



THE
FRITILLARIA
GROUP



The Fritillaria Group of the Alpine Garden Society
Journal 27



Editor: Pat Huff
Botanical advisor: Martyn Rix

The Fritillaria Group welcomes articles, short notes and photographs – especially of plants in the wild—line drawings, and other material concerning Fritillaria.

Copy dates: 1 May and 1 October

Articles are quicker and easier to handle if they are produced electronically, but typed and manuscript copy is also very welcome.

Photographs should be in the form of 35mm transparencies, or on photo CD. If possible, please send transparencies ahead of the copy to allow for scanning. Electronically produced images will only be accepted at a resolution of 300dpi.

The photograph of *Fritillaria alburyana* on the front cover was taken by Pietro Roseo. The back cover shows *F. collina*, taken by Bob Charman.

MEETINGS 2010

AGM and Autumn Meeting
Sunday 26 September 2010
Hillside Events Centre
RHS Garden Wisley, Surrey

P R O G R A M M E

9.00 - 9.30 Coffee

10.00 - Annual General Meeting

11.00 - Lecture - Jon Evans - "Taking better Photos of Flowers"

12.30 - Lunch Break

14.00 - Lecture - Kit Strange - "Growing Frits at Kew"

15.30 – Raffle

16.00 - Close of Meeting

For other information please see our website:

www.fritillaria.org.uk

CONTENTS

Meetings 2010	1
From the Editor	2
The Genus <i>Fritillaria</i> in China: A Summary	3
<i>By Martyn Rix</i>	
A Selection of Plants at the Spring Show	15
<i>By Bob Charman</i>	
The Seed Exchange, by Pat Craven	16
The Cultivation of Eastern Asian Fritillaries	17
<i>By Bob Wallis</i>	
Public Enemy No 1, or The “Crimson Menace”	26
<i>By Pietro Roseo</i>	
FROM THE EDITOR	

川貝母

If you Google “Bei mu” the internet offers you 120,000 entries on the use of fritillary bulbs in traditional Chinese medicine. (The characters above spell “Chuan beimu”, one of six types derived from different members of the genus.) As these beautiful bulbs enter Western horticulture, however, there are only a handful of sources on how to use them as garden plants. In this issue Martyn Rix offers a comprehensive and up-to-date review of the genus in China. Bob Wallis distils recent conversations he had with Bob Charman, Janis Ruksans and Henrik Zetterlund and offers valuable insights into their cultivation at home and abroad. Some are easy-going, some temperamental, and some nigh-on impossible, but your chance of success will be greatly enhanced by the collected wisdom of these four great plantsmen. The greenest fingers in the world still have to contend with the “Crimson Menace”. Pietro Roseo’s comprehensive essay on the dreaded lily beetle gives a history of the beast and stratagems to deal with it.

This issue has been unavoidably delayed, so turn to p 16 at once to take part in this year’s seed exchange, organised by Pat Craven.

THE GENUS *FRITILLARIA* IN CHINA: A SUMMARY

By Martyn Rix. Images supplied by Bob Charman.

INTRODUCTION

China covers as much area as Europe and Turkey combined, and from tropical to almost arctic climates at sea level, to the highest mountains in the world, and from desert to rainforest, so it is not surprising that it contains a lot of different plant species. What is rather surprising is that there are so many *Fritillaria* species, when *Fritillaria* are primarily Mediterranean bulbs, and it is in Mediterranean climates such as Turkey and California where they have reached their maximum diversity.

The *Flora of China*, which takes a rather conservative view of the number of species, covers 24 species; for comparison, *Flora of Turkey* contains 31 species and several subspecies, and a few more have been described since the account was written.

Links for the Chinese Flora online are:

<http://flora.huh.harvard.edu/china/PDF/PDF24/fritillaria.pdf>
http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=113029

This outline is based on the Flora, with some modifications and explanations.

http://fritillariaicones.com/info/names/pub_names_a.html

One great difficulty in the study of the Chinese species is that they are often very difficult to find in the wild; this is because they have been exterminated in the more accessible areas by collectors of medicinal plants. Fritillary bulbs, called in Chinese, Bei Mu, are one of the most popular Chinese traditional medicines. All the species seem to be used, and seem to have much the same properties, to soothe the throat and lungs, and to lessen spasm. Coughs and colds are one of the chief ailments over large parts of China, and until recently most of the major cities were desperately polluted by the burning of very sulphurous coal. In Chengdu in the 1980s there were very few cars, but about a

million bicycles, and even then to breathe the open air was to cough...now there are a million cars and the air is cleaner.
Medicinally Chinese Fritillaria are divided into six main groups:

Zhe beimu from cultivated *F. thunbergii*.

