



THE

FRITILLARIA

GROUP



The Fritillaria Group of the Alpine Garden Society
Journal 42



**Committee members and contact details can be found on
our website: www.fritillaria.org.uk**

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: *Fritillaria crassifolia* subsp. *kurdica*

Back cover: *Fritillaria bithynica*

Both covers the work of Bob Charman

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**Fritillaria Group Spring Meeting and Show
at Hillside Centre, RHS Gardens Wisley**

Sunday 4th March 2018

08:30 Set up – cars must be clear of the Garden by 09:00.

09:30 Tea and coffee. Plant display opens.

10.30 Lecture: “The Fritillaria Collection at Göteborg Botanical Garden”. Johan Nilsson.

12.00 Lunch and free time.

14.00 Lecture: “Return to Eight-Frit Mountain and Beyond”, by Pietro Roseo

15:30 Raffle & Close of Meeting.

Please bring along fritillaries in flower for the display.

The meeting will be open to the public as well.

Chairman's Chatter

By Bob Wallis

As I write this in early January, shoots are starting to appear on my fritillaries, seed is germinating and the first picture of a flowering plant (in the UK) has appeared on our Facebook Group. What a great resource this is. With its worldwide reach and immediate communication, we can see fritillary flowers in almost every month of the year. The more we post and discuss, the more people will get to enjoy this remarkable genus and may one day join our Group. If you haven't looked already then register, or log in, to Facebook and seek our "The Fritillaria Group of the Alpine Garden Society". Perhaps you would like to share a picture or even get it identified.

Our next meeting, in early March, looks to be another great day. This year we can bring plants for a show at the Hillside Centre in Wisley and be entertained by Johan Nilsson an expert grower from that mecca for rare bulbs, Gothenburg Botanic Garden, and our own Pietro Roseo, a keen and very successful modern day plant hunter.

I hope to see you all there.

Thoughts on *Fritillaria tubiformis* and *F. meleagris* subsp. *burnatii*

By John Richards

In the central Italian Alps this spring (2017) I encountered, not for the first time, large populations of the plant presently known in Britain as *Fritillaria meleagris* subsp. *burnatii* (Planch.) Rix. As on previous occasions, my immediate reaction was ‘this lovely thing has nothing to do with *F. meleagris*’. This strong sentiment has not only prompted this article, but caused me to (finally) join the Frit Group! Later researches show that some Italian authorities now treat this taxon as *F. tubiformis* var. *burnatii* (Planch.) Rouy (Mucciarelli et al., 2014). It has also been given specific rank as *Fritillaria burnatii* (Planch.) Backhouse (1873).

The populations concerned were on the Croce Domini Pass, and the Passo Vivione, to the east and west respectively of Breno, at the eastern end of the Alpi Orobie. Croce Domini is a well-known plant locality, and the fritillary there has been frequently reported, for instance by Lionel Bacon in ‘Mountain Flower Holidays’, who names it *F. tubiformis*. It is locally abundant towards the eastern end of the pass, between the road junction and the path to Cornone di Blumone, flowering towards the end of May, often in company with *Anemone narcissiflora*. The Passo Vivione, between Schilpario and Cedegolo seems to be much less known, not surprisingly as this is a narrow single-track road with some alarming drops. It is best tackled on a weekday out of holiday season! Meadows on the west side have huge populations of the fritillary.

Both populations are somewhat variable, but are clearly the same plant. Essentially this is a medium-sized fritillary with large, dark brownish-purple weakly tessellated flowers which are (when fully open) invariably wider than long (length measured from tepal apex to nectary point). They are variably shiny, and not pruinose. No tepals are acute, although the inners are less rounded than the outers. The leaves are all alternate, have a grey bloom, and most have a maximum width of 10-15 mm. There are (1)-2-(3) alternate bract-leaves.

