International Rock Gardener

ISSN 2053-7557

Number 52 **The Scottish Rock Garden Club** 2014

---International Rock Gardener---

April 2014

It is with pleasure that the IRG can this month bring to its readers the latest paper from Jānis Rukšāns the well-known bulb expert. Dr Rukšāns is the author, in English, of the book *Crocuses: A complete Guide to the Genus* and *Buried Treasures: finding and Growing the World's Choicest Bulbs*, as well as several titles in Latvian, his native tongue. Jānis has long been generous in his contributions to the SRGC forum with his tales of travel and plant exploration as well as sharing news from his nursery, now run with his step-daughter Līga Popova – complete with his exasperation at predation of his bulb collection by rodents making free with his stocks under cover of winter snow. At present Jānis grows more than 1500 samples of crocuses in his collection; among them are several new, undescribed species, on which further observations are needed.

Cover picture: *Crocus brickellii* photo by Jānis Rukšāns

---Plant Descriptions---

Here Dr Rukšāns specifies the features of *Crocus chrysanthus* s.str. from type locality, describes four new species and changes the status of one other. All this information will be added to the Crocus Pages on the SRGC website.

Crocus danfordiae Maw and *C. chrysanthus* (Herbert) Herbert (*Iridaceae*) and some of their allies in Turkey and Iran.

Jānis Rukšāns, Dr. biol.

Received: 09-04-2014 Accepted: 12-04-2014 Published online: 25-04-2014

International Rock Gardener - Online Journal. ISSN 2053-7557

Abstract: Features of *Crocus chrysanthus* s.str. from type locality are specified. Four new species are described, status of one changed.

Key words: *Crocus brickellii, Crocus chrysanthus, Crocus danfordiae, Crocus henrikii, Crocus kurdistanicus, Crocus minutus, Crocus muglaensis, Crocus uschakensis*.

Correspondence to: janis.bulb@hawk.lv

Until recently not many crocus species with annulate corm tunics and yellow flowers were known. Only three species were recognised – the very variable and most widely distributed *Crocus chrysanthus* with narrow leaves, the broad-leaved *C. almehensis* from a small area in Iran and, quite unique among crocuses, a species with very small flowers – *C. danfordiae* which until recently was the only one where, within the same population, specimens had been found with yellow, white and blue flowers, but it is well separable from the two other "yellows" by much smaller flowers in a paler colour. The first changes were introduced by Iranian botanists who in 2002 described a new taxon from W Iran (Kurdistan) with small bright yellow flowers looking very similar to *C. danfordiae* but separated by ~600km from the easternmost population of *C. danfordiae* in Turkey. It was named as subsp. *kurdistanicus* of *C. danfordiae* but due to the isolated locality and the huge distance from the type species area, I prefer to regard it as a separate species ***Crocus kurdistanicus*** (Maroofi & Assadi) Rukšāns. I got hold of this crocus accidentally, together with the corms of a blue annulate crocus (*C. biflorus* s.l.) received from Jim Archibald, originally collected in W Iran, and in everything but the pure yellow flower colour, it resembled *C. danfordiae*. To be accurate – in my collection I grow a sample of *C. danfordiae* with pure bright yellow flowers from the W part of Turkey (between Beişekir and Huǵlu). So the status of this crocus still remains unclear, as I have not yet seen living plants from the *locus classicus*, only pictures taken by Iranian botanists.

Crocus kurdistanicus **(Maroofi & Assadi) Rukšāns status nova.** ***Crocus danfordiae*** **subsp.** ***kurdistanicus*** **Maroofi & Assadi, Iranian J. Bot. 9: 234 (2002).**

ISSN 2053-7557

In 2011 Helmut Kerndorff and Erich Pasche separated from the *Crocus danfordiae* complex the blue-coloured populations with white stigmas that were growing on 5 ridges N and W from Antalya and gave them a species name - *C. minutus*. We found this crocus more to the east, on another mountain ridge. Actually, it has already grown for years in my and other collections, but we simply had not noticed that some gatherings had white stigmas hidden deep among the anthers. Later we learned that *C. minutus* had the same variation in colour as *C. danfordiae* and one sample even had white blue-striped flowers (in Gothenburg BG - JP 91-13B).

C. minutus with white blue-striped flowers

ISSN 2053-7557

Crocus minutus

ISSN 2053-7557

Crocus minutus flower, split

In March 2012 I visited several mountain ridges along the Mediterranean coast W of Antalya (S end of Ak Dağlari) and in several localities, in places free from snow, I spotted a really beautiful crocus superficially very similar to *Crocus danfordiae* but well separable from the latter by its long stigmatic branches well exceeding the anthers, rarely ending at tips of anthers but never lower (in *C. danfordiae* they rarely reach higher than the middle of the anthers and never surpass them) and with a different throat colour. In *C. danfordiae* the throat colour is usually pale yellowish and small. In this crocus the throat is large, covering more than 1/3 of the tepals' length, deep orange-yellow with a diffused narrow yellow edge. In colour variation it is similar to *C. danfordiae*. Up to now I have not seen specimens with a bluish ground colour; all the plants observed had white or pale yellow ground colour with the greyish or bluish suffused outsides of the sepals that is characteristic of *C. danfordiae*.