Yi beimu from *Fritillaria walujewii* and *F. pallidiflora* from Xinjiang.

Ping beimu from *Fritillaria ussuriensis* from NE China.

Chuan beimu from *Fritillaria cirrhosa*, *F. sichuanica*, *F. unibracteata* and *F. przewalskii* from Yunnan and the Himalayas.

Hubei beimu from *Fritillaria hupehensis*.

Anhui beimu from *Fritillaria anhuiensis*.

Many new species have been described from central China, by workers who were cultivating and studying local *Fritillaria* for medicinal purposes, and this accounts for some of the large numbers of synonyms listed under some species such as *F. monantha*. Other workers, such as the Duans have described lots of varieties, which are not recognised by the flora and are listed as synonyms. When their specimens have been studied in more detail, I expect that more of their varieties will achieve wider recognition.

Mr and Mrs Duan, their collections in the wild and their fritillary farm in the mountains of Xinjiang, are described in more detail in *Curtis's Botanical Magazine* vol. 26, parts 1 & 2 (2009), under *Fritillaria yuminensis*. This article covers Chinese medicinal fritillaries in general, and the work done by Christine Leon at the Chinese Medicinal Plants Authentication Centre (CMPAC), based at Kew.

For convenience and botanically too, we can divide China into four areas. Recent DNA studies at Kew indicate that the species have evolved relatively recently, and that most of the geographical groups are also related biologically. Similarities in flower shape have evolved several times in response to similar

pollinators, such as bumble bees, solitary bees or dung flies. This is particularly striking in the Japanese species, recently covered in a Fritillaria Group lecture by Laurence Hill.

In contrast to this, one or two species and groups are very isolated: *Fritillaria davidii* is not closely related to any other species, and *F. karelinii*, which just reaches Chinese territory in western Xinjiang, is related to the other species of subgenus Rhinopetalum, which are found from Iran eastwards.

The species may be grouped as follows (numbers from *Flora of China* are in brackets):

XINJIANG

Here there has been a remarkable diversification of species in a very small area, particularly in the mountains along the border with Kazakhstan. Around 10 species are recorded, and more are still being discovered, particularly by the Duans, who described *Fritillaria yuminensis*, *tortifolia* and *albidiflora*:

Fritillaria karelinii (Fischer ex D. Don) Baker (21). Deserts, *Artemisia* scrub, saline clay soils; from north of the Caspian to northwestern Xinjiang. Short upright stems with up to 10 (rarely more) starry pink spotted flowers. Capsules not winged.

Fritillaria meleagroides Patrin ex Schult. (2). Dryish places in bogs and moist steppes, in peaty soils; from Romania and southern Russia, across Siberia to northwestern Xinjiang. Tall stems, nodding at the top, with narrow leaves and a solitary blackish or yellow rounded flower. Capsules not winged.

Fritillaria ruthenica Wikstr. In thickets and rough, grassy places. From southern Ukraine, eastwards to Kazakhstan, on the border with western Xinjiang, so may be in China, too. Tall stems with the upper leaves in a whorl of 3, forming tendrils. Flowers

blackish, heavily tessellated, with a linear nectary. Capsules winged.

Fritillaria pallidiflora Schrenk ex Fischer & C. A. Meyer, (1). Alpine meadows, margins of *Picea schrenkiana* forest and *Juniperus* scrub in the mountains, 1300–2500 m, in peaty and loamy soils, from Kazakhstan in the Dzungarian Ala-tau to the Borohoroshan in western Xinjiang; commonly cultivated for medicine. Broad alternate leaves and one to several very large pale green or yellowish, squarish flowers, lightly tessellated with red. Capsules winged.

Fritillaria verticillata Willd. (11). Alpine meadows and scrub, in dryish peaty soils, in the Altai in Russia, Mongolia and Kazakhstan, just extending into northern Xinjiang. Narrow opposite or whorled leaves and usually a large solitary pure white squarish flower. (This is the form which Janis Ruksans calls ‘Urdzhar’.)

Fritillaria tortifolia X. Z. Duan & X. J. Chen (13). Dry scrubby and grassy hills, with *Paeonia anomala*, *Primula veris* var. *macrocalyx*, *Corydalis nobilis* etc in stony loam, in Xinjiang south of Yumin. Lowest leaves opposite, c. 15mm wide, the rest usually paired or in a whorl of three; flowers very broad, white, tessellated with crimson, especially inside. Capsules winged.

