road westwards towards Nakhichevan and stop to go down to the small gully just off the road. Although the area was heavily grazed, below it on a steep bank interspersed with scrub was another *Fritillaria* in considerable numbers, the chocolate brown bells of *F. hajastanica,* standing between three and four inches tall with long narrow bells and greenish yellow inside. The nectary is set quite well back in the flower. The style and stigma were not extended beyond the bell as often happens in *F. caucasica*. As I understand it there is some debate as to whether this is a form of *F caucasica* or *F pinardii* but

having seen the other two species on numerous occasions my personal view is that it certainly appears different. No doubt time and "the book" will tell. The plants themselves are quite dainty and share the habitat with *Iris reticulata* and *Ranunculus kochii*. Heading into the mountains, near the border the rocky slopes provided much of interest. Yet again there was *Onobrychis cornuta* which seemed to attract Alpine Green Hairstreak butterflies, *Centauria triumfettii* and on higher elevations *Allium akaka* with its drumstick of pink flowers. Another Juno, *I atropotana* and the fluffy *Rindera lanata* completed a striking flora.

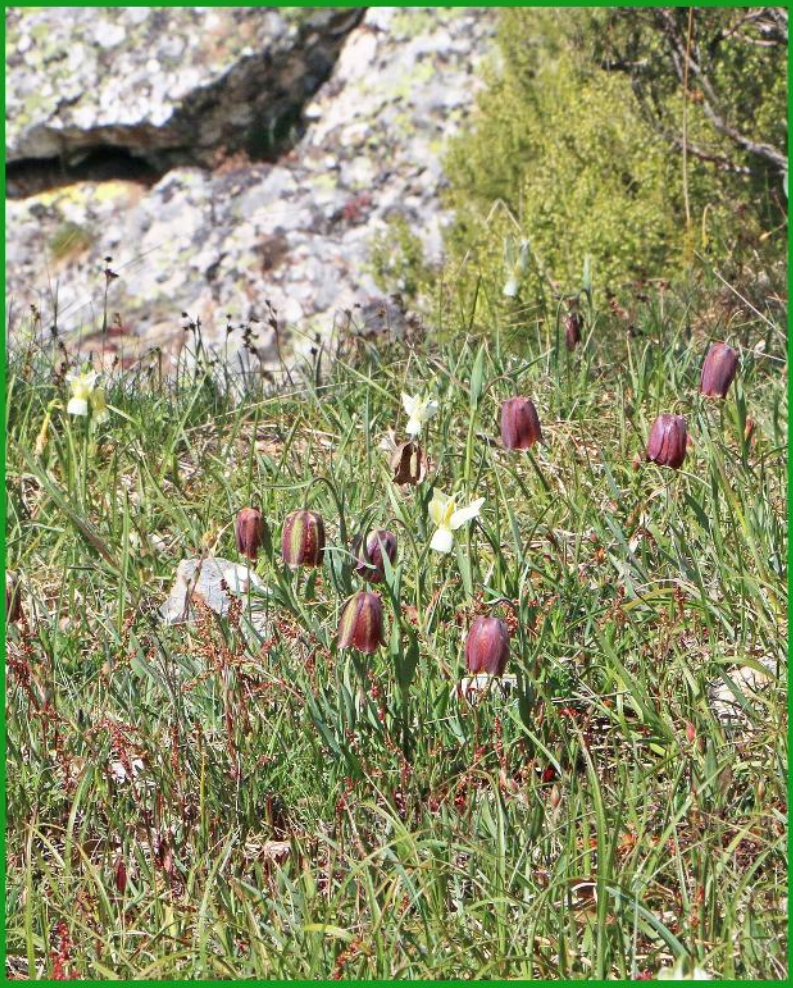
Here, similar to the stone lion-like memorial stones to warriors in Iran, we find some finely carved Redstone Khachkars stones with wonderfully crosses and images to commemorate important people. In some of the grassy areas and the shallow gullies we found more fritillaries in damp areas on slopes. Again these dark brown plants were in considerable numbers growing amongst grass in loamy limestone soil. These again didn't fit the descriptions of *F caucasica* and our botanist guide described them once again as *F hajastanica*. On our way back to Yerevan we found the parasitic *Diphelypaea tournefortii* not yet in flower, growing in a dry area amongst its usual host, *Artemesia*, and the white and red *Eremostachys lanata*.

This rugged and little explored area of Armenia is often overlooked for other areas. In the second part of the article we will travel from central Armenia to the far North of the country where we found many more floral treasures.

To be continued….

Editors note: I aim to discuss the validity of the name *Fritillaria hajastanica* in the next issue so watch this space.

Iris acutiloba subsp *lineolata* in southern Armenia



www.fritillaria.org.uk