CROCUS SPECIES from A to Z
1. **Crocus abantensis** T.Baytop & B.Mathew


- **Habitat and distribution** – until recently it was known only from the *locus classicus* where it blooms near melting snow on mountain meadows amongst prostrate *Juniperus* and in open spots in low pine forests together with *Crocus ancyrensis* s.l. at 1100-1350 m altitudes. Not long ago this species was discovered by Turkish amateurs on the heights W of Abant over Sakarya (I. Sözen).
- **Flowering time** – April.
- **Corm** – subglobose, up to 10 mm in diameter (in cultivation up to 22 mm).
- **Tunics** – finely fibrous and conspicuously reticulated.
- **Prophyll** – absent.
- **Cataphylls** – papery, white, usually 2-3.
- **Leaves** – 5-10, glabrous, green, up to 1 mm wide, lateral channels without ribs, the white stripe around 1/3 of the leaf diameter or slightly less; shorter than the flowers at blooming time.
- **Perianth tube** – white, bluish or yellowish, sometimes at the top darker striped, rarely dark bluish (in darker forms).
- **Bract and bracteole** – silvery white, membranous, subequal, broad and peaky at the top.
- **Throat** – glabrous, dark yellow, rimmed with an indistinct lighter or whitish zone, although well separated.
- **Filaments** – 5 mm long, scabrid, yellow.
- **Anthers** – 8-14 mm long, yellow.
- **Connective** – somewhat lighter than the anthers.
- **Style** – orange, divided into three branches, usually ends below the tips of the anthers, rarely equal or slightly surpasses them.
- **Outer segments** – 22-37 mm long, 7-15 mm wide, obovate to oblong-oblanceolate, obtuse to subacute, mid to deep blue, sometimes violet tinted both on the outside and inside.
- **Inner segments** – more or less equal to outer segments.
- **Capsule** – cylindrical, up to 15-20 mm long and 6-8 mm wide, buff, staining purple at the top, carried at ground level at maturity.
- **Seeds** – distinctly elongated, acute, 3 to 4 mm long and 1-1.5 mm wide, dark reddish brown, even blackish, with an inconspicuous or very small caruncle and without raphe.

2n = 16.

**Etymology** – named after Lake Abant, near which it was found.
Crocus abantensis is quite distinct from all the other species with blue flowers and reticulated corm tunics. Close by grow the bright yellow C. ancyrensis and the autumn-blooming C. bolensis. In the same area are distributed (although I haven’t seen them growing together) the similarly coloured species from the C. biflorus group earlier regarded as C. pulchricolor, later described as C. zetterlundii, and one other golden species – C. olivieri. Just the overall resemblance to “C. pulchricolor” was the main reason why C. abantensis was for such a long time overlooked in this well-visited area, but any doubts about their identity disappear as soon as corms are seen, because their tunics are very dissimilar. The closest locality where I observed C. zetterlundii was in the same ridge some 30 km further, at approximately the same altitude, but no C. abantensis was seen there.

It flowers shortly after the snowmelt and at this time the weather can be very changeable. In spring 2007 I visited the heights over Lake Abant on the 11th of March and then C. abantensis and C. ancyrensis were in full bloom, though on the slopes there was still much snow. Two weeks later I again visited these places and this time everything was in deep snow, with only here and there some crocus “noses” pushing through. In 2008 our team happened to be there on the 20th of March, at the very beginning of flowering.

There are spots where C. abantensis dominates, in other places only C. ancyrensis grows, but mixed groups are not a rare occurrence. Regardless of the differing chromosome numbers, both sometimes hybridize (but that happens very rarely) and their offspring were described as C. x paulineae. In 2008 after a very long search I spotted only one plant, and another I got in cultivation, hand-pollinating both species, as the seed parent using the lilac form of C. abantensis.

In colour Crocus abantensis is quite variable, although blue-coloured forms prevail; rather rare are white-blooming specimens; violet shaded flowers occur more often. One very unusual form with striped flowers, which appeared among my seedlings from wild-collected seeds, I named after a character from the Harry Potter series as ‘Azkaban’s Escapee’ for the resemblance with the prisoner pyjamas in the past.

It seems that Crocus abantensis is one of the very few species that do not like growing in the greenhouse. There I have never gotten as large and good quality corms as I would have liked. It feels much better in the garden where excellently sets seed and abundantly self-seeds on the paths between beds, so with me it had become almost like a weed, until I completely lost the garden stock during the winter when a very mild January was followed by two weeks with hard black frosts (in 2006). Survived only potted seedlings and small stocks in the greenhouse. Therefore I don’t risk anymore. I try to bring all the pots outside as early as possible because this alpine species from NW Turkey does not like high temperatures. It well increases by splitting.
2. **Crocus abracteolus** Kernd. & Pasche

Stapfia 99: 147 (2013). Type: Turkey, Cilician Taurus, Mersin Province, Bolkar Dağları. 19.03.2010, HKEP-1040; GAT 7169. Ic.: l.c. Fig 1 i-1.