Fritillaria yuminensis X. Z. Duan (15). Dry scrubby hills, with *Juniperus* etc. in dry, peaty loam, in Xinjiang south of Yumin. Lowest leaves opposite, c. 10mm wide, the rest usually paired or in a whorl of three; flowers almost flat to bell-shaped, pale pink or mauve, not tessellated; nectary inconspicuous; style undivided. Capsules winged.

Fritillaria albiflora X. Z. Duan & X. I. Chen. Very dry, scrubby hills, often among *Artemisa*. In Xinjiang, in the Tar Bagatay mountains near Tacheng, Emin and Tuoli. Lowest leaves opposite, c. 10mm wide, the rest usually paired or in a whorl of



Fritillaria karelinii



Fritillaria yuminensis



Fritillaria pallidiflora

three; flowers almost flat, white; nectary conspicuous, 3 mm above the tepal base; style divided at the apex for c. 3mm. Capsules winged. ('Kara-Sumbi' is similar to this, but has more angled flowers, in which the lower part of the tepal is somewhat reflexed and the nectary is probably deeply indented. It was found in eastern Kazakhstan.)



Fritillaria ferganensis

Fritillaria walujewii Regel (10). Dry grassy slopes in the mountains and in juniper bushes. From Uzbekistan to western Xinjiang above Urumuchi in the Tien Shan. Lowest leaves opposite, the rest whorled, the upper ones curled; flowers large, square, greyish outside, heavily tessellated dark red inside; nectary narrow, deeply indented.

Fritillaria ferganensis A. Los. Rocky screes and steep mossy slopes on limestone and in scrub. Uzbekistan, Pamir-Alai; in the Turkestanskiy range west of Tashkent, in the Alayskiy range south of Ferghana, and in the Zaalayskiy range on the border with Tadzhikistan, growing on shady rock ledges on limestone and in scrub. Recorded from China, in the region of Kashgar. Lowest leaves opposite, the rest whorled, the upper ones curled; flowers square, greenish outside, tessellated with pink; nectary large 6-8 x 3 mm and shallow, not deeply indented.

Fritillaria thunbergii Miq (12). Rocky slopes? Widely cultivated for medicine; probably native in the Tar Bagatai mountains in north-east Kazakhstan on the border between Kazakhstan and Xinjiang; found wild and probably an escape from cultivation in Japan and in E. China in Anhui, Jiangsu and Zhejiang, below 600m, in bamboo forests, shady and moist places. Lowest leaves opposite, the rest opposite or whorled, the upper ones curled; flowers small, rounded, bell-shaped, creamy-yellow with green veins. Nectary narrow, 3-4mm long, forming a groove.

MANCHURIA AND NORTHEAST CHINA, INCLUDING EASTERN SIBERIA

Four species, very different from one another. Is *F. camschatcensis* the link between the Asiatic and American species, or was there an earlier migration of a *dagana*-like species?.

Fritillaria maximowiczii Freyn (23). Broad-leaved deciduous forests, moist and sandy places on forest margins, thickets, grassy slopes; 1400–1500 m. Hebei, Heilongjiang, Jilin, Liaoning. Bulb of several small scales. Leaves in a basal whorl of 3 to 6, usually 5, with 1 bract leaf. Flowers large, solitary, purplish, heavily tessellated, the margins of the petals irregularly fimbriated.

Fritillaria dagana Turcz. ex Trautv. Alpine meadows near Lake Baikal: (not known from China at present). Bulb of several, c.6, small scales and with stolons. Leaves in a basal whorl of 3, with 1 bract leaf. Flower rather small, greenish tessellated with brownish-purple.

Fritillaria camschatcensis (L.) Ker-Gawl. Meadows, bogs, streamsides; from eastern Siberia and Japan along the Kurile Islands to Alaska. Bulb of several scales on a solid base, with numerous rice grains. Leaves whorled. Flowers often several in an umbel, green, very heavily tessellated with black (or yellowish), with numerous parallel ridges from base to apex.

Fritillaria ussuriensis Maxim. Ex Trautv. (14).

Forests, thickets, meadows, streamsides, shady and moist places along the Ussuri river; near sea level to 500 m. Heilongjiang, Jilin, Liaoning, eastern Siberia, Korea. Leaves 14 – 17, very narrow, the upper coiled on an extension above the flowers. Flowers square, very heavily tessellated, appearing blackish. Capsule not winged.



