SOME OBSERVATIONS ON TURKISH CROCUS

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ABSTRACT. As a result of recent collections of *Crocus* in Turkey, it has been possible to clarify the status of seven little-known species. Some are maintained at specific level, others reduced to synonymy; their distributions are discussed. The taxa reviewed are *C. parviflorus* Baker, *C. leichtlinii* (D. Dewar) Bowles, *C. dispathaceus* Bowles, *C. mouradii* Whittall, *C. boissieri* Maw, *C. pestalozzae* Boiss. and *C. karduchorum* [Kotschy ex] Maw.

In this paper, which discusses the status of some little-known species of *Crocus* in Turkey, all the specimens cited have been examined unless otherwise stated.

1. C. fleischeri J. Gay in Bull. Sci. Nat. Geol. 25:319 (1832).

Syn.: *C. parviflorus* Baker in Journ. Bot. 14:266 (1876). Type: [Turkey, C5 Adana] Cilician Taurus, spring 1876, *Mrs. A. G. Danford* (lecto. K) syn. nov.

Type. [Turkey B1 Izmir] Habitat Smyrnae, *Fleischer*, Jan.-Feb. 1827 (holo. K, iso. E)

B2 Kütahya: 3 km from Abide on road to Uşak, *Baytop, Brickell & Mathew* 8237 (K). C2 Muğla: between Muğla and Ula, *Rix* 1300 (K). Denizli: Kazik Beli to Acipayam road, 1000 m, *A. Baytop* 23753 (K); Göktepe to Muğla road, *Baytop, Brickell & Mathew* 8352 (K); Honaz Da., road to summit, 1050 m, *Baytop, Brickell & Mathew* 8260 (K). Antalya: Kale to Muğla road, 20 km from Muğla, 1250 m, *Baytop, Brickell & Mathew* 8293 (K); Cybira, *Forbes* 512 (K); C5 Adana: Pozanti d., Bürücek, 1300 m, *Davis & Hedge, D.* 26346 (E, K); Cilician Gates, *Siehe* 1896: 32 (E, K); Namrun (Çamliyayla), *Siehe* s.n. (E); Hadachim Da., *Siehe* 1896: 685 (E) [mixed gathering of *C. fleischeri* & *C. danfordiae* Maw]. Is. Chios: Thalopotami, *Platt* 371 (K).

C. PARVIFLORUS. This minute-flowered crocus has caused some concern to students of the genus and to collectors from the time it was described, for it has never been rediscovered since the type collection in 1876. However, it is now obvious that the whole mystery surrounding this species has been caused by a mixed type gathering consisting of the flowerless corms of *C. fleischeri* J. Gay and the cormless flowering plants of *C. danfordiae* Maw.

C. fleischeri is a widespread species in south and south-west Turkey and the east Aegean Islands. The fact that it occurs as far east as the Cilician Taurus has been known at least since the time of Maw, but more recently exactly localised collections have been made showing that it grows near the type locality of *C. parviflorus* (e.g. *Davis & Hedge, D.* 26346).

C. danfordiae occupies a large area of central Turkey but it too reaches the Cilician Taurus and has also been gathered at the type locality of *C. parviflorus*, at Eskikonacik (Anascha) near Pozanti (e.g. *T. Baytop* 23968). Both

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species flower in early spring and the most likely explanation for the confusion is that when making the original collection, Mrs. A. G. Danford picked some flowers of *C. danfordiae* and dug up some corms of *C. fleischeri*, assuming them to be of the same species. On the type specimen there are two flowering plants cut off at ground level and two corms without flowers. Since both flowering and flowerless specimens possess leaves it is quite clear that the two sets of parts could not be from the same plants. Maw's Plate 67 (1886) of *C. parviflorus*, drawn from the Kew specimens, shows two entire plants made up of the combined characters of the two species; an attractive plate but unfortunately quite incorrect.

With regard to the type locality of this 'false' species, it seems likely that Maw had some correspondence with Mrs Danford, for the details given by him are in much greater detail than those given by Baker. The latter describes fully in his paper of 1876, and quotes from a letter from Mrs Danford, the details of the locality of *Xiphion danfordiae* Bak. [=*Iris danfordiae* (Bak.) Boiss.] but does not state that *C. parviflorus* was collected in the same place. In fact he says no more than that it was one of a collection made in the Cilician Taurus in spring 1876. We must assume therefore that Maw received further details from Mrs Danford which enabled him to place the type locality as "about a mile to the south-west of Anascha" (now Eskikonacik).