The new crocus in fact represents a third parallel line to the well-known *Crocus danfordiae* and the recently described *C. minutus,* sharing with them the main features: black basal lobes of the anthers and medium coriaceous corm tunics with a 3-5mm long neck. Basal rings are distinct with a smooth edge or the edge is split in strap-like segments. Leaves (3-5) are up to 1.2mm wide, at flowering time they usually end below or are level with the flowers but soon overtop them; the white stripe covers around 1/3 of the leaf width. Lateral channels are without ribs. The flower tube is whitish with greyish,

 ISSN 2053-7557

bluish or greenish speckling. Sepals are 4-6mm wide and 18-20mm long, white or straw yellow with bluish or greyish speckling on the outside. Tepals are 5-6mm wide and 17-19 mm long, white or straw yellow throughout. Filaments are deep yellow, 3-4mm long, anthers 2-3 times longer, yellow, with black basal lobes (very rarely plain yellow) and with a whitish connective. Stigmatic branches are orange to red, long, expanding, overtopping the anthers or rarely ending at the same height.

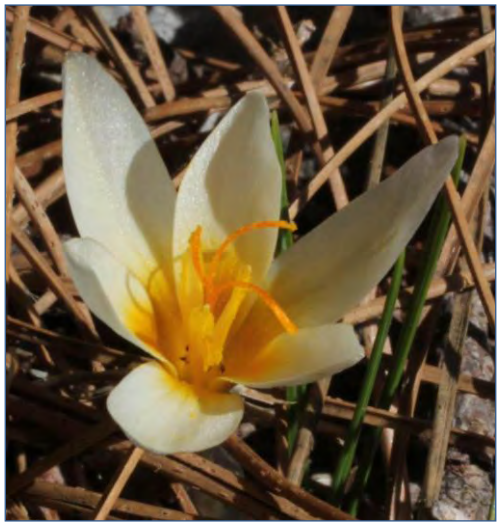
A quite similar plant (according to the description) under the name of *Crocus danfordiae* was observed in the Spil Mountains near Manisa (Ozdemir, 2004), so it is possible that this crocus has a much wider distribution than is supposed, but I have not seen plants from there. It is most likely that the plant from Spil Mountains really is a misidentified *C. chrysanthus*. A leaf cross-section picture was published in Turkish paper which showed that the leaves have 2 ribs in each channel which is characteristic only for Turkish *C. chrysanthus.* I decided to name this new crocus after Christopher Brickell - the famous British botanist and author of outstanding gardening books, former Director General of the Royal Horticultural Society, who in my younger years supplied me with seeds of the then, recently described crocus species, in such a way stimulating my interest in this genus - as ***C. brickellii***.

Crocus brickellii Rukšāns **species nova**

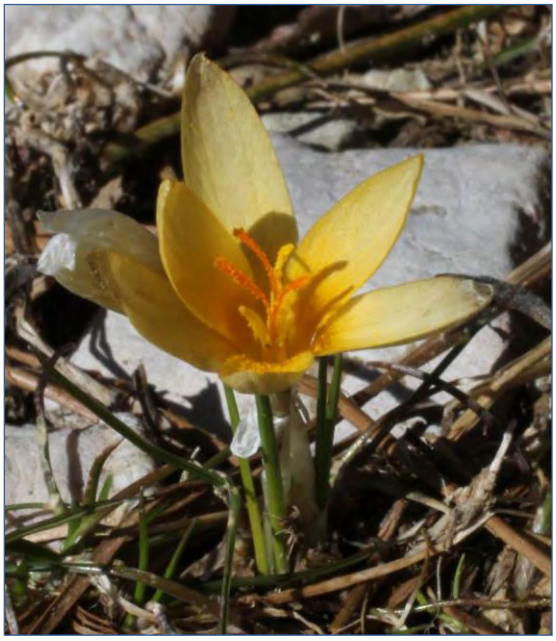
Diagnosis: Affinis *C. danfordiae* et *C. minuto*, sed ramis stigmatum longioribus quam antherae et faucibus vivide tangerinis bone differt.

Typus: Turkey, Antalya province, S end of Ak Dağlari. 03-03-2012 (12TUS-020). Holo: GB. Habitat: on open spots among pine trees, based on limestone; altitudes - 1000-1600m. Flowering period: February-March. Known from three localities but may be distributed more widely. 2n = ?

Crocus brickellii and its habitat



ISSN 2053-7557



Left: *Crocus brickellii,* yellow form

Right: *Crocus brickellii* (as cover photo)

Below: *Crocus brickellii, leaf cross-section*

Below: *Crocus brickellii* corm. All photos © Jānis Rukšāns

ISSN 2053-7557

Crocus chrysanthus is one of the most common and at the same time belongs to the most obscure crocus species. It is widely used in breeding and gardeners have raised many lovely cultivars - both as selections from the true wild species and from hybridisation with *C. biflorus* s.l. In the March, 1997 issue of “The New Plantsman” an excellent article was published about *C. chrysanthus-biflorus* cultivars written by N. Jacobsen, J. van Scheepen and M. Orgaard. It contains a key, short description and nomenclatural notes on 49 named and 6 unnamed crocus cultivars of this group. It is not known just which forms of both species were used in hybridisation. I know of only one place in the wild where they both grow together and readily hybridise producing fertile progeny. Occasional sterile hybrids can be rarely found almost everywhere where both species meet, although *C. chrysanthus* usually prefers dryer spots than the majority of *C. biflorus* s.l. (Mathew, 1982).

At the same time *Crocus chrysanthus* is one of the most challenging species for botanists, and I would even say that taxonomically it is more difficult than the *C. biflorus* group. According to Brian Mathew, it is extremely variable cytologically having cytotypes with all the possible variants of 2n from 8 to 20 and is distributed from S Romania and central Bulgaria through the Balkans to W, S and central Turkey (provinces of Sivas, Gaziantep and Maraş). Although bright yellow to orange-yellow forms dominate, in almost every locality one can find specimens with greyish, brown or purplish spotting, feathering or striping on the outsides of the tepals. Such forms are common in SW Turkey. Albinos are rare but in some populations in the European part they can be quite common; though extremely rare, they do exist in Anatolia (I found only 2 partial albinos in this part of Turkey). In SW Turkey plants with deep purple flower tubes are quite common.

