Crocus Group Bulletin No 9.

Hon. Secretary's Notes

Crocus Lecture 6pm Tuesday 17th March 30p.

To be given by Brian Mathew & followed by a Quick Fire Crocus Corms, in aid of the Crocus Group funds. PLEASE SUPPORT THIS.

The talk will have no special theme but will be rather a miscellany of Crocus information. I would like to pick out some of the gaps in our knowledge of the species and suggest how people might assist in building up the pool of information — both in the wild and in cultivation. Those who do not have the opportunity to travel in search of plants can contribute in other ways — by finding out which species will hybridise, for instance, since this might tell us something about relationships within the genus. Although my Crocus monograph is now finished this certainly does not mean that we know everything about them — far from it! But people do need something up-to-date to use so that they can find out the places where knowledge is poor. I will give more details of the book during the talk.

European Crocus Species

Brian Mathew

There are 43 species of crocus represented in Europe as defined by Flora Europaea, which excludes the east Aegean Islands. Of course the problem of what is a 'good' species arises and in a few cases there is still insufficient knowledge available to reach a decision, as with for example C. pallidus from Yugoslavia.

The 43 can be divided into several groups which I will be calling Series in the monograph to be published later this year. Some of these contain only one or two species with no near relatives, for example C. fleischeri and C. banaticus. The Series are defined by a number of features, not necessarily just the outward appearance but taking into consideration cytology, anatomy, ecology, seed surface etc., and particularly the features of spathes and bracts.

The largest groups in Europe are the (1) reticulate-tunic ones related to C. reticulatus and C. sieberi (mainly eastern Europe), (2) those with very conspicuously striped flowers, often with parallel-fibrous tunics - C. imperati and its kin (mainly central Europe), (3) the mainly autumn-flowering ones related to C. nudiflorus - this group is less clearly defined and is more widespread, (4) the Saffron group, C. cartwrightianus and its allies (5) C. laevigatus and its allies (6) C. vernus and its allies, (7) C. biflorus and its allies. In addition there are a few groups containing few (2 or less) members in Europe.

Dealing with these in the order given I will list the species in each but not go in to all the tedious details of the group characters. Distributions mentioned only relate to that part which falls within Europe; some species occur outside Europe as well.

GROUP 1. C. reticulatus, C. angustifolius (C. susianus), C. dalmaticus, C. sieberi, C. veluchensis, C. cvijicii, C. robertianus, C. cancellatus

C. reticulatus occurs from around Trieste in Italy eastwards through the Balkans to the Crimea. It is quite variable with white or lilac flowers, usually with 3 conspicuous stripes on the outside, with or without a yellow throat, and often with rather pointed segments. I do not find it an easy one to grow but the Crimean forms are the most vigorous with larger flowers. C. angustifolius occurs only in the Crimea and is very similar except for its yellow flowers. These also have stripes on the outside, sometimes these merging to give a beautiful mahogany-bronze exterior. It is of course better known as C. susianus but this is a later name and must become a synonym. C. dalmaticus grows along the Adriatic coastal mountains of Yugoslavia into Albania. It is normally lilac-blue with a fawn coloured exterior but the variation, even within one small colony, can be enormous from pale lilac to deep rich lilac-purple and washed on the outside with silvery grey through to a lovely gold colour. The form sold by nurserymen is a very mediocre one in colour, but is a vigorous garden plant.

C. sieberi is even more variable but here the major variants fall into geographical groups. The plant originally described as C. sieberi was collected on Crete so this form, which is white on the inside and variously marked with purple bands or zones on the outside, must be regarded as the typical form and the mainland ones variants of it. The wholly lilac-blue one which occurs on the hills and mountains around Athens is atticus. C. sieberi in one form or another occurs all over Greece and into southern Yugoslavia, Albania and Bulgaria. It overlaps in its distribution on the Greek mainland with C. veluchensis and where populations of the two occur together they hybridise - for example on Mt. Peristeri, Mt. Chortiatis and Mt. Parnassus. It is usually possible to distinguish between them because of the yellow throat of C. sieberi and white throat of C. veluchensis, and there is a subtle flower shape difference. C. veluchensis is also extremely variable, ranging from tiny pale lilac alpine forms with narrow leaves to huge deep violet ones with broad leaves (and with everything in between). The latter ones are by far the best garden plants.