Fritillaria dagana



Fritillaria ussuriensis

THE CENTRAL MOUNTAINS, EAST AND NORTH OF THE SICHUAN PLAIN

This can be thought of as old China, containing the cities of Xian, Wuhan, Nanjing. Four species:

Fritillaria anhuiensis S. C. Chen & S. F. Yin (22). Forests, thickets, grassy slopes; 600–900 m. Anhui, Henan. Dabeishan. Bamboo forests, shady and moist places; near sea level to 600 m. Anhui, Jiangsu, Zhejiang. Loosely scaled bulbs with many smaller, rice-grain bubbles inside. The stems tall, the rather broad leaves usually in whorls; the flowers 3–5 cm long, are purple and white tessellated or sometimes all white or all purple. Nectary conspicuous, deeply indented.

Fritillaria thunbergii var *chekiangensis* (12b). C. Zhejiang (Dongyang Xian). Cultivated in Zhejiang for its bulbs, which are used medicinally. Smaller than the usual *thunbergii*, with 3-scaled bulbs, shorter stem, less than 30 cm, and leaves mostly opposite.

Fritillaria taipaiensis P. Y. Li (5). Hill thickets, grassy slopes; 2000–3200 m. Gansu, Hubei, Shaan-xi, Sichuan. Leaves many, opposite or whorled, the uppermost curved but not coiled; flowers 2.5 – 5 cm long, yellowish-green, irregularly blotched and mottled with purple-brown rather than tessellated.

Fritillaria monantha Migo (9). Forests, moist places on limestone hills, flood lands; 100–1600 m. Anhui, Henan, Hubei, Jiangxi, Sichuan, Zhejiang. Very leafy plant, leaves whorled, the uppermost sometimes coiled. Flowers large, narrowly bell-shaped, square at the base, tessellated with purple or brownish; nectary large and projecting; style with long branches, 3 – 8 mm long

SOUTHWEST CHINA

This has a Himalayan flora, which goes north into Sichuan and Gansu west of the Sichuan plain. Eleven species: it is still not clear how distinct some of these species are: in the case of the species close to *F. cirrhosa*, the flowers seem to get smaller and narrower towards the north and west, ending in the deserts of Qinghai.

Fritillaria fusca Turrill (20). Moist and gravelly places, open flood lands; 5000–5100 m. S Xizang, north of Llasa. A very small, broad-leaved plant with blackish flowers.

Fritillaria delavayi Franchet syn. *F. bhutanica* Turrill (19). Sandy and gravelly places, flood lands; 3400–5600 m. Qinghai, Sichuan, Xizang, Yunnan, Bhutan, Sikkim. Short stems with overlapping, broad, greyish leaves; greyish, rounded flowers, slightly tessellated inside: recorded from Bai Ma Shan and from Lijiang.



Fritillaria delavayi

Fritillaria sinica S. C. Chen (8). Open thickets, hill grasslands; 3400–3600 m. W Sichuan; on Erlang Shan. Short stems to 30cm, with few (3-8) leaves, mostly opposite. Flower solitary, tessellated, like *F. latifolia*.

Fritillaria dajinensis S. C. Chen (18), syn *F. lixianensis* Y. K. Yang & J. K. Wu. Thickets, meadows; 3600–4400 m. NW Sichuan. Flower yellowish-green, dark spotted near the base, very narrowly campanulate; style undivided. (Flower like *F. ehrhartii*.)

Fritillaria crassicaulis S. C . Chen, syn. *F. omeiensis* S. C. Chen (7). Forests, bamboo thickets, alpine grasslands; 2500–3400 m. SW Sichuan (Mt Omei), NW Yunnan (Zhondian plateau, Lijiang). Leafy plants with 10 to 18 lanceolate leaves in 3 or 4 whorls of 3 to 6. Flowers large to 5.5 cm, green, tessellated with brown (Yunnan), or yellow, lightly tessellated (Sichuan).

Fritillaria cirrhosa D. Don (4). Forests, alpine thickets, meadows, flood lands, moist places; 3200–4600 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan. Leaves narrow, the upper in a whorl of 3, coiled at the tips. Flowers green or yellowish, tessellated with brown, sometimes very heavily tessellated so as to appear black, sometimes all pale yellow. Nectary usually ovate, 2 – 5 mm long.

Fritillaria sichuanica S. C. Chen, syn. *F. cirrhosa* var *ecirrhosa* Franch. (3). Hill thickets, grassy slopes; 2000–4000 m. S Gansu, S Qinghai, W Sichuan. Similar to *F. cirrhosa*, but with slightly smaller, narrower flowers and upper leaves usually solitary, without coiled tips. Nectary 4 mm long, 2 mm wide, tear-shaped.