In the context of fritillaries, the differences between this plant and *F. meleagris* are considerable. They can be summarised as follows:

burnatii		meleagris
maximum leaf-width	10-15 mm	4-9 mm
flower length/width	0.8-0.95	1.2-1.8
inner tepals	obtuse-rounded	acute
flower colour	brown-purple to blackish, shiny	lilac-pink to pale purple(white)
tessellation	weakish	strong
filaments	smooth(-ish)	papillose
habitat	alpine meadows, 1500-2000m	lowland flood meadows

I have no doubt that *Fritillaria* ‘burnatii’ is only distantly related to *F. meleagris*. However, as Mucciarelli et al. suggest, it is much closer to *F. tubiformis*, both being alpine taxa from the south-west Alps. Rix (1980) separates *F. tubiformis* from *F.*

meleagris by its wider leaves, shorter flowers and rounded tepals, but none of these characters helps to distinguish between *F. tubiformis* and *F. 'burnatii'*. However, other authors have mentioned that *F. tubiformis* is distinguished by pinker flowers with a pruinose bloom which are scarcely tessellated outside at all (Grey-Wilson & Mathew, 1981).

I have only seen 'classic' *F. tubiformis* twice, both times above the Col de Bleine, north of Thorenc. Here it conforms to most plants in cultivation under this name, with flowers of a dull plum-purple bearing a plum-like bloom and with very little tessellation outside (Fig. 1). As far as I can see, these plants are structurally similar to Italian *F. 'burnatii'*, but strikingly different in general appearance. The following table compares my observations of Thorenc *F. tubiformis* and Breno *F. 'burnatii'*.



Fritillaria tubiformis, Col de Bleine

tubiformis**burnatii**presence of pruina
(bloom)

yes

no

flowers shiny

often, usually
when mature

no

flower colour

dark
brownish-purple

mid plum-purple

tessellation outside

very little, or absent

yes

filaments

smooth or
nearly so (fid. Rix)

papillose

In my admittedly limited experience, these two taxa are distinct. It is less clear what rank they should carry, and what their correct names are. For the present I am calling them morphotypes, characterised as above.

*Fritillaria tubiformis**Fritillaria burnatii*

F. tubiformis has now been lectotypified using material from Hautes-Alpes (Bartolucci & Peruzzi, 2012) and it seems that

protologue localities are all from this region. In 1855, when this species was published, the epithet ‘burnatii’ did not exist. It is clear from the figures of the lectotype in Bartolucci & Peruzzi that the quality of the material is such that the specimen could be referable to either of the ‘tubiformis’ or ‘burnatii’ morphotypes.

The lectotype of *F. delphinensis* var. *burnatii*, the basionym of ‘burnatii’ (1873), originates from the Col de Tende in the Alpes Maritimes (Bartoloucci & Peruzzi, 2012). I have seen good modern photographs of plants from near the ski centre above the Col (Forum de Botanique website), and these do indeed conform to my concept of ‘burnatii’. The localities sampled by Mucciarelli et al. are all from just the other side of the frontier in the south-west Alpi Maritimi. I have also seen photographs taken by Peter Erskine in the Queyras which are clearly of ‘burnatii’. Thus, it seems that ‘burnatii’ may be the more widespread taxon.

It is important to state that I have no evidence that these two morphotypes ever occur together. If I am correct in thinking that populations of each are always ‘pure’ then I suggest the taxa should be given subspecific or specific, rather than varietal, rank.

The outstanding question seems to be, ‘to which morphotype does the lectotype of *F. tubiformis* belong?’ To answer this, it may be necessary to return to the lectotype locality Lusette en Luz to see if plants can be rediscovered. Peter Erskine has suggested that this locality is now known as the Col de Lus, south of the Col de Grimone about 30 km west of Gap. He identifies the other protologue locality, ‘Mt. Seuse’ as Mont Ceuse which is 15 km west of Gap. At the latter locality he notes that typical *F. tubiformis* is frequent. He regards this district as

‘the centre of *F. tubiformis* distribution’, so that it seems very likely that the lectotype of *F. tubiformis* is indeed what we regard as typical ‘tubiformis’.