Of the four specimens on the type sheet we have selected one of those which possesses a corm as the lectotype. *C. parviflorus* Bak. (1876) therefore goes into synonymy under *C. fleischeri* J. Gay. Maw's Sect. *Intertexti*, i.e. those species having a corm tunic consisting of interwoven or plaited fibres, now contains one species only, *C. fleischeri*.

2. C. leichtlinii (D. Dewar) Bowles, A handbook of Crocus and Colchicum ed. 1:142 (1924).

Syn.: *C. biflorus* Miller var. *leichtlinii* D. Dewar in Gard. Chron. Ser. 3, 9:235 (1891). Type: [Turkey, C8 Mardin] Mardin, cultivated at Kew from corms sent by Leichtlin (K).

B7: Elaziğ-Diyarbakir border, between Ergani and Maden, *T. Baytop* 31328 (ISTE, K). C7 Diyarbakir: slopes of Karacadağ, 1100 m, *T. Baytop* 31324 (ISTE, K). C8 Mardin: between Mardin and Savur, *Sauer* 128 (E). It has been reported that *Albury, Cheese and Watson* 1084, also collected on Karacadağ (R. Cobb—personal communication), is also referable to *C. leichtlinii* although this collection has not yet been seen in flower by the authors.

Corms of *C. leichtlinii* were first sent in the autumn of 1890 to Kew Gardens by the nurseryman Max Leichtlin of Baden-Baden, allegedly having been collected in the general area of Mardin in southern Turkey. They flowered the following spring and were recognised by Daniel Dewar (foreman of the Herbaceous Ground department from 1880 to 1893) as representing a new crocus which he identified as a variety of *C. biflorus*. The type gathering apparently remained in cultivation at least until 1924, when E. A. Bowles raised the taxon to specific rank, but it is fairly certain that it was subsequently lost, and as the exact locality was never specified it remained somewhat of a mystery until recently. It is therefore of great interest to record that it has now been re-collected and that it occurs in considerable quantity.

The original description indicated that the colour of *C. leichtlinii* was rather pale, and Bowles refers to it as greenish-yellow, but it is now known to be normally lilac-blue with a deep yellow or orange throat. Externally, the base of the segments and perianth tube are shaded with darker greyish-blue. As mentioned by Bowles, the connective of the yellow anthers is greenish-grey although this may not be a constant feature. *C. leichtlinii* is probably not very closely related to *C. biflorus* although it was first placed as a variety of this. *C. biflorus* belongs to the annulate group in which the base of the corm tunic splits off into distinct rings of tissue. In *C. leichtlinii* there is no obvious basal tunic at all and the main tunic splits longitudinally into many narrowly triangular strips, not unlike that of the Greek *C. laevigatus*, although there is no other relationship between the two. The most vigorous specimen collected on Karacadağ has 13 leaves and the weakest 6, which is more than *C. biflorus* normally produces.

3. C. dispathaceus Bowles, A handbook of Crocus and Colchicum ed. 1:68 (1924).

Type. Cultivated specimen, from corms distributed by *G. Egger*, of unknown origin (K).

B3 Konya: Sultan Da., above Dereçine, *A. Baytop* 33987 (ISTE, K). C3 Konya: between Akseki and Beyşehir, 48 km from Beyşehir, 1500 m, *A. Baytop* 26890 (ISTE, K). C4 Içel: between Gülnar and Aydincik, 700–800 m, *T. Baytop* 23975 (ISTE, K), 31193 (ISTE, K); 18 km from Aydincik on road to Gülnar, 700 m, *Baytop, Brickell & Mathew* 8431 (K) (fruiting material). Syria. Aleppo, American College Grounds, 350 m, *Chapman* 102 (K); *Mrs G. Kirkwood* KAL-3 (K).