Fritillaria yuzhongensis G. D. Yu & Y. S. Zhou (6). Grassy slopes; 1800–3500 m. Gansu, Henan, Ningxia, Shaanxi, Shanxi. Very similar to *F. cirrhosa*, but with slightly smaller (2-4 cm), usually yellowish-green flowers; nectary round, 2mm across.

Fritillaria unibracteata P. K. Hsiao & K. C. Hsia (17a). Thickets, meadows; 3200–4700 m. S Gansu, SE Qinghai, NW Sichuan. Similar to *F. przwalskii*, but flowers small, blackish; sometimes grows with *F. przwalskii*, but sometimes they are in separate populations.

var. *longinectaria* (17b) Thickets, meadows; 3200–4700 m. NW Sichuan. Chang xian. Differs in having a very long, narrow nectary, 6–11 cm long, deeply impressed.

Fritillaria przwalskii (16) Thickets, grasslands; 2800–4400 m. S Gansu, E Qinghai, NW Sichuan (above Woolong). Leaves narrow, all alternate. Flowers yellow, slightly tessellated, narrow bell-shaped; style divided at apex for 1 mm. Nectary small.

Fritillaria davidii Franchet (24) *Betula alnoides* forests, grassy slopes, loose peaty soil with ferns, rocky moist places along streams, mossy cliff ledges; 1600–2600 m. W Sichuan. Bulb solid, with numerous rice-grains. Leaves growing direct from bulb in autumn, flowering in spring; stem leafless except for 1 or 2 small bracts. Flowers large, purplish-red at the base, yellow at the apex, regularly scattered with fat glands. Nectary small and round; capsules unknown.



Fritillaria unibracteata

A SELECTION OF PLANTS AT THE SPRING SHOW

Words and images by Bob Charman



Top Row: *Fritillaria ariana*; *F. uva-vulpis* (? A very unusual form, unlike those you can buy in any garden centre in the UK); *F. striata*.

Middle Row: *Fritillaria latifolia*; *F. aurea*

Bottom Row: *Fritillaria walujewii* (This plant is also offered under the names *pingwuensis*, *yuzhongensis* and *monantha*, but is it any of these?); *F. gibbosa*; *F. sewerzowii*.

THE SEED EXCHANGE

The 2009 seed exchange was quite encouraging – the number of donations and their variety were significantly up on 2008. Requests for seed were also higher, presumably in response to the greater variety on the list, and the exchange made a significant contribution to the Group's funds. With luck, the later season this year may mean there are more pollinators abroad and result in better seed set. In any case, please do donate as much seed or bulblets as you can. And please try to separate any chaff from viable seed – having to clean seed as well as pack it increases the work enormously, and I don't want to send out material that isn't viable.

The majority of participants in the seed exchange now have email, and I send out the list to all members for whom I have an email address. Again, a printed list will be sent **only to those members who request one**. So please:

- Ensure that I have your up to date email address
- If you want a printed list, write or telephone to request one.

There is generally no way of knowing that an email has gone astray (or a letter, for that matter). I expect to send out this year's list by post on Saturday 29th August, and to send the email lists out on Monday 31st August. If you don't get your list in the week commencing 30st August, please let me know. In order to make the timings work, **please send all donations to reach me by Wednesday 25th August.**

Some members (even when they request bulblets) still send an ordinary envelope with inadequate stamps, or else send no s.a.e. at all. Please send padded envelopes with the correct postage.

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CULTIVATION OF EASTERN ASIAN FRITILLARIES

Words and images by Bob Wallis

Bob Charman and Bob Wallis interviewed Henrik Zetterlund and Janis Ruksans, two of the most successful growers of these plants, and report their discussions. Henrik is responsible for their cultivation in Gothenburg Botanic Garden, Gothenburg, Sweden and Janis grows them in his nursery near Cesis in Latvia. The two Bobs also try to grow some of these plants in west Wales and southeast England respectively. Our experiences are somewhat different so before we all go and change all our growing conditions, we should recognise that all four of us in this conversation, live in quite different climates. For this reason it is useful to compare where we all reside and grow our fritillaries. I have found average climate data for the nearest weather stations and it does show that the two major contributors to this article live in a much more continental climate zone than the two Bobs. There are much lower winter temperatures and much more consistently cold winters than our markedly maritime climate with its variable winter temperatures. I should also add that the reason that we asked Janis and Henrik is that they grow these plants much better than we do. Is that purely because of the climate? I doubt that! They are both extremely skilled growers who have the backing of many years of practical experience.