Another important distinction between *F. meleagris* and *F. tubiformis* s.l. is that unpigmented forms of the former are white (-ish) and occur polymorphically in most populations. Unpigmented *F. tubiformis* are yellow-flowered and heavily tessellated and are usually known as *F. tubiformis* subsp. *moggridgei*. As far as I know, populations of *F. tubiformis* are never mixed and are invariably yellow or purple, although the two colours can occur in neighbouring districts (Mucciarelli et al, 2014). These authors undertook a genetic study of *F. tubiformis* subsp. *moggridgei* and what they call *F. tubiformis* var. *burnatii* in the Alpi Maritimi, using RAPD markers. They show these taxa to be closely related, and only 6% of the total genetic variance is apportioned between taxa. However, most of the populations do show some genetic discrimination between taxa. This separation was not total, and three of the seven populations of ‘moggridgei’ sampled demonstrated some admixture of ‘tubiformis’ type genes, although they had become monomorphic for the presumably recessive yellow-flowered genotype.

In this study, Muccarielli et al. show considerable genetic partition between populations, not all of which is linked to flower colour. Certainly, flower shape can vary considerably between populations. In the population of *F. tubiformis* subsp. *moggridgei* at Limonetto, just north of the Col de Tende, I measured the flower length/width mean as 1.249 +/- 0.174, (n = 19) (range 1.02-1.62), whereas for the two Breno populations of ‘burnatii’ the comparable figures were 0.916 +/-0.093 (n = 36) (range 0.768-1.085). The two Breno populations did not differ statistically. This might suggest that the yellow ‘moggridgei’

has narrower flowers than ‘burnatii’, but I doubt if this would be upheld if more populations were sampled.



Fritillaria moggridgei, Limonetto

In summary, genetic studies suggest that yellow-flowered populations are suitably treated as *F. tubiformis* Gren. & Godr. subsp. *moggridgei* (Planch.) Rix. It also seems appropriate to treat ‘burnatii’ and ‘tubiformis’ as subspecies. The best interim solution would be to use the new combination *F. tubiformis* Gren. & Godr. subsp. *burnatii* (Planch.) pending investigations into the identity of the lectotype of *F. tubiformis*. If ‘tubiformis’ morphotypes are found at the lectotype locality Col de Lus as expected, this combination would be supported.

Bartoloucci F. & Peruzzi, L. 2012. Typification of *Fritillaria tubiformis* Gren. & Godr., *Fritillaria delphinensis* f. *moggridgei* Planch. and *Fritillaria delphinensis* var. *burnatii* Planch. (Liliaceae) from SW Europe. *Candollea* 67 (1): 23-29.

Grey-Wilson, C. & Mathew, B. 1981. *Bulbs, the bulbous plants of Europe and their allies*. Collins, London.

Mucciarelli, M., Ferrazzini, D. & Belletti, P. 2014. Genetic variability and population divergence in the rare *Fritillaria tubiformis* subsp. *moggridgei* Rix (Liliaceae) as revealed by RAPD analysis. PLoS ONE9(7):e101967.

<https://doi.org/10.1371/journal.pone.0101967>

Rix, M. *Fritillaria*, in Tutin, T.G. et al., 1980. *Flora Europaea*. Cambridge.



Fritillaria burnatii meadow

Plant Hunting in Kyrgyzstan

Words and images by Rannveig Wallis

Kyrgyzstan and Kazakhstan share the Tien Shan Mountains on their north and south borders respectively. Apart from this they are topographically very different. 90% of Kyrgyzstan is in excess of 1000m and 45% is mountains of more than 3000m. Three of the peaks are even over 7000m and are covered in permanent snow. By contrast Kazakhstan is much flatter with vast areas of steppe. The south of Kyrgyzstan is dominated by the high Pamir range. As might be expected the winters are long and cold with much snow coverage.