Crocus chrysanthus - type, Falakro

ISSN 2053-7557

Taking into account the great cytological variability and the extremely wide area to which the name "*Crocus chrysanthus"* is applied for yellow flowering crocuses with annulate tunics, there is no doubt that under this name several species are incorporated. The greatest difficulty is to find consistent features by which to separate them morphologically without complicated laboratory analyses. As with many older taxa, the exact locality from where the type specimen of *C. chrysanthus* came is unknown. Choosing the type locality I followed B. Mathew (1982) who in his famous Monograph notes that its type originates "In Roumelia – *Frivaldsky"* and is stored in the Kew Herbarium. The name Rumelia was ultimately applied to a province composed of central Albania and the north-western part of Macedonia, whose chief town Bitola is now located in the Republic of Macedonia (FYROM). Here as typical plants for comparison I used the samples collected close to Bitola, in both Macedonias - former Yugoslavian and Greek. I compared the plants from Mt. Falakro in Greek Macedonia and from the Galičica National Park, (near Livada Pass) in the Republic of Macedonia (FYROM).

Crocus chrysanthus, Falakro

Crocus chrysanthus, Galičica

Morphological research shows that they all belong to the same type and, by examined features, all are identical. So in accord with this approach we can regard the specimens from the European part of the range as typical of the true *C. chrysanthus* and they all have 2n = 8 (Ranđelović, 2007). By most characters except the leaf cross-section they comply with the description of the species given by G. Maw. Of course, this is only a small portion of the European populations and it is possible that further different populations may be found.

Below: Leaf and cross-section and right: corm tunic of *C. chrysanthus*, 13GRS-012 ex Falakro

ISSN 2053-7557

In recent years investigations have been started and attempts made to separate new forms within this complex from the Turkish part of the range (Candan & Özhatay, 2013), but the descriptions of plants are quite incomplete and the features used for separating the taxa can be found in other distant populations. It is most difficult to find traits which are sufficiently constant and characteristic to a particular population or taxon. To separate different taxa here I used such features as the leaf morphology, the length proportions between filaments and anthers and the shape of the basal lobes of anthers as well as the shape of corm tunics' basal rings. These features turned out to be very stable within each researched population thus allowing them to be easily distinguished. In this research I investigated populations from N of Muğla, around Uschak (Uşak) and from near Gündoğmus (Antalya province). From these populations I had field observations on at least 30-50 specimens from each locality made during my trips to Turkey from 2003 up until the latest visit (2014). I compared that data with the cytological researches on plants from the same localities carried out by other authors. The results allowed all these populations to be regarded as distinct species. This is only a small part of *C. chrysanthus* s.l. from Turkey and several more species certainly could be described from the rest of the range. Specimens for type herbariums were made from plants received from the collections of the Gothenburg Botanical Garden (Sweden). In the field only measurements of morphological details and pictures were taken, thus no living material from the wild was utilised.

The first feature which allowed all the investigated populations from Turkey to separate from their European neighbour (the type of *Crocus chrysanthus* s.str.) and be regarded as taxonomically distinct species was the morphology of the leaf cross-section - presence or absence (and the number) of ribs in the grooves (lateral channels) on the underside of the leaf. In this aspect plants from the region regarded here as the type locality ("Roumelia") all have 3-4 distinct ribs in each groove and are very different from the Turkish samples in which so far I never observed more than 2 ribs in each groove (rarely 2 in one and 1 in the other), so they are easily separable from the typical *C. chrysanthus*. According to G. Maw, its leaves have no ribs; I observed such plants only in one gathering from near Skopje (N of FYROM).

Left: *Crocus chrysanthus* corm 13MCY-056, Galičica

ISSN 2053-7557

Other features used to separate species are the proportion between the lengths of filaments and anthers and the shape of the basal lobes, and also the morphology of corm tunics. All the observed specimens regarded here as type *Crocus chrysanthus* from 5 localities have anthers of approximately the same length as the filaments with long, sharply pointed basal lobes. Stigmatic branches end around the tips of the anthers or rise well above them. Corm tunics are more or less coriaceous with a 3-7mm long, bristly neck, formed by acute narrow segments. The basal rings are distinct, with densely spaced, sharp, 1mm long and narrow teeth (Galičica; 13MCY-056) or with a saw-like edge with triangular teeth (Falakro; 13GRS-012) up to 1mm long.

Crocus chrysanthus tunics ex Galičica

ISSN 2053-7557

Usually anthers in *Crocus chrysanthus* are entirely yellow or yellow with black tips of the basal lobes. Both variants can be found in almost every population of *C. chrysanthus* s.l. but there is one region where all plants earlier included in *C. chrysanthus* have black anthers. Such plants were for the first time mentioned by B. Mathew in a Crocus Group Bulletin in 1975 and he observed them N of Muğla. Later Brian supplied me with additional information on their whereabouts. During several trips when our team checked the mountains in this area we came across these crocuses in three localities and not one specimen with yellow anthers was found in those populations. Later I received identical plants collected by Norman Stevens from the Denizli region N of Muğla. So this means that the distribution of this crocus stretches from Muğla to Denizli.