Closely related to C. veluchensis is C. cvijicii which occurs on several mountain ranges in southern Yugoslavia, Albania and northern Greece. This is creamy or yellow-flowered, sometimes with a purple perianth tube. In cultivation it seems to be relatively easy to grow and is a fine alpine house plant.

The autumn-flowering members of this group are C. robertianus and C. cancellatus, the first being related to C. sieberi in its general structure and, in turn, the second is related to C. robertianus. At first it was thought that C. robertianus was confined to the northern Pindus Mts. but recently Richard Nutt has collected it on the mountains north of the Gulf of Patras. It is a very fine autumn Crocus with large lilac-purple flowers with a frilly orange stigma. There are no leaves visible at flowering time and, when they do develop, are wide and green, not narrow and grey like those of C. cancellatus.

C. cancellatus is widespread and variable, occurring from southern Yugoslavia sou to the Peloponnese and some of the Cyclades. It has white or lilac-blue flowers, sometimes quite a rich colour almost to violet-blue, and there is nearly always some darker veining towards the base of the segments. In this species the style is divided into more than 3 slender branches unlike the styles of all the other european species in its group. It has very coarsely netted corm tunics.

GROUP 2. C. imperati, C. minimus, C. corsicus, C. cambessedesii, C. malyi, C. versicolor. These are the primarily central mediterranean species, mostly with papery or parallel-fibrous corm tunics with flowers prominently striped on the outside. C. imperati occurs in west Italy from Rome southwards and this really needs little comment, it is such a well-known plant. It has two subspecies which have a slightly different distribution and can be distinguished mainly by the bract characters: subsp. imperati has two bracts surrounding the perianth tube while subsp. suaveolens has only one. Both have lilac-purple flowers marked with a buff colour and purple stripes on the outside. Some commercial stocks sold as C. imperati represent subsp. suaveolens.

C. minimus grows only in Sardinia and south Corsica and is a very variable plant. Its flowers are usually quite small but with a long tube and they are lilac to purple with varying amounts of striping and buff colouring outside. There may be one or two bracts, the variant with only one having been given the name of var. sardous. C. corsicus which is confined to Corsica, is very similar but can be distinguished by the generally larger flowers, usually with a darker orange or reddish style and by the corm tunic which is decidedly netted at the top - in C. minimus the fibres are strictly parallel. Although the commercial forms of both species look very distinct, in the wild they both vary so much as to overlap in this respect. Reports of C. imperati and C. corsicus from Sardinia are almost certainly based on variants of C. minimus.

C. cambessedesii is one of the smallest of all species, endemic to the Balearic Islands. Although closely related to the previous two it can be recognised by the smal flowers, two bracts which are almost equal in length, and the papery corm tunic. Its flowers are either white or pale lilac with dark stripes on the outside, much less strongly coloured than either C. minimus or C. corsicus.

C. versicolor from NW Italy and SE France (especially the Maritime Alps) has a long history of cultivation and was at one time grown in an enormous range of varieties Nowadays it is only seen commercially in its var. picturatus which is white with dark stripes on the outside. In the wild it varies through to quite a deep lilac, usually having a certain amount of striping or veining, at least towards the base of the segments. The throat colour may be faintly yellow or white. In flower size it is nearer to C. imperati than the others mentioned in this group but it is clearly distinguishable by its generally paler flowers with at most a pale yellow throat and by the markedly grey-green leaves which have conspicuous ribs in the two grooves on the underside.