We started our trip in the second largest city, Osh, where by mid-April, spring had already arrived. Osh is situated on the southern edge of the Fergana valley but it is very close to the foothills of the Pamirs. Rolling hillsides on the edge of the city were covered by large, metre-tall sweetly scented plants of *Crambe* – much enjoyed by the newly emerged bees. On driving south of the city, our first stop was a hillside which was yellow with *Anemone petiolulosa*, There were a few *Tulipa ferganica* and in stonier, less colonised places, the juno, *Iris narynensis*. Here it was in flower but further east by the Naryn river, after which it is named, it was already in seed. Higher up in all the valleys, at around 1700 – 1900m, wherever we searched, we found large numbers of *Fritillaria ferganensis* on steep north-facing hillsides, well covered in spiny shrubs. Although we were too early for flowers, it was easily recognised by its whorls of tendril-like leaves that allowed it to cling on to the shrubs for support of its willowy stems. It shared these hillsides with lots of *Corydalis ledebouriana* and fabulous *C ruksansii*, *Viola* and *Vinca* etc. In one valley flowering *Fritillaria sewerzowii* inhabited stony ledges while *F*

ferganensis was not yet in flower within a few feet but on the steep shrub-covered slope.

On our drive over three passes of the high Pamir to the village of Sarytash (3200m), we passed large areas of *Crocus alatavicus* and *Colchicum kesselringii*. Both grew in short turf, still wet from recently melted snow and when not open, looked very similar, both being white goblets with purple stripes on the outside. It was soon obvious that this area was still in the grips of winter and would yield nothing botanical until much later in the season so we returned to Osh before heading for the capital, Bishkek.

The long road from Osh to Bishkek skirts all around the eastern edge of the Fergana valley, in order to avoid having to cross into Uzbekistan and then follows the Naryn River north-eastwards. Our next destination was Lake Toktogul formed by a dam on the river. South of the lake we found a hillside covered in *Tulipa ferganica* (yellow with red flushed exterior) and a small valley with *F sewerzowii* mostly with already developed seed pods. Many of these plants had grown to 4 feet in height as the pods developed. North of Lake Toktogul, a wooded hillside at 1250m to the west of the main road was full of *F sewerzowii* in prime flower. We also found just a few plants of *F ferganensis* that gratifyingly, as this was one goal of our trip, were also in full flower. The most vigorous one sported four flowers beautifully chequered in green and pink.

The road carries on over the Alabel Pass and into the Suusamyр Valley. The pass was emerging from winter and the flowers were absolutely fabulous (albeit without any *Fritillaria*). As we climbed up to the pass, we stopped at a steep hillside, having spotted *Iris graeberiana* in various shades of blue growing amongst emerging herbaceous plants. Higher up, alpine



Fritillaria ferganensis, Chychkan Valley, N of Lake Toktogul, Kyrgyzstan. (1250m),

meadows were sheets of colour comprising two *Corydalis* species, cream *C glaucescens* and pink *C ledebouriana*. Golden yellow *Tulipa dasystemon* and *Colchicum luteum* formed highlights among the sheets of a paler yellow *Gagea*. In the gravel at the roadside, grew sweetly scented yellow flowered *Choriospora macropoda*. Over the pass in the Suusamyр valley, winter returned but we found lovely patches of *Iris kolpakowskiana*, emerging from the snowmelt.

The Ala Arch reserve, is situated 40km south of Bishkek. At an altitude of 1500 – 2200m there are canyons extending 15km into the mountains. This is well visited and at the entrance, and



Colchicum luteum grows in snowmelt on the Alabel Pass, Kyrgyzstan.
2380m



Iris kolpakowskiana, Alabel Pass, Kyrgyzstan. (2280m)

before I could say “Niet”, a handler placed a large and surprisingly heavy eagle on my arm. Further along the path a

red squirrel fed from my hand. Perhaps we spent too long being tourists because we failed to find any *Fritillaria* there. There were however, plenty of Tulips, *Corydalis glaucescens* and *Iris loczyi*.

Lake Issykul is situated in the far east of the country. At an altitude of 1600m it is the World's second largest alpine lake (180 x 70km) and also the 6th deepest. Its name translates into "warm lake" not that the water is particularly warm but it is named as such because the high salt content inhibits freezing in winter.

We spent several days exploring the valleys radiating from the lake. On the south side in the north-facing valleys, many of which rise up to 3-4000m, we found large numbers of *F walujewii* growing in the shelter of prickly *Berberis*. Unfortunately, because of the later season, they were not yet in flower, although the buds indicated that in a few weeks' time, they would be putting on a fantastic show of their large broad greyish bells with striking red spots inside. As might be expected the south facing valleys on the north side of the lake were florally more advanced. These gorges are famous for the white flowered *Hepatica falconeri* which were occupying rock crevices and steep rocky slopes under the *Picea schrenkiana* forest.