	Average winter low to average summer high temperature (°C)	Average Annual Rainfall (mm)	Days of air frost
Gothenburg	-4 to 21	670	84
Riga	-10 to 22	566	
Wisley	1.5 to 22.5	647	47.4
Trawscoed	2 to 20	1214	48.4

So we discussed each of the species in turn and this is the summary of the result.

Fritillaria pallidiflora

This is one of the easiest of the eastern Asians and likes cool conditions. In Gothenburg, it grows well outside in the Asiatic peat garden. It is mulched in the spring with good soil but is never fed with fertiliser. In this area the peat walls are naturally more acid than the back of the bed but the fritillary does not seem to have any preference. Henrik commented that it also grows well on limey soil.

In Latvia, Janis grows this species outside in the natural soil with added peat moss and sand. The land is ridged and the bulbs are planted 7 - 10 cm deep in a pocket of sand on the ridge. The whole field is then covered with a 10 cm layer of peat moss which helps to insulate the bulbs from the winter cold. In contrast to practice in Gothenburg, Janis feeds twice a year. In early spring, as soon as he is able to walk on the field, he uses ammonium nitrate to obviate the nitrogen deficiency which arises in the very cold climate. Later in the spring he favours a slow release, high potash feed such as 10:10:18 plus trace elements at 50 g/m². Every 3 years he also uses dolomitic lime to bring the pH up to pH 6 – 7.

Fritillaria camschatcensis

Like *F. pallidiflora*, this also grows easily in a peat bed in both Gothenburg and Latvia but it seems to need some shading in the summer.

Janis commented that he finds it very difficult to store the bulbs when he lifts them for market. They go mouldy if they are too wet and dry out if too dry. So I guess that the answer is to leave them alone as much as possible. In addition, some have very brittle bulbs (e.g. the dwarf Japanese form) making them difficult

to handle. Others have much more robust bulbs such as ‘flore plena’, the Canadians and some of the Siberian forms.

I had heard that *F camschatcensis* does better if the bulbs are planted shallowly in the soil but neither Janis nor Henrik had experienced this.

Fritillaria meleagroides

This species seems to be as easy to grow outside as *F meleagris* in both Gothenburg and Latvia.

Fritillaria dagana

This species makes very long thin stolons which can be as much as 10 cm long. If these are broken off in their first year then they will not grow. Yet again, therefore, this is a difficult species to handle and is probably best left undisturbed. In Latvia, Janis leaves them in the ground for two years before lifting for sale. He added later (29th June): “I just harvested potted plants which were quite dry, but after replanting, I watered them and will water 1-2 times during rest of summer. In plastic pots soil dries out very slowly”. In Gothenburg it is grown in pots which are kept slightly moist by being plunged in damp sand through the summer. It is very late in starting growth in the winter and in order to ensure that it stays cool in winter, the pots are plunged outside in part shade but no water is given until they commence growth.

Fritillaria maximomiczii

This has been mixed up with *F ussuriensis* by one of the Chinese nurseries so it is not as common in cultivation as the labels suggest! The bulbs are also very like its co-grower, *Lilium maximowiczii* and sometimes the lily has been supplied in error.

Both Gothenburg and Latvia grow this species in the same way as *F. dagana* except that, since it comes from peaty areas, it can be a bit moister.



Fritillaria maximowiczii

Fritillaria ussuriensis

Both Henrik and Janis have found this species quite tricky to grow. Gothenburg have no stock now but when they did it was grown as *F. dagana*. It needs some support to grow because it has very thin weak stems which require something to lean on. In nature it grows amongst shrubs.

In Latvia, Janis found that it abhors pots so he grows it outside in the same conditions as *F. dagana*. Although it makes many rice

grain-like bulbils, these do not seem to grow on like other species so it is propagated by seed which germinates very well.

Fritillaria thunbergii

Some clones of this species have been in cultivation for several decades and it grows easily outside in a woodland bed and flowers somewhat sporadically. In Wales we have had plants for a long time and we always get some flowers but nothing compared to the number of non-flowering bulbs in the clump. Recently another clone came into Europe from Chen Yi in China. This one has been a revelation. It multiplies very rapidly and virtually every bulb flowers. Both Henrik and Janis find this to be easy in both pots and outside. What is more, unlike the older clones, it can be lifted and kept dry for a short time in summer. We have grown the Chen Yi clone and had some fantastic potsful of blooms but one year it failed to grow and the bulbs dwindled. We think this was because it got too hot and dry in the summer of 2007. It has been slow to build back up again.