C. malyi is the one member of the group which has no bold striping or veining. Its lovely white flowers with a deep yellow throat are often stained brown or bluish on the tube and base of segments and the style is long and a showy deep orange colour. It occurs only in W. Yugoslavia on the Adriatic coastal mountains.

Group 3 This autumn-flowering group, mainly with parallel-fibrous corm tunics, is distributed widely in Europe. They have a prophyll (basal spathe), and the bract sheathing the perianth tube is usually tinged green or speckled with green or brownish dots. The species included are C. nudiflorus, C. serotinus, C. longiflorus, C. medius C. niveus and C. goulimyi.

C. nudiflorus is widespread in SW France, the Pyrenees and N. Spain and is characterised by its long perianth tube and absence of leaves at flowering time, these remaining dormant for a long time after the flowers have disappeared. Although the commonly cultivated form is a deep purple, it does vary in the wild to a much paler lilac-purple. The corms produce stolons which make it a rapid increaser when it is growing well, and it prefers rich soil which is not too dry in summer. C. serotinus is closely related; this name is the oldest one for the plants described as C. asturicus, C. clusii, C. salzmanni and C. granatensis. There are three subspecies differing mainly from each other in their corm tunics: Subsp. serotinus has a coarsely netted tunic and occurs in C & S Portugal; subsp. clusii grows in C & N Portugal and has finely netted tunics of rather silky fibres, and subsp. salzmannii has parallel-fibrous tunics. The last is the most variable and most widespread, from northern Spain south to N. Africa, and over this area its flowers range from rather small, and often deep lilac-purple, to very large, silvery-lavender and the throat may be white to yellow. The leaves may be visible at flowering time, sometimes equalling the flowers, or they may be undeveloped. However, unlike those of C. nudiflorus, they always appear during or immediately after the flowering period. Sometimes C. serotinus produces stoloniferous forms.

C. medius is a rather distinctive species from NW Italy and the adjacent part of France which has a coarsely netted corm tunic and lacks leaves at flowering time. The flowers are often a lovely shade of purple, veined darker, and the many style branches are a rich orange - here again, the commerical form is a particularly fine one. From the other end of Italy, and extending to Sicily and Malta, comes C. longiflorus. This also has netted corm tunics but has its leaves partly developed at flowering time and the lilac flowers are usually marked with dark stripes on the outside, often with a buff ground colour. The style is branched into three red arms, in which respect it resembles species of the Saffron group.

The other two members of this group are Greek and occupy a similar area in the southern Peloponnese although they are clearly distinct and need not be confused. C. goulimyi has a smooth, non-fibrous corm tunic somewhat similar to that of C. laevigatus. Its flowers are long-tubed and usually lilac blue with no yellow in the throat. The inner and outer segments are often a slightly different shade giving a bicoloured effect. C. niveus has on the other hand a fibrous tunic and a rich yellow throat to the larger flower which may be white or pale lavender. Both species have the leaves partly developed at flowering time.

Group 4. The Saffron group is made up of those species with a finely netted corm tunic; a prophyll present, and both bract and bracteole. The style is divided into 3 red branches. The species are C. cartwrightianus, C. oreocreticus, C. pallasii, C. thomasii, C. hadriaticus and C. sativus, the plant which is cultivated for its long red styles as the source of Saffron. It is really exactly like a large version of the Greek C. cartwrightianus and I imagine may well be a selection of this species. All species in this group have leaves which develop at or before flowering. C. cartwrightianus occurs only in Attica, on the Cyclades Islands and in Crete. It is a low altitude plant and exceedingly common where it does occur. There is great variation in flower colour from purple to pure white, some forms being white with purple veins or a zone of purple in the throat. The style branches are long, arising down in the throat, which is never yellow. C. oreocreticus, from the higher mountains of Crete, is similar but has glabrous leaves, a glabrous throat to the flower, and the segments usually have a silvery or buff 'wash' on the outside.