Crocus muglaensis ex Denizli

ISSN 2053-7557

I decided to name this crocus after the province where it was first discovered and its main area - ***C. muglaensis***. It has the narrowest leaves of the entire complex, usually less than 1mm wide, rarely up to 1.5mm wide with a very narrow white stripe, just 1/5 of the width of the leaf. Corm tunics are coriaceous, split at the base in 4mm wide strap-like segments, the neck is very bristly, split in narrow, pointed, up to 5-10mm long segments. Basal rings are edged unevenly, with very small sparsely spaced triangular teeth. The flower tube is dirty greyish or brownish speckled on yellowish ground to dark brown. Sepals are 6-7mm wide and 14-21mm long, orange-yellow, always suffused brown on the outside, petals are 8-10mm wide and 13-20mm long, orange-yellow with a prominent brown “tongue” at the outer base. Filaments are yellow-orange, 7-10mm long; anthers invariably black, up to 13mm long, with long pointed basal lobes. Stigmatic branches are up to 7mm long, usually yellow, sometimes orange, ending well below the tips of the anthers.

Crocus muglaensis Rukšāns **species nova**

Diagnosis: A *C. chrysantho* antheris nigris bone differt.

Typus: Turkey, Prov. Muģla, 30km before Kale along rd. Muģla to Kale, alt. 940m. 09.03.2008 (R2CV-027). Holo: GB

Habitat: clearings in pine forest and inside dwarf shrubs (where it is guarded from sheep etc.) at altitudes of 800-1200m. Flowering period: February-March. Distributed at S end of Doğu Menteşe Dağlari and to the north up to Akdağ. 2n = 16 (Davis, 1984, as *C. chrysanthus* T. Baytop et al. 8353).

Crocus muglaensis R2CV-027

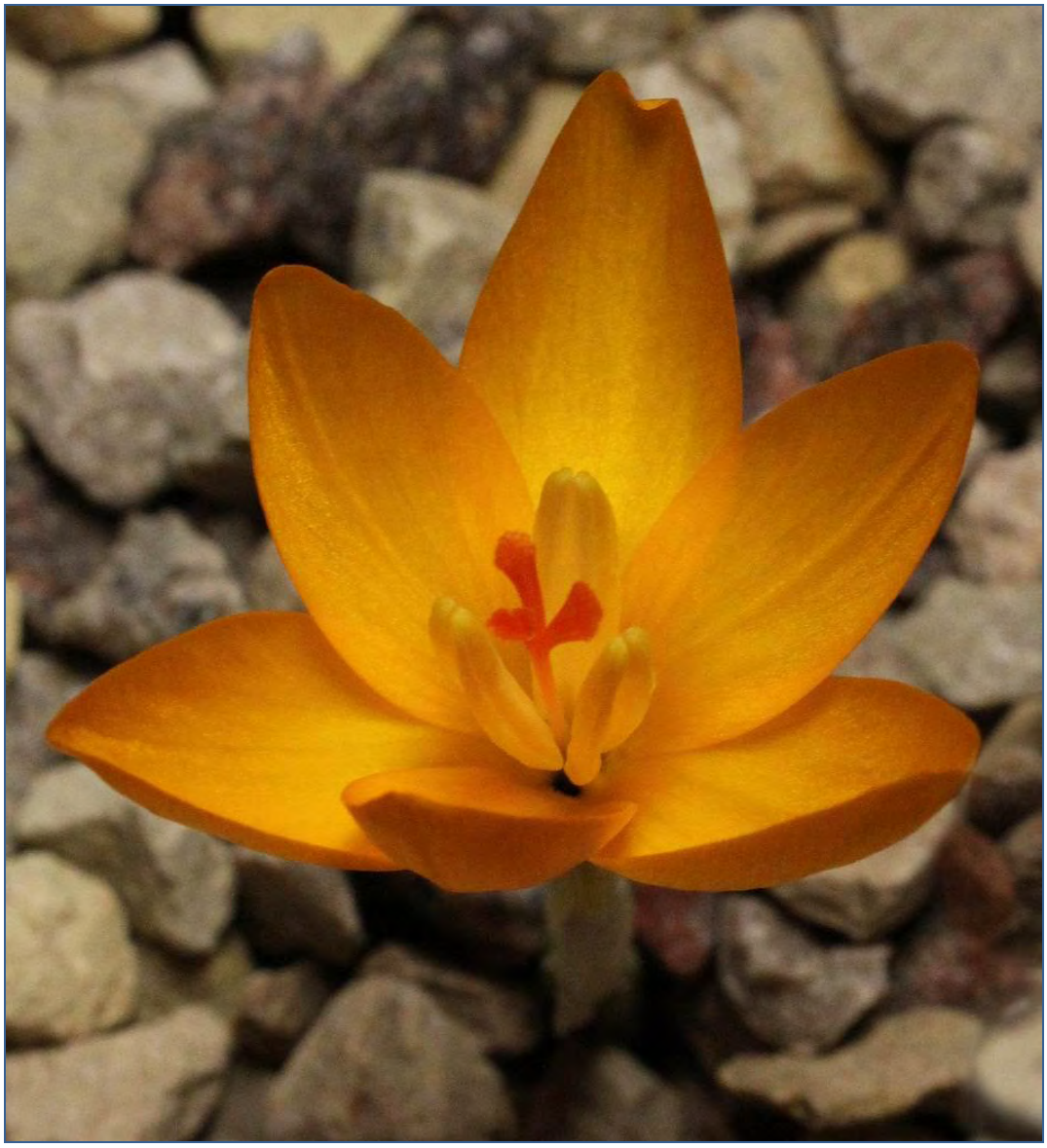
ISSN 2053-7557

It is very likely that it is identical with *C. chrysanthus* subsp. *kesercioglui* F. Candan & N. Özhatay described from Günlüce in 2013, but I have had no opportunity to compare them. During a visit to this area in 2014 all the plants had already finished blooming.