Fritillaria verticillata, tortifolia, olgae and yuminensis

These species all come from areas which have a very cold winter and a dry summer. In Gothenburg, they are grown in pots in the same way as all the other dry growers from western Asia so they get a dry summer and are started into growth in early autumn. The cold winter seems to give them another dormancy period when they can be kept a bit drier although not too dry or the buds abort. The only problem comes from the fact that they tend to root very early in the summer. In fact *F olgae* is already rooting as the seed is maturing from the previous season. Both Janis and Henrik advised that they probably do not want too much disturbance so repotting should be done early in the summer or with minimum disturbance of the bulbs.

Janis's 'Urdzhar' form of *F verticillata*, and *F olgae* are much easier to grow than the others in Latvia where they can be grown

either outside in the field or in pots. They seem quite happy kept dry in open boxes during the summer. The 'Karasumbe' form of *F. verticillata* seems to be somewhat more difficult.



Two forms of *Fritillaria olgae*

Janis finds *FF tortifolia* and especially *yuminensis*, more difficult although he does get a seed set on *F. tortifolia*. In contrast, in Wales, we find these to be the easier ones although they do not seem to multiply naturally or set seed and we have not had the courage to split the bulbs. We grow them in pots in what we call our warm shade house, and do not disturb the bulbs other than to top dress them with new compost down to the bulbs every other summer. They do seem to have appreciated the last two cold winters.



Fritillaria tortifolia

Fritillaria regelii

Neither Janis nor Henrik have had this species. It looks a bit like *F. unibracteata* but has very small bulbs and possesses tendrils for support.

Fritillaria unibracteata

Janis has a few bulbs of this which come into growth very late in the spring. He keeps it in pots which are plunged outside in summer time to keep them cool. They are covered if it gets rainy. Apparently a lot of stock has a fungal disease characterised by black specks on the bulb. Janis added in June: "I just replanted 190 bulbs of it in 3 boxes, now stocks look like they have recovered. I got this under 5 or 6 different names, so finally the total number is quite large, but it has one of smallest bulbs - flowering size is 7-10 mm in diameter."

Fritillaria delavayi

This is a monsoon species which is late into growth and needs to be kept moist in the summer. In Gothenburg it is grown in the alpine house together with species like the Caucasian meadow plants *FF collina*, *latifolia* and *F maximowiczii*.

Janis obtained this under *F fusca* about 10 years ago and it only flowered for the first time last year. He found that it needs very gritty soil and then it grows well if the pot is kept outside all summer and not allowed to dry out. Janis just obtained true *F fusca* now and it seems to like same conditions as *F delavayi*. He adds: "both have quite different leaves and both like great portion of grit in soil mix."

Fritillaria cirrhosa and *roylei*

Gothenburg treats these like a lily where they are planted in the garden in the lily bed in part shade of some small shrubs through which it twines. Similarly Janis grows *F cirrhosa* in the garden in part shade as he finds them very difficult in pots.

Fritillaria davidii

Bob and Rannveig Wallis were the grateful recipients of the generous offer of some bulbs of this species from Martyn Rix about 12 years ago and experimented with them until we found conditions that they liked. Now we grow them in pots in a woodland compost (John Innes No 2: oak leafmould: coarse perlite. 1:1:1) which are kept outside in the shade during the summer and fairly moist. The leaves appear in October and at this time, in order to avoid the attentions of the mollusc population which adores this autumnal *hors d'oeuvre*, they are brought into our warm shade house, (which, by this time, has had the shading removed so it is in full winter sun) where they spend the winter. They receive occasional liquid feeding with half

strength tomato fertiliser until they go dormant. We find that they stay in growth a bit longer if they are removed from the greenhouse in about March and placed in the shade outside. Hopefully the leaves then keep feeding the bulbs for next year. They are repotted in May or June to allow plenty of time for root growth during the summer.

The best we have ever done is 25 flowers in a 25 cm pot. Recently they have stopped flowering for us and this has coincided with two very cold wet summers. On inspection, the central mother bulbs have rotted leaving a lot of much smaller daughter bulbs which we are growing on now. So they may appreciate a little less of the recent Welsh monsoons in the cold summers. This winter was exceptionally cold and we did notice some damage to the leaves although they were not killed unlike many of our Cyclamen this year. Janis has noticed similar sensitivity of the leaves to hard frost.