C. pallasii is, in Europe, a more northerly plant than C. cartwrightianus being found in Yugoslavia and Bulgaria east to the Crimea, and it differs in having shorter style branches which arise higher up the style, not in the throat. The flowers are normally lilac with less conspicuous veining than in C. cartwrightianus and they are very rarely found in white forms whereas in the latter species albinos often represent a large proportion in some of the populations. C. thomasii is very like C. pallasii but can be recognised farily readily by the yellow zone in the throat; this is found in southern Italy and the Adriatic coastal area of Yugoslavia. The final member of the Saffron group in Europe is C. hadriaticus which also has a yellow throat but is white-flowered. As in C. pallasii the style divides higher up than in C. cartwrightianus so that C. hadriaticus can be distinguished from the latter on this character there is any doubt. Normally C. hadriaticus is easily distinguishable by its yellow throat from the white forms of C. cartwrightianus but on Mt. Parnassus there are populations without yellow throats in which case one has to resort to the style branch features. Very rarely in the S. Peloponnese it is possible to find forms of C. hadriaticus which are faintly flushed with lilac.

Group 5. C. laevigatus, C. tournefortii and C. boryi. These three-species fall into a natural group, having non-fibrous corm tunics, leaves developing with the flowers, whitish anthers, much-divided styles and a lack of a prophyll. They are all Greek species but differ slightly in their distribution patters, the only place where all three meet being in eastern Crete. C. laevigatus can be easily distinguished from the other two by its tough corm tunic which splits into triangular teeth at the base. It flowers are normally strongly striped which gives them a rather distinctive appearance, but it is an exceedingly variable species having white to deep lilac flowers which are produced from September to February. Only white forms occur on Crete, with or without striping, whereas the Cyclades ones usually have a lilac ground colour. It also occurs in Attica and the Peloponnese but both white and lilac can be found in mixed populations in these areas. Albinos often have a lovely yellow exterior.

C. boryi is usually much larger and has white or creamy flowers, generally with little striping although in wild populations a careful search usually yields a few which are striped or even suffused purple. C. tournefortii on the other hand is usually lilac flowered but the two are very alike and in Crete where white forms of C. tournefortii occur it is hard to tell the difference. There is however an interesting and probably fairly fundamental difference when it comes to pollination: C. tournefortii keeps its flowers open during their whole life whereas those of C. boryi close up in poor light. The distributions of these two are rather different, C. boryi inhabiting western Greece from Corfu south to the Peloponnese while C. tournefortii inhabits the Cyclades. Only in eastern Crete do the two meet and overlap and here I suspect that hybridisation is taking place.

Group 6. The C. vernus group, comprised of C. vernus, C. tommasininus, C. kosaninii C. etruscus, C. vernus scarcely needs any introduction for it can be seen in most gardens in one form or another in the early spring - Purple, white and striped ones most of which are selections within the one species. It occurs throughout the mountains of southern Europe from the Pyrenees to Russia and as far north as Poland south to Albania and Sicily. Two subspecies can be recognised, the larger-flowered subsp. vernus which has its stigma overtopping the anthers and the small, often white, little alpine crocus with a short stigma, subsp. albiflorus. In various regions different names have been given to slight variants - for example C. heuffelianus and C. scepusiensis for the large dark-tipped ones from eastern Europe, and C. napolitanus for the rich purple ones in Italy.

C. tommasinianus is a close relative but is clearly a distinct species to all who grow crocuses although it is not always so easy to describe those differences in words. It is a delightful plant for naturalising in the garden and in Yugoslavian

woodlands along the southern Adriatic coastal region it can be seen carpeting the ground as thickly as bluebells. In gardens it varies enormously in colour from lilac to deep ruby purple, and white and dark-tipped forms can also be found. Both C. vernus and C. tommasinianus lack any yellow in the throat of the flower but the next two, C. etruscus and C. kosaninii have yellow throats. The first occurs in northern Italy and has lilac flowers marked with a buff, purple-striped exterior while C. kosaninii is from southern Yugoslavia and lacks this type of colouring and markings on the outside. The two can be distinguished in several other ways but the corm tunics are strikingly different - coarsley netted in C. etruscus and finely so in C. kosaninii.