Crocus muglaensis R2CV-027

ISSN 2053-7557

One of the best-known wild forms in gardens (at least by the name) is the "*Crocus chrysanthus*" from the region near Uschak (Uşak). It was introduced into cultivation in 1973 by the Van Tubergen Company under the cultivar name 'Uschak Orange'. Unfortunately, the true plant is most likely extinct now with different clones or seedlings being grown in gardens under this name. This fact sparked my interest to visit the area and to find out what the real "*chrysanthus*" crocus from the Uschak region looked like and it turned out to be very special in several features. The most interesting was that all the plants observed (and I checked hundreds in a large area) had purple colouring deep in the throat, not so easy to perceive by a cursory look but well noticeable in split flowers. All the examined plants invariably had bright orange-yellow flower segments; rarely the sepals had pale brownish speckling on the outside. The flower tube was creamy, yellowish or greenish tinted. Sepals were 9-11mm wide and 16-21mm long, petals 9-10mm wide and 16-19mm long. Filaments were nude, up to 4mm long; anthers 11-20mm long, yellow with 2-2.5mm long basal lobes; the lobes were yellow or yellow with black tips. The stigma was yellow to orange, rarely white, divided into 3 to 4mm long branches, widening at the tips, generally ending right at the tips of the anthers, rarely exceeding them. Leaves were 1.5-2mm wide, with two ridges in each groove. The white stripe was narrow - around 1/5 of the leaf width. Corm tunics were hard, coriaceous with a 5-7-10mm long neck, formed by sharply pointed narrowly triangular tunic splits; basal rings were coriaceous with up to 1-2mm long, narrow, needle-like, well-separated teeth.



Crocus uschakensis, red stigma TULA-020

ISSN 2053-7557

Crocus uschakensis, white stigma TULA-020

Crocus uschakensis
basal rings

ISSN 2053-7557

Crocus uschakensis

We observed this species on low mountains N of Uschak where it was growing in unfarmed spots among sparse pine trees or in open situations, so I decided to name it ***Crocus uschakensis***. One can find plants with some purple deep in the throat in many populations (Greece, Macedonia, Manisa in Turkey etc.) but then other features are different.

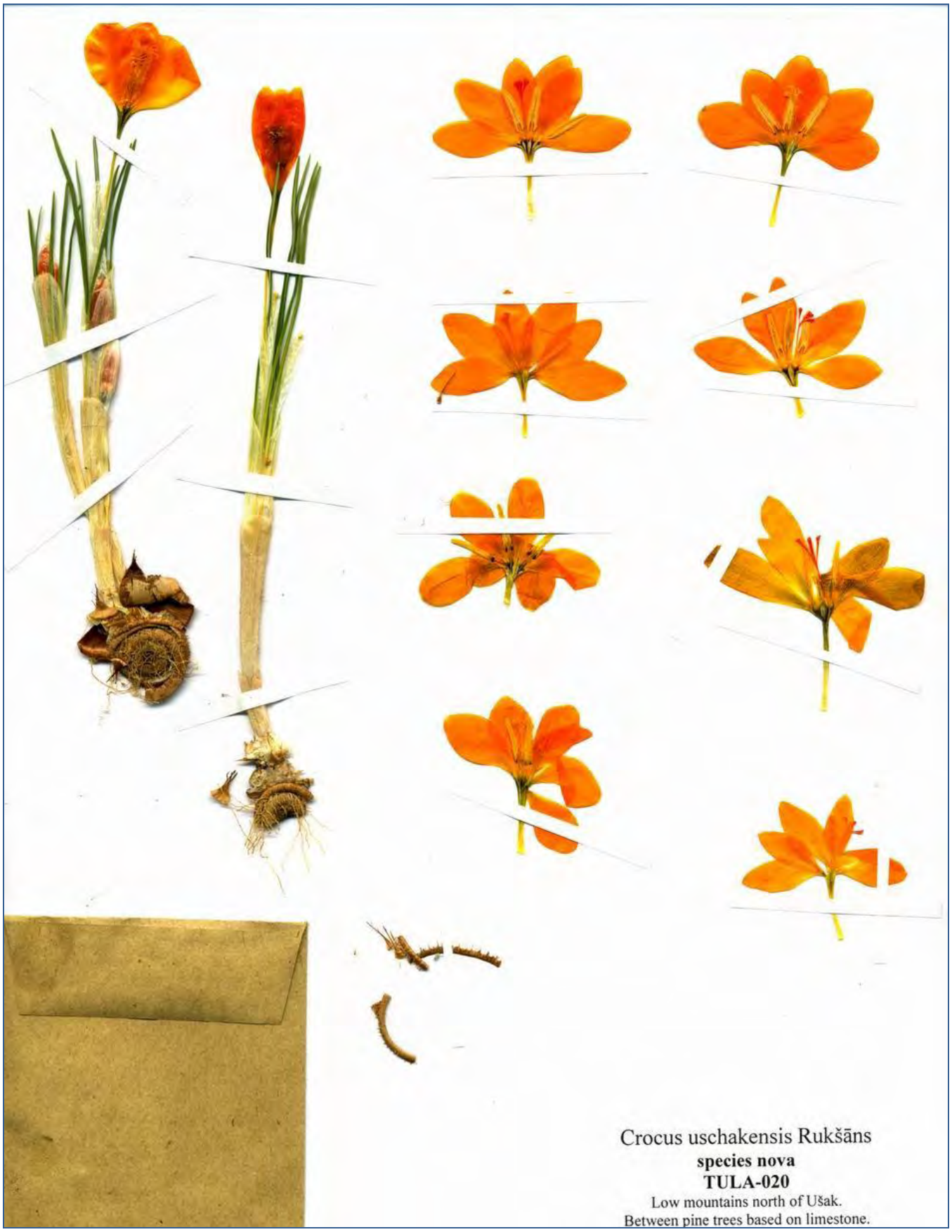
Crocus uschakensis

Rukšāns **species nova**

Diagnosis: A *C. chrysantho* faucibus purpurascentibus et antheris filamentorum 3-5 –plo longioribus bone differt.