Conclusion

The eastern Asian fritillaries do not fall nicely into groups so their cultivation seems to be quite specific for the species depending on the conditions where they come from. In this article we have tried to summarise the most recent information from some very expert growers but even they have failures so if anyone reading this has anything to add, please get in touch with our editor or one of the two Bobs.

PUBLIC EMEMY NUMBER ONE OR THE “CRIMSON MENACE”

By Pietro Roseo

How many times have you gone down the garden to find your prize *Fritillaria* leaves or flowers munched away, seeming at first by an unknown assassin? Did you later find the little scarlet terror hidden among the foliage smiling back at you; or sitting on the plant bold as brass? When you tried to remove it, did the little pest drop to the ground, disappearing without a trace? I’m sure you know what I’m talking about- yes the dreaded Lily Beetle! (*Lilioceris liliii*)! If you haven’t encountered the adult, then it’s normally the sticky orange-black grubs, which look most unsightly.

It never ceases to amaze me, that no matter where wild *Fritillaria* are encountered, for example, in Turkey, Greece and the adjoining islands, and Iran, this little menace is very common. Lily beetles appear everywhere, from lowland to the coldest of areas in the mountains, even near the snow line. I think the only *Fritillaria* I have not observed them on in the wild is *F. gibbosa*, presumably because it inhabits semi desert areas which do not suit the beetle’s requirements .It may seem a bit strange, but I thought it was about time this much maligned pest and pioneer was given some coverage in our journal.

Well, firstly, how do you identify it as a Lily Beetle? The adult is about 8mm long with a red thorax and wing cases, and jet black head and legs. Its Latin name, rather appropriately, is *Lilioceris liliii*. There are a number of similar looking beetles which are garden friendly, namely, the Cardinal Beetle (*Pyrochroa coccinea*) and Soldier Beetle (*Pyrochroa serraticornis*) which resemble the Lily Beetle, but are much larger, and members of the Soldier Beetle family. They are slimmer and have a black bar at the bottom of the wing cases near the abdomen. These species tend to be a more orangey red than scarlet red. Neither of these poses any threat to plants.



Lilioceris liliii and its prey
(above); Cardinal Beetle (top right) and Soldier Beetle (bottom right).

The larvae of the Lily Beetle are a dirty orange in colour and are up to 10mm long. They look quite disgusting, usually smothered in their own slimy black excreta which helps to protect them from predators like birds or parasitic wasps. In fact, they resemble sticky bird droppings. The adult beetles emerge in the spring as temperatures warm up, and begin feeding; not just *Fritillaria* but also on *Cardiocrinum* and all other *Lilium* species. They then mate and lay eggs on the leaves of the chosen plant. Eggs are reddish orange and laid on the underside of the leaves. Unfortunately for us, each female can lay up to 300 eggs at a time! After about a week – Yes, believe it or not a week! – the eggs hatch. The larvae then feed for between 16 and 24 days before pupating. It remains in the pupal stage in the soil, generally

below the chosen plant, for about 3 weeks before the cycle starts again. There is generally only one generation a year; however all stages of the beetle's life cycle may be encountered throughout the summer months.

Lily Beetle is a native of Eurasia, and was first reported as an occasional visitor to the UK before 1900. It was not until 1939, however, that a colony was discovered in Chobham, Surrey, which indicated that the species had grained a foothold in Britain. At the beginning it spread slowly and was not considered a serious threat. In the first 20 years it was restricted to Surrey and adjacent counties. It remained confined to this small area for three decades before it began its march across the country. By the late 1980s it was a serious problem across much of southeast England. Over the past two decades the insect's conquest of the UK has accelerated, possibly due to global warming and mild winters. By 2000 it was now found in nearly all the Southern counties and was being reported as far north as Cheshire and Lincolnshire. It was not until 2002 that Lily Beetle was reported in Scotland (Glasgow) and Northern Ireland (Belfast) for the first time, and is now spreading in these locations.

The most important question on everyone's lips is - how to control the "crimson menace"? Lily Beetle can be controlled by removing them by hand and squashing them, or giving them the flat part of the "order of the boot!" This is the environmentally friendly way, but not the most effective. Plants can be treated as per manufacturer's instructions with various insecticides such as Pry Spray Garden Insect Killer, Bayer Provado Ultimate Bug Killer, Scotts Bug Clear Ultra Gun, Bayer Sprayday Greenfly Killer, or a Bifenthrin based spray such as Doff All in One Garden Pest Killer.

It may seem a little strange, but I like seeing *Fritillaria* in the wild along with The Lily Beetle. There's something comforting in seeing an old friend - or enemy as the case may be – even if it is the "Crimson Menace!"



£3.50