Kyrgyzstan is a spectacular country and in most areas is well set up for tourism. The major roads are good and despite the heavy snowfall these are kept open and are in good condition.

Although home to only five *Fritillaria* species, they come from four different subgenera and grow in large populations that make a wonderful show so we cannot wait to go back.

My Experiences of Germinating *Fritillaria* Seeds In A Fridge

Words and images by Colin Everett

I started germinating *Fritillaria* seeds in the fridge more years ago than I care to think about. This basically came about because I was not getting a satisfactory germination rate and all I could put it down to was the very variable winter temperatures I was getting. So hence a fridge with the temperature set at 5°C. This temperature was picked based on Professor Norman C. Deno's work "Seed Germination Theory and Practice", which suggests a cool germination temperature of 40F (4.4C). What I still do not know for sure is whether it is best to put them straight into the fridge after watering, or like I prefer to do, put them outside for a month or so and then into the fridge. My reasoning in putting the seed pots outside before going into the fridge is so that the seeds and potting mix can be fully rehydrated by the rain. I have put some straight into the fridge after sowing and hand watering them but with poor results, I have only taken this approach with seeds that I have received late in the year. This can most probably be put down to sowing them too late in the year and I now try to not sow *Fritillaria* seed later than the end of October. I have to admit I still at times do try and sow late in the year, thinking I might get away with it. My experience is you may get some germination but it will normally only be one or two seeds at best or more likely nothing. To illustrate this point, I managed to get some *Fritillaria delavayi* seeds in early 2016 and sowed half ASAP (23/01/2016) and put them in the fridge and waited. Not one seed germinated in 2016 even after three months in the fridge or after taking them out into warmer conditions afterward. The remaining half was sown 31/10/2016 and both were put into the fridge after being outside as normal.

The 23/01/2016 sowing germinated on the 31/03/2017 and the 31/10/2016 sowing germinated nine days later on the 09/04/2017 so I did not gain much. It is probably stating the obvious but having a max and min thermometer in the fridge to keep an eye on the temperature is sensible. You may have set the fridge for 5c but if the temperature where it is located goes below this for some time, the temperature in the fridge will drop below 5c as well. A thermometer will also tell you if the fridge is maintaining an even 5c under normal conditions.



Fritillaria seed in fridge 1 Oct 2017

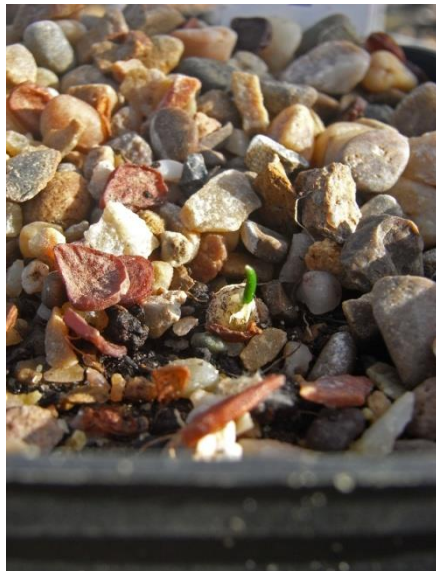
The picture above is one of our fridges which is only a fridge; the other one is a fridge freezer and there is a difference between them. I normally only use the fridge but this year have also had to use the fridge freezer. The pots in the fridge freezer dry out on the surface (where the seeds are) a lot quicker than in the fridge only one. So be advised, keep an eye on moisture levels where the seeds are - they do not want to dry out. If they do it will most probably affect germination.

When I first started, I would put seeds on damp kitchen paper in a plastic bag. This worked well as long as you got the moisture level correct in the kitchen paper and not too wet so that they rotted. My other problem was leaving it too long between checking them; this led to some having relatively large roots which had rooted into the paper. That meant you had to try and pot them up with the least disturbance which was not easy and some roots were broken, though nothing died. So that is one reason why I started sowing the seeds in pots and putting the pots into the fridge. The other reason was really down to time. It is a lot quicker to scan over the top of pots to see if anything has emerged from the gravel topping than looking in-between lots of bits of kitchen paper (this year I sowed 92 pots). The down side to this is you really need a dedicated plant fridge and somewhere to put it.