Typus: Turkey, low mountains N of Uşak, 25-02-2011 (TULA-020).
Holo: GB.
Habitat: among pine trees based on limestone and on uncultivated grassy fields; altitude - 1300m. Flowering period: February-March. Known only from the type locality and the vicinity. 2n = 20 (Brighton, 1980 - for cv. 'Uschak Orange').

ISSN 2053-7557



Crocus uschakensis type herbarium sheet

The exact coordinates of type gatherings are attached to the type herbarium sheets, but are not listed here to protect populations in nature from over-collecting.

ISSN 2053-7557

Crocus henrikii – Gündoğmus

A third, well known, but not so widely distributed "*chrysanthus*" crocus was originally collected in 1988 by Henrik Zetterlund near Gündoğmus (Antalya province) in Turkey and named by him 'Gündoğmus Bronze', for the invariably bronze brown-speckled exterior of the petals. I visited this locality a number of times but always arrived there too late to see flowering plants and found only some random individuals

ISSN 2053-7557

in this heavily overgrazed area, but in 2012 I reached the locality just at the peak of blooming and this gave me the opportunity to do more thorough field research on the variability, allowing me to conclude that it was a different species, well separable from other populations of *Crocus chrysanthus* s.l. The observed plants were very uniform in colour having lighter or darker brown or greyish suffusion all over the backs of the sepals (4-7mm wide and 17-36mm long), rarely with a yellow margin; on the outsides of the tepals (4-8mm wide and 15-35mm long) at the base, there was always a prominent dark tongue of the same colour as on the sepals' exterior, up to 1/3 of the tepal length, rarely longer (sometimes prolonging as a narrow stripe reaching the tips of the segments). As a rule, all the observed plants had narrower petals than in other inspected populations of the *C. chrysanthus* complex and the flowers were unusually variable in size. Filaments were 5-10mm long, dark yellow, sometimes of a dirty shade; anthers of the same length or slightly longer, yellow with a creamy, greyish or greenish connective. Basal lobes were short (only ~1-1.5mm long), ending abruptly with rounded tips, rarely slightly pointed. Stigmatic branches were dark yellow, red to brownish red, ending at the middle of the anthers, rarely slightly higher. I observed only one specimen where they exceeded the anthers and one where they ended at the base of the anthers. Corm tunics were medium coriaceous with a 5-7mm long neck, formed by sharply pointed narrowly triangular tunic splits; basal rings were coriaceous with a somewhat uneven, almost smooth edge, or with very few short irregular needle-like teeth.

I decided to name it ***Crocus henrikii*** - for Henrik Zetterlund, curator of the living plant collection in the Gothenburg BG who was the first to draw my attention to this beautiful crocus. Plants of similar colour can be found in many populations of *C. chrysanthus* s.l., but *C. henrikii* can be easily separated by the shape of the anthers and by the narrow tepals which are around 4 times longer than wide.

Left: *Crocus henrikii* corm

Below: *Crocus henrikii, leaf cross-section*

[Ed. Note : s.l. = sensu lato - in a broad or general sense
s.str. = sensu stricto - in a narrow or strict sense]