Group 7. The 'Annulate' crocuses are a taxonomically difficult group and present great problems. The European ones are not too troublesome to sort out but in Turkey there is a multitude of different variants of C. biflorus. Until someone can afford the time and money to do field studies of populations throughout the range of C. biflorus we will not progress very much farther than we are now in our understanding of the group. Since C. biflorus, in its wide sense, is distributed from Italy to Iran, and is common in one form or another over most of this whole area, I imagine that it would take at least 10 years of field work.

For practical purposes the present situation is that the very widespread annulate blue or white, variously striped, spring crocus is called C. biflorus while the yellow flowered plant, which occurs over a much more restricted area, is called C. chrysanthus. The two are seldom found growing together but when they are, curiously coloured hybrids might be found; C. chrysanthus occurs in the Balkans and western and central Turkey only, so the overlap zone is not great.

In Europe C. biflorus can be recognised in six subspecies: subsp. biflorus is the Italian one with a white or lilac ground colour to the flowers, usually with 3 or 5 stripes of violet or brown on the outside and a yellow throat; subsp. weldenii is white-flowered, unstriped and with no yellow in the throat; sometimes there is a bluish stain on the tube and base of the segments. This inhabits W. Yugoslavia and Albania in the Adriatic coastal mountains. Inland, in S. Yugoslavia, there is subsp. alexandri which also has no yellow in the throat but the flowers are strongly stained on the exterior with purple. Subsp. adamii also occurs in S. Yugoslavia and eastwards to the Crimea, Caucasus and Iran - this is white or lilac-blue with a yellow throat and is usually striped on the outside of the flowers, so that it resembles subsp. biflorus, but there are leaf anatomy differences and cytologically the two are quite different. All those subspecies mentioned to date have yellow anthers, sometimes with black basal lobes, but the next two have blackish anthers. In northern Greece there is subsp. stridii, usually white-flowered with stripes on the outside, while in the Peloponnese there is subsp. melantherus, similar to it but autumn-flowering. This has been called "C. crewei" but this name actually refers to a different plant from western Turkey. Like stridii it has white flowers, usually striped but sometimes speckled greyish or violet on the exterior.

C. chrysanthus is for practical purposes a yellow-flowered version of C. biflorus. This is itself is quite variable and with more field studies it might be possible to recognise certain variants of it. It occurs over a wide altitudinal range and to equate the very long-leaved lowland ones from northern Greece with the mountain ones flowering near the melting snow, with hardly any leaf visible, seems ridiculous; but in practice many intermediates can be found and for the present there is no sensible alternative but to treat them all as one species. The yellow flower colour of C. chrysanthus varies a little in depth and it is possible to find purple-tubed forms. In european Turkey, N. Greece, Bulgaria and S. Yugoslavia, white forms occur in mixed populations with the yellow and it is probably that C. pallidus represents one such plant. As with C. biflorus, intensive population studies in the

field are badly needed throughout the range of C. chrysanthus.

The most distinct member of the annulate group in Europe is C. pestalozzae from around Istanbul. It is a delightful small-flowered crocus, in white or clear blue forms, and has very distinctive sheathing leaves which are green even when they pierce through the ground. There is a blackish stain at the very base of each stamen which is a helpful guide to identification.

Group 8. C. speciosus and C. pulchellus. These are also 'annulate' species in having corm tunics with rings at the base but they are not closely related to the previous group. They are autumn-flowering species with no leaves at flowering time, these remaining dormant for a long time after. Both have much-divided styles whereas all the other annulate ones (including the autumnal C. biflorus subsp. melantherus) have 3-branched styles.