Having germinated *Fritillaria* seeds in the fridge in pots for a number of years now, one downside I have noticed happens if you leave them too long in the fridge after they have emerged. What happens is that the bulb starts to form on the surface of the compost mix or in the gravel rather than deeper in the pot (see pictures below). I believe that the cooler temperature in the fridge is what causes this.



Fritillaria assyriaca seedling bulb on surface



Fritillaria crassifolia JJA 17242 seedling bulb on surface

I think this because in my mind the depth a bulb puts itself in a pot is all down to temperature and where the conditions seem correct for the bulb. In the pots where this happens it is just the odd one. So I suspect these are the seed that started to grow in the fridge. You may ask what the problem is with a bulb on the surface and not a little or a lot deeper in the pot. Well what I have experienced is that if the bulb does not get large enough (which they often do not) they have a tendency to desiccate in dormancy to a point where they do not come back. This always seems to happen with the hardest of *Fritillaria* seeds to get hold of.

One way I have tried to get round this is I now put all my germinated seedling pots into a polystyrene box when they have gone dormant. I tend to wait for the pots to be fairly dry before putting them in the box with the lid on. This worked quite well but I still had some desiccation so I now put a couple of sheets of damp newspaper in the bottom of the box to raise the humidity of the air in the box but not put moisture in the pots. I would not advise putting pots with damp compost in - these just rot. I have found that even if you do not have any young bulbs on the surface of your compost, doing this still seems to increase survival rates for me. As I have no live growth I stack the pots to get them all in and put the box under the bench.

The benefit of using a fridge is, I think, that I get better germination. I have to admit I have not run any control seed pots to compare germination. But in 2015 our two fridges were full of other things so I could not get my *Fritillaria* seeds in and I did not have a good year for germination even though everything was sown by mid-October. In 2016 I got all my seeds in the fridge including those from 2015 that did not germinate. The 2015 sowings that were important to me that had not



germinated in 2015/16 all germinated for me in the fridge in 2016/17 and all I can put this down to is that they were cool enough for long enough in the fridge. Another benefit, for me at least, is I get a longer first growing season because the seedlings are in leaf growth long before I would normally expect them to be (in subsequent years when they are in the greenhouse the leaves emerge later). The one exception to this is true *Fritillaria karelinii* which germinates and emerges for me from the end of November to very early December in the fridge, but because I water my adult *karelinii* bulbs earlier than most growers seem to, they have usually come through the gravel by mid-November.

I also find I can germinate high altitude *Fritillaria* (when I can get seed) like *Fritillaria alburyana* that some people say they have difficulty germinating. I suspect the problem is they just are not cool enough for long enough if you do not put them in a fridge. The three times I have got seeds that should be *Fritillaria alburyana*, none have made it to flowering yet. This is one *Fritillaria* that I think would have benefited from going into the poly box, so I am only left with one pot - the others all shrivelled to husks. It took 173 to 187 days from sowing to emergence and most of that time was spent in the fridge to get germination and emergence. *Fritillaria minima* took 173 days.

Another surprising thing is just how many of them germinate and emerge in the fridge at 5c; my percentage rate for this happening is currently 45% of all pots.

I will normally start getting seedling emergence in November and these tend to be the American *Fritillaria* or *Fritillaria ariana/gibbosa* or *karelinii*, starting from 33 days after sowing. With hind sight I should have recorded some other information in addition to what I have, such as how long each was outside before I put them in the fridge. If I had done that it would have been very useful; you can be so intelligent with hind sight!

I have to admit I was surprised by *Fritillaria persica* this year; it emerged after 37 days in the fridge on the 06/11/2017. This year I made a note of when they went in the fridge and will most probably add temperature and rain information from records as well. The American *Fritillaria* and *rhinopetalums* started emerging in the fridge on the 19/11/2017, about what I would expect.