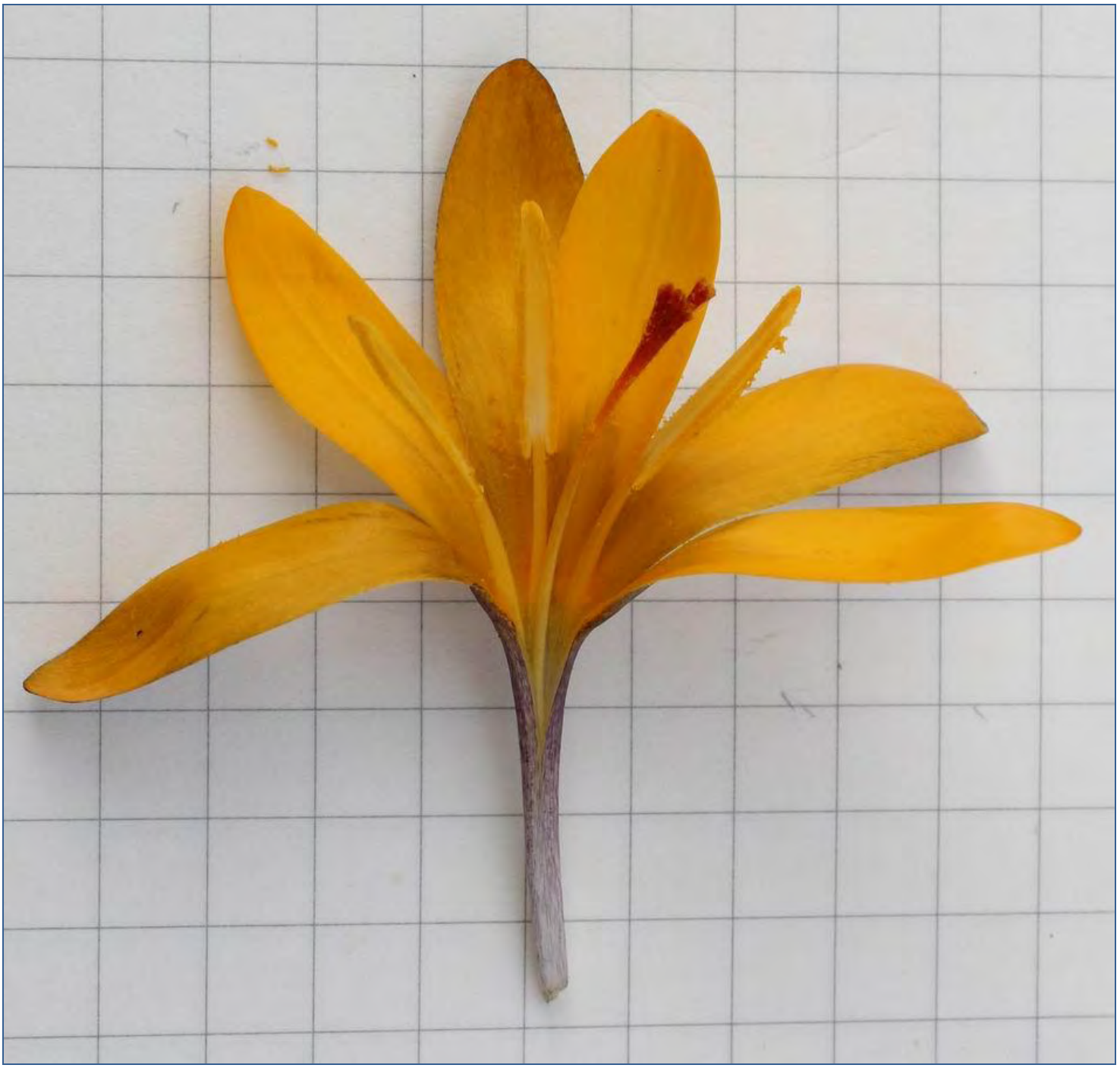
ISSN 2053-7557

We observed this species around Gündoğmus near Sogüt Dağ where it grew in light shade in sparse grass under large pine trees and dwarf deciduous oaks at altitudes of 900 to 1200m.

Crocus henrikii Rukšāns **species nova**

Diagnosis: Affinis *C. chrysantho* sed facile separabilis lobis basalibus antherarum 1-1.5mm longibus cum apicibus plus minusve rotundatis, et tepalis angustatis circa 4-plo longioribus quam latioribus.

Typus: Turkey, near Gündoğmus (Antalya province), 04-03-2012 (12TUS-022). Holo: GB.
Habitat: among pine trees and small shrubs based on limestone; altitudes - 900-1200m. Flowering period: February-March. Known only from the type locality and the vicinity. 2n =12 (Davis, 1984 as *C. chrysanthus* Allison & Ball 77/2).



Crocus henrikii

ISSN 2053-7557

Crocus henrikii Gündoğmus

Acknowledgments:

I am very grateful to Dr. Reinhardt Fritsch (Leibniz Institute of Plant Genetics and Crop Plant Research in Gatersleben, Germany) for his great assistance with writing Latin diagnoses and comments that helped to improve the article, and also to Henrik Zetterlund (Gothenburg Botanic Garden, Sweden) for the living material and the opportunity to work with the BG collections. Especially I'm thankful to my family for the help and patience and to my friends who accompanied me in travels and helped with the gathering of data in the field. J.R.

References:

Brighton, C. A., Scarlett, C. J., Mathew, B. 1980. Cytological studies and origins of some Crocus cultivars. Petaloid Monocotyledons. Linnean Soc. London., Academic Press. p. 139-159.
Candan, F., Özhatay N. 2013. *Crocus chrysanthus s. lato* (Iridaceae) in Turkey. Ann. Bot. Fennici. 50: 423-430.
Davis, P. H., ed. 1984. Flora of Turkey and the East Aegean Islands. Vol. 8. Edinburgh: University Press.
Jacobsen, N., Van Scheepen, J., Orgaard, M. 1997. The *Crocus chrysanthus - biflorus* cultivars. The New Plantsman. Vol. 4: 6-38.
Kerndorff, H., Pasche, E. 2011. Two new taxa of *Crocus* from Turkey. Stapfia. 95: 2-5.
Maroofi, H. 2002. Notes on the flora of Kurdistan province, Iran. The Iranian Journal of Botany. Vol. 9: 233-234.
Mathew, B. 1975. Turkish crocuses, 1975. Crocus Group Bulletin. Nr.1.
Mathew, B. 1982. The Crocus. A Revision of the Genus *Crocus* (Iridaceae). London: B.T. Batsford Ltd.
Maw, G. 1886. A Monograph of the Genus *Crocus*. London: Dulau & Co.
Özdemir, C., Akyol, Y., Alçitepe E. 2004. Morphological and anatomical studies on two endemic *Crocus* species of Turkey area. Pak. J. Bot., 36(1): 103-113.
Ranđelović, N., Sekovski, Ž., Dimeska, G. 2007. Systematic horological and genetic research into the genus *Crocus* L. in Macedonia. Collection of Papers Devoted to Academician Kiril Micevski. p. 98-131.

 ISSN 2053-7557

Crocus brachyfilus I. Schneider - a new crocus species in series *Speciosi* B. Mathew : **A comment by Janis Rukšāns, Dr. biol.**

Not long ago only 3 different crocus taxa from series Speciosi were known – the type subspecies from Georgia, and another two described by Brian Mathew from Turkey - subsp. *ilgazensis* and subsp. *xantholaimos*. Later I described subsp. *archibaldiorum* from Iran and subsp. *ibrahimii* from Turkey in Europe and quite recently four another of this series from Greece and Turkey. That was followed by *C. striatulus* Kerndorff & Pasche from NE Turkey (2013) and very recently by *C. brachyfilus* I. Schneider from Central Turkey (2014) with its locus classicus somewhat north from my *Crocus elegans* (subsp. *elegans*).