This autumn-flowering crocus belongs to the group of species related to the saffron crocus, *C. sativus* L. However, it is not difficult to distinguish from the rest of the species in the group, or indeed from any other *Crocus*, since it is the only one having wine-purple coloured flowers. The specific name refers to the two membranous prophylls which subtend the pedicel of each flower, referred to as the "basal spathe" by Bowles. These are distinct from the bract and bracteole subtending the ovary which Bowles regarded as forming his "proper spathe". In the *C. sativus* group generally there is one prophyll, and both bract and bracteole are present, but *C. dispathaceus* differs in having two prophylls as well as the bract and bracteole. Unfortunately as yet it has not been possible to examine much living material to see if this is a constant feature. Another unusual character of this species is the rather short yellow or orange style, the species of the *C. sativus* group normally being noted for their brilliant scarlet, often long, style branches so highly valued for their colouring or flavouring properties. *C. dispathaceus* has the finely netted silky corm tunic which is characteristic of the group.

The origin of the first collection is unknown, the only information being that it was distributed under the name "*C. tauri*" by Georg Egger, a nurseryman from Jaffa who specialised in the bulbous plants of Asia Minor. The herbarium specimen at Kew bears the label "*C. tauri*, Aleppo?, Comm. G. Egger jr., 17th Dec. 1912". It is not known if the reference to Aleppo was a guess on the part of the Kew staff or whether it had more foundation.

Although Egger's main office was at Jaffa there is reason to suppose that he had either another nursery at Aleppo or used it as a point of despatch since several specimens at Kew bear the label "Egger, Aleppo." The date probably refers to the time it flowered at Kew, not the collecting date. The Kew "Inwards Book" of accessions of that period shows that substantial orders for bulbs were placed with Egger, including such items as *Eranthis cilicica*, *Galanthus fosteri*, *Iris danfordiae*, *I. tauri* and *Sternbergia fischeriana*, all natives of the Cilician Taurus mountains in Turkey, proving that either he collected there or he employed local people to do so.

The only specimen of *C. dispathaceus* known to exist up until 1973, other than the type, was one made in 1950 in the American College grounds at Aleppo. In 1974 the species was again collected in the Aleppo College after enquiries were made concerning its continued existence there. It is therefore not known if this occurs as a true native in Syria or whether it was introduced, perhaps by Egger. In March 1973 a *Crocus* was collected out of flower in the Taurus by Prof. T. Baytop and when it later flowered in Istanbul it proved to be *C. dispathaceus*.

The species obviously occurs wild in the Cilician Taurus, and it could therefore have been collected in this region by Egger and despatched from Aleppo. Whether or not it is a wild plant also in Aleppo must remain an open question for the time being.

4. C. flavus Weston subsp. **dissectus** T. Baytop & B. Mathew in Kew Bull. 30:241 (1975).

Syn.: *C. mouradii* Whittall in The Garden 35:473 (1889). Type. [Turkey, B2 Kütahya] Murat Da. (no specimen is known to exist).

Type. Turkey, B2 Kütahya: Efendiköprüsü to Gediz, 1200 m, *T. Baytop* 23990 (holo. K; iso. ISTE).

B1 Balikesir: between Balikesir and Edremit, 545 m, *Leep & Pasche* 70/8 (K). B2: Balikesir to Izmir, 18 km from Bigadiç, *A. & T. Baytop* 10667 (ISTE, K); near Suçikti, W of Dursunbey, *Leep & Pasche* 72/5 (K). Kütahya: Çavdarhisar to Gediz, 1200 m, *T. Baytop* 21333 (ISTE, K), *T. Baytop, Brickell & Mathew* 8225 (K); between Domaniç and Tunçbilek, 1150 m, *T. Baytop, Brickell & Mathew* 8212 (K); between Tavşanli and Kütahya, 20 km before Kütahya, 800 m, *T. Baytop, Brickell & Mathew* 9218 (K). C2 Denizli: Kazik Beli Pass, 10 km after Çukurköy, 1200 m, *T. Baytop, Brickell & Mathew* 8280 (K).