I have found an article by S.G. Haw that quotes two methods that Chinese *Fritillaria* farmers use for seed propagation: autumn sowing and spring sowing. The autumn sowing relies

on winter weather to condition the seeds to germinate in the spring. The spring sowing method is interesting because they have to condition the seeds so that they will germinate. This is done by first soaking the seeds overnight in water and then mixing twice the volume of clean moist sand with the seeds (if we could only get that amount of Chinese *Fritillaria* seed) and then keeping them at 5-10°C for three months (93 days). They must not dry out. Then they sow in rows or broadcast and cover to a depth of 1.5cm after the spring thaw. How is this relevant? Well all of the Chinese *Fritillaria* seed I have put through the fridge (11 lots) have taken over 90 days to emerge; most were 118 days or more. So their 93 days in the fridge is very similar to my experience and they should know what they are doing.

So do you need to use a fridge? Well that depends on what is a normal winter for you and if it remains cold enough for long enough. This will also depend on what species of *Fritillaria* seed you are trying to germinate and how long they would expect to be cold. The shortest time in the fridge was 11 days before emerging for me; this was *Fritillaria striata*. The majority of pots will come out of the fridge at the end of February (this year that would actually mean 5 months longer than normal) only leaving high elevation *Fritillaria* or anything I think would get a long winter - these come out at the end of March if they have not emerged already.

Doing all of this is not essential but I find it beneficial.

The Treasures of Tajikistan

Words and images by Bob Wallis

We have spent the last few years exploring the mountains of the central Asian states (or the “Istans” as they are colloquially known). These all became independent of the USSR in the early 1990s and are now much more accessible than in the past. This is a vast area of mainly dry steppe stretching from the Caspian Sea eastwards to the Chinese border and from Afghanistan, northwards to Russia. The areas of greatest interest to us are the main mountain ranges which are a series of more or less east – west running ridges in the eastern part of the countries, largely in Tajikistan (Pamir), Kyrgyzstan (Pamir and Tien Shan) and Kazakhstan (Tien Shan, Dzungarian, Tarbagatay and Altai). The Pamir and Tien Shan ridges also stretch into Uzbekistan. There are some huge peaks, some topping out at over 7000 metres above sea level and this gives rise to a mind-boggling plethora of places to search for fritillaries. Being landlocked, all of these places have a severely continental climate with very cold winters and warm, mainly dry summers. This severity of the climate increases with both latitude and altitude. The mountains get more rain and of course winter snow than the lowland cities.

In the first part of this series of articles we are going to concentrate on Tajikistan. This is a country whose land is 95% over 1500m and more than half is over 3000m. Consequently many places are really remote, exacerbated by the dearth and poor quality of the roads which are difficult to maintain in these conditions. We therefore used 4-wheel drive vehicles for exploration of the flora and went with an AGS Expeditions tour.

We are going to start our searches centred on the city of Kalaikum which is situated in the south of the country, on a

large bend in the Panj River (Oxus in ancient writings) and just about 100m across it from Afghanistan. Although the signpost reads that it is only 285km from the capital, Dushanbe, that is only if one goes across the Khaburabot Pass (3252m) which is closed in winter. The deep Panj river gorge carries the Pamir Highway on a narrow unsurfaced road and it is common to find huge articulated trucks plying their trade along this route having come over two high 4000m plus passes on their way from China. We were not at all surprised to see that they tend to travel in small convoys in case of any problems.

Where the gorge becomes less steep, and in landslides, one can find plenty of flowers, like yellow *Eremurus stenophyllus*, brown *E fusca*, the white and yellow flowered labiate, *Phlomooides speciosa* and fabulous blue *Gentiana olivieri* was everywhere in the open ground between *Lonicera* or *Rosa* shrubs. At this altitude (1500m), *Fritillaria bucharica* was already in advanced seed on May 1st. The beginning of the Khaburabot Pass is a good, unsurfaced road and our vehicles coped with this as if it was an ordinary road. We passed a cliff full of both red and yellow *Tulipa linifolia* and stopped to photograph some superb forms of *Iris bucharica* some of which had deep yellow styles unlike those general in cultivation which sport white styles. We particularly fell in love with the uniformly pale lemon coloured ones. As we approached 2600m, the flowers were well and truly spectacular. *Corydalis ledebouriana* covered one area with a purple haze in a kaleidoscope of colour variations from deep wine purple to white with or without a purple nose. Yellow *Anemone petiolulosa* was everywhere and here were hundreds of *Fritillaria bucharica* in flower. They were on a steep stony slope with lots of snow melt water running through it. The companion plants were white multi-flowered *Tulipa*



Fritillaria bucharica, Khaburabot Pass, N of Kalaikum, 2670m

turkestanica and any broad leaved *Eremurus* just emerging from the ground.