C. speciosus is mainly asiatic but does also occur in Crimea; it has yellow anthers whereas C. pulchellus, which is common in S. Yugoslavia, N. Greece and S. Bulgaria, has white anthers. There are of course several other distinguishing features, like the hairiness of the filament of C. pulchellus, and the overall flower shape and colour, and to anyone who has grown both there is little need for comparison.

Group 9. C. olivieri and C. flavus. These two yellow spring-flowering species belong to a mainly eastern mediterranean group with parallel-fibrous corm tunics. C. flavus (C. aureus) is the well-known yellow crocus of our gardens, although the most commonly seen cultivar, the large Dutch Yellow, is a hybrid between C. flavus and C. angustifolius (C. susianus). In the wild C. flavus is widespread in the Balkans and western Turkey and is quite variable in size, but in colour there is only a little variation in depth of orange-yellow; sometimes the perianth tube is stained violet and occasionally there are a few dark veins towards the base of the segments. The numerous varieties which existed in the 19th century were mostly garden selections or hybrids. Characteristic features of C. flavus include the long neck of brown fibres at the apex of the corm, the rather numerous erect leaves and the very markedly arrow-shaped anthers. Normally C. flavus has its small style divided into 3 branches but subsp. dissectus from western Turkey has at least 6. C. olivieri can be recognised by its fewer broader leaves, often spreading rather than erect. The style is always divided into 6 or more branches and the corms never have a brown neck at the apex, so that the two species can be easily distinguished at all stages of growth.

Group 10. C. carpetanus and C. nevadensis. Although these two species from the Iberian peninsular can be distinguished by their leaf sections alone, they are clearly related. They have different distributions, C. carpetanus occurring in central and northern Spain and northern Portugal and C. nevadensis in south and east Spain and North Africa. C. carpetanus is extremely variable in its flower colour from nearly white to lilac, veined darker, and some forms are stained purple on the outside; the throat is white or pale yellow and the style is white or cream-coloured, divided in such a way that it looks like a miniature cauliflower. The leaves are very distinctive, having a broad silvery stripe on the upper surface, almost the whole width of the leaf; the underside is rounded with several shallow grooves. C. nevadensis has a more conventional leaf shape, that is with a distinct keel with a deeper groove on either side; the keel itself however has several shallow grooves so that the leaf is almost like a 'halfway stage' between C. carpetanus and a typical crocus leaf. The flowers of C. nevadensis also vary from white to lilac with variable amounts of veining and they often have a slightly greenish or yellowish tinge; the throat too may be white or yellowish. Both species are mountains plants,

growing in moist alpine turf or stony places and are not too difficult to grow in a cold frame with plenty of water in spring.

Group 11. C. scardicus and C. pelistericus. These two species are rare in cultivation at present but the first is grown with great success by Mr H. Esslemont in Aberdeen. Being mountain plants they like cool growing conditions throughout the year and rather peaty, gritty soil. C. scardicus occurs in S. Yugoslavia in the Šar mountains west of Skopje, on into Albania, while C. pelistericus inhabits various mountains to the south of this, down to the Greek border. Its type locality is in the National Park on Mt. Pelister just to the east of Lake Prespa. The interesting feature of both species is the lack of a white stripe on the upper surface of the leaves. In C. scardicus the flower colour is yellow-orange with a purple base to the segments while in C. pelistericus it is wholly deep violet.

(12) The only other species to be found in Europe is C. banaticus, so different that there is no necessity for a discussion about relationships. It is an autumn-flowering meadow plant from north-eastern Yugoslavia, Roumania and the Ukraine and is one of the best and easiest garden crocuses. The inner segments are very small compared to the outer ones and they remain erect, whereas in sunshine the outer ones bend outwards like the falls of an Iris - hence the excellent but unfortunately incorrect name of C. iridiflorus. The large much-dissected lilac style is also a prominent feature of this distinctive species.

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