C. MOURADII. This yellow-flowered species was described rather briefly by Edward Whittall of Izmir, but enough information can be gleaned to make it possible to regard the name as a synonym of *C. flavus* subsp. *dissectus*. The only other possibility would be that it is a synonym of *C. chrysanthus* Herb., but since the description includes the statement that it has "seven or eight proper leaves" this is very unlikely, since *C. chrysanthus* usually has only 3 or 4 leaves. Apart from this, the description could refer to either species for although Whittall says "flower bright orange, apparently more brilliant than in *C. chrysanthus* and *C. aureus*" (*C. flavus*), it is well known that the variation in depth of colour is considerable in these two species.

The Crocus was gathered by one of Whittall's collectors on Mourad Da. (now Murat Da.), a mountain near Gediz and tentatively given the name *C. mouradii* "till Mr Barr and his friends class it better".

During the spring of 1975 the authors and C. D. Brickell visited Murat Da to ascertain which yellow flowered Crocus grow there and if so whether they match the scanty description. It was found that both *C. chrysanthus* and *C. flavus* subsp. *dissectus* grow in considerably quantity, and for the reason stated above it seems that there is no doubt that *C. mouradii* is best treated as a synonym of the latter.

5. C. boissieri Maw in Gard. Chron. 1881, 2:304 (1881).
Type. Turkey: Cilicia, near the cave of Corycus, *Tchihatcheff* (G).

Although a colour plate of this species exists in Maw's monograph of Crocus (1886) very little is known about it, for the whole illustration is based upon a single incomplete specimen in the Boissier herbarium. Unfortunately this state of affairs continues for although several searches have now been made in the type locality no trace of a crocus in the area has been found and it seems likely that there is some inaccuracy in the information given. The collection date of the type is stated to be 30th June which is late for any Crocus to be flowering in Turkey. In addition to this, the locality Corycus (now near a place called Cennet) is less than 100 m above sea level on the mediterranean coast. The occurrence of a crocus in flower in this sun-scorched maquis area is extremely unlikely and it must be assumed that in order to re-locate *C. boissieri* a search will have to be made either in another area higher up in Taurus mountains or much earlier in the year with the assumption that the date is incorrect.

C. boissieri is the only known species of Turkish crocus which awaits recollection although there may of course be other new species to be discovered. All the described species are now in cultivation so that their morphological and cytological characters can be assessed from living material. It is therefore of some importance that *C. boissieri*, which from the scanty type material appears to be a distinct species, is located so that the study of the genus can be completed.

6. C. pestalozzae Boiss., Diagn. Ser. 1, 13:17 (1853).
Syn.: *C. aerius* Herb. var. *nubigenus* Herb. subvar. *pestalozzae* (Boiss.) Maw in Gard. Chron. n.s. 16:749 (1881).
C. biflorus Mill var. *pestalozzae* (Boiss.) Boiss., Fl. Orient. 5:112 (1882).
Type. [Turkey A3 Bolu.] Bithynia, near Bolu, *Pestalozza* (B).
A2 Istanbul: between Yakacik and Samandira, *T. Baytop* 27210 (ISTE, K), *Demiriz* 1271 (E, ISTF—n.v.); Üsküdar, Çamlica, 150 m, *Davis & Polunin*, *D.* 25109. (E, K); Başibüyük, *T. Baytop* 9 (K); Levent to Ayazaga, Golf Club, *Demiriz* 1260 (E, ISTF—n.v.); *Balls* B. 2058 (E, K); "Constantinople", with no precise data, introduced 1929 by unspecified collector, cult. specimen 1970 (blue form) (K).

C. pestalozzae is a small-flowered spring crocus which is known only from a few collections in north-west Turkey. It is certainly related to *C. biflorus* Miller and is part of the complex group of species with membranous corm tunics which separate into rings ("annulate"), near the base. This includes *C. chrysanthus* Herb., *C. crewei* Hook f. and *C. danfordiae* Maw. *C. pestalozzae* is one of the more distinct entities here and although it sometimes occurs in mixed populations with *C. biflorus*, it is easily distinguished and appears not to hybridise with the latter. Initially the most notable features are the sheathing leaves which are green from the time they emerge from the soil, not white or brown and papery as in *C. biflorus*. The true leaves are very narrow and thread-like and the overall size of the flower is smaller than that of the average *C. biflorus* although there is some overlap in the dimensions. A curious character which is an aid to instant recognition is the possession of an almost blackish stain at the very base of each filament, a seemingly rather trivial feature yet one which appears to be constant and therefore of considerable practical value, especially when dealing with live material. This was observed by Bowles (1924) who commented "These minute black specks at a first glance look like tiny pellets of soil fallen into the throat of the flower".