Crocus archibaldiorum WHIR-129

ISSN 2053-7557

Crocus ibrahimii

They all are well separable by morphological features although I also observed the feature used for the naming of *Crocus striatulus* (very narrow median stripe on leaf surface) in *C. abantensis* (subsp. *abantensis*). So other morphological features must be searched for to separate *C. striatulus* from other species of this series (its status was clearly supported by DNA research).

ISSN 2053-7557

Crocus elegans

Crocus elegans corm

In my description of *C. elegans* (subsp. *elegans*) it was mentioned that it has white anthers. This was not supported during a repeated visit to the *locus classicus* in autumn 2013. The later observation confirmed my earlier hypothesis that the white colour of anthers was caused by a failure in development and really the anthers are yellow.

When I described new taxa *in C. speciosus* s.l. complex, I used type herbariums gathered at blooming time, so several foliage characteristics, not visible in autumn, were not included. That was noted by Kerndorff et al. (2013). I revisited the type locality of *C. elegans* only in spring 2014 and then noted that most of plants there have 2 leaves, 3-4 leafed plants formed a minority. At that time it was not possible to judge which of them were of flowering size, so the main features separating *C. elegans* from *C. brachyfilus* remain in corm and flower indications.

ISSN 2053-7557

Ingo Schneider in his recent publication wrote: “Recently Rukšāns (2012, 2013) published a revision of *C. speciosus* M. Bieb., the type species of *C*. ser. *Speciosi* B.Mathew. He split *C. speciosus* from formerly three into nine “subspecies”, which cannot be accepted. Instead they should be raised to species level. In fact, it seems that Rukšāns already did this himself (Rukšāns 2014).”

I completely agree with I. Schneider that it was my mistake when I was too cautious describing those new taxa at subspecies level. In this I followed the great authority in the genus Crocus, Brian Mathew.

İbrahim Sözen picturing *Crocus ibrahimii*

ISSN 2053-7557

As my corrections to my naming were made only in my catalogue, they cannot be accepted in accordance with the rules of the International Code of Nomenclature for algae, fungi and plants. Those names, according to the Code, are corrected here.

Crocus archibaldiorum **(Rukšāns) Rukšāns status nova**. Syn. *Crocus speciosus* subsp. *archibaldiorum* Rukšāns. The Alpine Gardener; 80: 209 (2012).

Crocus ibrahimii **(Rukšāns) Rukšāns status nova.** Syn. *Crocus speciosus* subsp*. ibrahimii* Rukšāns. The Alpine Gardener; 80: 210 (2012).

Crocus sakariensis **(Rukšāns) Rukšāns status nova**. Syn. *Crocus speciosus* subsp. *sakariensis* Rukšāns. The Alpine Gardener; 81: 188 (2013).

Crocus bolensis **(Rukšāns) Rukšāns status nova**. Syn. *Crocus speciosus* subsp*. bolensis*. The Alpine Gardener; 81: 188 (2013).

Crocus hellenicus **(Rukšāns) Rukšāns *status nova***. Syn. *Crocus speciosus* subsp*. hellenicus.* The Alpine Gardener; 81: 190 (2013).

Crocus elegans **(Rukšāns) Rukšāns status nova**. Syn. *Crocus speciosus* subsp. *elegans*. The Alpine Gardener; 81: 190 (2013).

Similar changes may be done with the status of *Crocus speciosus* subsp. *ilgazensis* and subsp. *xantholaimos*, which certainly must be regarded at species level, but I will leave this to Brian Mathew, who originally described them.

References:
Kerndorff H., Pasche E., Blattner F. R. & Harpke D. 2013: A new species of Crocus (Liliiflorae, Iridaceae) from Turkey. – Stapfia 99: 141 – 144.
Mathew, B. 1982. The Crocus. A Revision of the Genus Crocus (Iridaceae). London: B.T. Batsford Ltd.
Rukšāns J. 2012: A revision of *Crocus speciosus* in Turkey and Iran. – Alpine Gardener 80: 206 – 211.
Rukšāns J. 2013: Seven new crocuses from the Balkans and Turkey. – Alpine Gardener 81:188 – 193.
Rukšāns J. 2014: Rare Bulb Nursery, Latvia. Catalogue. – Published at http://rarebulbs.lv/index.php/en/ catalogue.
Schneider I. 2014: *Crocus brachyfilus* (Iridaceae), a new species from southern Turkey. - Willdenowia 44: 45-50.

Further photos of the *Crocus* species redefined above .....

Crocus sakariensis

ISSN 2053-7557

Crocus bolensis

Crocus bolensis - white form

Crocus hellenicus

Crocus elegans

ISSN 2053-7557

Most likely there will be several more new species from series Speciosi described in future. Several isolated populations of *Crocus speciosus*-like crocuses in west and central Turkey are known. Personally I have observed some very special and different looking allied taxa in Armenia etc. J.R.
These are some photographs of various *Crocus* in Armenia which may be new species :

In nature in Armenia

ISSN 2053-7557

We thank Jānis for supplying these photos of flowers from Armenia which he regards as likely to be new species.

Jānis documents the plants in his collection and has also often shared news of his trips to see plants in the wild with many thousands of readers in the SRGC forum.

These include a very recent trip to Armenia in early April 2014.

In October 2013 he travelled to the Crimea with Dr Dimitriy Zubov of the National Academy of Sciences in Ukraine, who is another forum contributor, then to Armenia with tulip grower and fellow forumist Zhirair Basmajyan and briefly to Georgia – this is one of many forum threads from Jānis.

We are fortunate to have so many experts and enthusiasts sharing their experiences so freely on the internet.

More Armenian *Crocus.*

ISSN 2053-7557