Fritillaria bucharica, Khaburabot Pass, N of Kalaikum, Tadjikistan,
2670m

Our next port of call is the area around Kulob, some 100km or so southwest of Kalaikum. Kulob sits amongst some lower mountains. Nevertheless they have plenty of snow which stimulates the abundant flora into growth as it melts. The speciality here is *Iris rosenbachiana* which is in countless variations from white to deep purple. There are three species of tuberous rooted *Anemone* (*AA petiolulosa* (yellow), *tschernjaewii* (white) and *bucharica* (red)) and wonderful colonies of *Colchicum luteum* with strikingly reddish brown tubes. However we only found a few immature leaves of a

Fritillaria which seemed to be *F. eduardii*. It does grow around here but the flowers are extensively picked for sale and the bulbs are even eaten by the locals so the population is very low in many areas. Once again extensive searching failed to locate any *Fritillaria regelii* which is reported to be around here as well.

The capital of Tajikistan, Dushanbe, is situated in the valley of the Varsob River and it is possible to drive up the excellent asphalt toll road into the Varsob Gorge in about 40 minutes from the city centre. The cliffs on both sides of the gorge are the home of *Dionysia involucrata* and rock ledges are covered in red *Tulipa praestans*. In the most inaccessible cliffs the local people have been unable to pick the flowers and *Fritillaria eduardii* shares the situation with the tulip in a lovely orange and red combination. Further up, the gorge opens out a bit and we stopped to look at the thousands of *Iris vicaria* on a steep stony slope where it was growing amongst the scrub. On climbing a little higher, the slope became much steeper and we had to cling on to the dense scrub in order to work our way up and I noticed a *Fritillaria* climbing its way through an *Acer* shrub, supported by its tendrils and holding ten flower buds in a raceme on its metre high stem. This was clearly *F. olgae* and as we scrambled around trying not to slide down on the ball-bearing-like sand grains, more and more appeared. This is obviously a plant which grows with fierce drainage and a little surface humus from the shrubs through which it climbs. We managed to get back to this spot about a week later in order to photograph the open flowers. Higher still, we found abundant *F. bucharica* by the roadside. Each had 4 – 6 flowers much like those from further south.



Fritillaria olgae, Varsob Gorge, N of Dushanbe, Tadjikistan, 1770

There are a number of smaller gorges which parallel the Varsob and these have some equally good flora. In one of these very near to the Uzbekistan border crossing, we found thousands of *Iris bucharica* in its “typical” white styled form, lots of *Tulipa carinata* and of course *F bucharica* once again.

Sadly we must say good bye to our drivers here as it is now time now to cross the border into neighbouring Uzbekistan and we will continue the story from there.

Bernard Tickner MBE, 24/05/1924 – 07/11/2017

Words by Pat Huff



I last saw Bernard at his 90th birthday celebrations, when this picture was taken. A great gardener and true gentleman, his name lives on in *Fritillaria pyrenaica* ‘Bernard Tickner’ and his legacy in Fullers Mill Gardens outside Bury St Edmunds, which is now in the safe hands of Perennial.



Fritillaria pyrenaica ‘Bernard Tickner’

I had seen his eponymous fritillary growing at Fullers Mill on earlier visits, but by his birthday party it was long over. One of his other great love was lilies, and here are a few that we saw that day.



Lilium 'Eros', one of the famous Chris North hybrids



Lilium 'Lake Tulare' the exquisite Derek Fox hybrid



Lilium leichtlinii



Lilium pardalinum



£3.50

www.fritillaria.org.uk