C. pestalozzae exists in two colour forms, white and blue, both with a yellow throat. The original collection possessed white flowers and it was known only in this form to Maw (1886) who was probably the first person to gather wild material and cultivate the species. However he regarded it only as an albino of *C. biflorus* var. *nubigenus* (Herbert) Bak., a purple-striped form with brownish-purple anthers which is more closely akin to the plant we now know as *C. crewei* Hook. f.

The blue form was not collected and introduced to Britain until much later when in 1929 a consignment of crocus corms was sent from Istanbul to the nurserymen Mr J. Hoog of Haarlem and Messrs Barr & Sons. These subsequently flowered and were identified by E. A. Bowles as being the blue-flowered form of *C. pestalozzae*. It was later listed by Messrs Barr as *C. pestalozzae* var. *caerulea*. The locality was not recorded with any accuracy and the only information available is that it was collected 'near Constantinople'.

7. **C. karduchorum** [Kotschy ex] Maw in Gard. Chron. 20 Aug. 1881:234 (1881).
Type. [Turkey B9 Van-Bitlis border] between Müküs and Schirwan at 6000 feet, 27 ix 1859, *Kotschy* 469 (holo. WU—n.v.; iso. K)
B9 Bitlis: between Hizan and Tatvan, 19 km from Hizan, 1950 m, *T. Baytop* 31134 (ISTE, K).

This lilac autumn-flowering species belongs to the same group of white-anthered species as *C. kotschyanus* C. Koch but may be recognised by its much branched white stigma and white throat which lacks the yellow spotting at the base of the segments, so characteristic of *C. kotschyanus*. In addition, *C. karduchorum* possesses only a bract, the bracteole which is present in *C. kotschyanus* being undeveloped. This character is shared with two other members of the group, *C. vallicola* Herb. and *C. gilanicus* Mathew but

C. karduchorum differs from these two white or very pale lilac-flowered species in having rather deep lilac-coloured flowers and a much-dissected style, already mentioned above.

There is another plant which comes into consideration, *C. kotschyanus* var. *leucopharynx* B. L. Burtt, which also has a white throat with no yellow spotting but like *C. kotschyanus* this possesses a bracteole. The origin of this variety is a little obscure but it is recorded as having been introduced by W. Siehe from the southern Turkish region of Cilicia under the name of "*C. karduchorum*" and has been distributed as this by nurseries ever since.

It is now possible to compare all the species within this group from living material since the true *C. karduchorum* has now been re-collected near the type locality by T. Baytop. The original gathering by Kotschy on 27th September 1859 was made between Müküs (now Bahçesaray) and Schirwan, south of Lake Van. Many attempts to recollect this in the region have failed, but on 25th September 1974 it was located about 19 km from Hizan, which is about equidistant from the two towns, and introduced to cultivation in Britain under the number *T. Baytop* 31134.

The plate in Maw's monograph (1886) of *C. karduchorum*, drawn from herbarium specimens, is rather misleading for although the flower characters are quite accurate, the corm shape is incorrect. It is in fact rather flat instead of ovoid and is often orientated on edge, or partly so, not perfectly upright as indicated. The type specimen shows this feature quite clearly. In its corm characters it thus resembles *C. kotschyanus* (*C. zonatus* Gay), although Maw (1879) stated "the long corm (as distinct from the very flat corm of *C. zonatus*) . . . suggests a specific distinction from Gay's *C. zonatus*". Additionally, the illustration shows green leaves present at flowering time, again rather misleading. The presence of the previous season's leaves at flowering time is almost certainly an abnormal state which occurs when a very late spring has delayed development so that the autumnal flowers are produced before the leaves have completed their growth. On the high mountains of eastern Turkey it is not unusual for the arrival of spring to be delayed until June and the season of active growth must then be compressed into about three months. Other Crocus species which have been recorded with their previous season's leaves persisting until flowering are *C. kotschyanus* C. Koch, *C. lazicus* Boiss. and *C. haussknechtii* Boiss.

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