- **Habitat and distribution** – known only from the type locality high in the Bolkar mountains where it grows on alpine meadows exclusively on calcareous soils together with *Iris danfordiae*, *Juniperus*, *Acantholimon*, etc., at altitudes of 2100-2400 m.
- **Corm** – globose, up to 12-15 mm in diameter.
- **Tunics** – coriaceous, splits into 2-5 mm broad segments, no sub-splits.
- **Tunic neck** – 3-7 mm long, bristly at the top, composed of narrow-based, prolonged triangles, which end abruptly in very thin fibres.
- **Basal rings** – usually coriaceous, pronged at the edge, or minutely toothed with many very short teeth, less than 0.5 mm long.
- **Prophyll** – absent.
- **Cataphylls** – silvery white, brownish at the tips.
- **Leaves** – 4(!)-6, glabrous, grey green, 1-2(3) mm wide, with (2)3 ribs in lateral channels, the white stripe around 1/3 of the leaf width; erect, shorter or equal to flowers at blooming time.
- **Perianth tube** – white, bluish or light violet in the upper part.
- **Bract and bracteole** – bract silvery, skinny, tubular, with two peaks or points; bracteole absent (hence the name).
- **Throat** – deep yellow to orange, glabrous.
- **Filaments** – 3-5-5.5 mm long, yellow, nude.
- **Anthers** – (6.5-)8-9(-11) mm long, arrow-shaped, yellow.
- **Connective** – colourless to light yellow.
- **Style** – dark yellow to orange, 3-branched, branches (4-)6(-8) mm long, not much expanded at the apex, mostly longer than or equal to the anthers, rarely (12%) shorter.
- **Outer segments** – (17-)22(-27) mm long, (5-)8(-10) mm wide (segment ratio 2.8); outside white, rarely suffused blue, with a variable mixture of pale to deep violet speckles, veins and feathering; inside white.
- **Inner segments** – (16-)20(-24) mm long, (5-)8(-11) mm wide; outside white, rarely towards the tube with a brown spot, sometimes surrounded bluish; inside white.
- **2n = 10.**
- **Etymology** – the name means ‘without a bracteole’ – rather unusual among the “biflorus” crocuses.

I have never had this recently described species therefore used the data from the original paper. The locality on the map is roughly depicted. Phylogenetically its closest ally is the very distant *Crocus tauricus* from Crimea and both belong to series *Isauri*. The two “peaks” at the tip of the bract allow to suggest that they developed by coalescing of the bract and bracteole.
**Crocus adamii** J.Gay  

- **Synonyms** – *C. biflorus* subsp. *adami* (J.Gay) K.Richt., *C. biflorus subsp. adamii* (Gay) B.Mathew (pro parte).
- **Habitat and distribution** – here under this name are included only the populations from Georgia. It is described from the surroundings of Tbilisi, Georgia, growing on grassy slopes and on mountain steppe as well as among shrubs and on stabilised rubble at altitudes of 750-2900 m (Gabrielian, 2001).
- **Flowering time** – February-May.
- **Corm** – depressed-globose, 15-20 mm in diameter.
- **Tunics** – outer coriaceous, inner membranous.
- **Tunic neck** – bristly, comparatively long (up to 8 mm), with a few secondary splits.
- **Basal rings** – present, edge almost smooth, with minor, saw-like, somewhat uneven in length teeth.
- **Prophyll** – absent.
- **Cataphylls** – 3, silvery.
- **Leaves** – 3-4(-6 in cultivation in Armenian samples), glabrous, greyish green, 1.5 to 2 mm wide, with 1-2 ribs in lateral channels, the white stripe 1/5(-1/3) of the leaf width; below the flower at anthesis. In *Flora of Armenia* the number of leaves is given up to 9, but I have never seen plants with that many leaves.
- **Perianth tube** – white or white with darker stripes (more often in Armenian plants), sometimes uniformly dark (in Georgian samples).
- **Bract and bracteole** – silvery, almost equal in size.
- **Throat** – minutely hairy or nude, usually deep yellow, sometimes surrounded by a white, radiating, broader (Nakhchivan) or narrower (Armenia) zone.
- **Filaments** – (3-)4(-5) mm long, glabrous, creamy to yellow.

Observed localities where *C. adamii* occurs (green mark - epitype locality, red marks - other observed localities in Georgia and Armenia, yellow marks - insufficiently known populations in Nakhchivan and in the very S of Armenia).
The concept of *Crocus adamii* has been changed dramatically recently. When B. Mathew worked on his monograph, it was assumed that its area stretched from Bulgaria to Iran. Now it is drastically reduced but still an extensive research is needed to define the borders where this epithet can be applied. (H. Kerndorff and E. Pasche have described new taxa from this complex and are planning to continue this course.) The type locality (a specimen at Kew) according to Mathew is marked as “Habitat in Tauria et Iberia” (i.e. Crimea and Georgia). That cannot be correct as the Crimean plants belong to another, very distinct taxon – *C. tauricus*. G. Maw, who regarded *C. adamii* as a variety of *C. biflorus*, noted that it was an “eastern representative of this species from Georgia” . *Flora of the USSR* states that the type specimen comes from Georgia, the surroundings of Tbilisi (the type in St. Petersburg). Similar viewpoint was expressed by A. Grossheim in his *Flora Caucasica*, where as the locus classicus was indicated Tbilisi and on the distribution map (No. 228) was located only in Georgia (not entering the west of Georgia, Abkhazia and the Russian Caucasus to the west of Ossetia), Armenia, Azerbaijan and Iran. Here I regard the Caucasian forms as belonging to *C. adamii*; several samples that I collected in Iran turned out to be sufficiently different and later were described as new species (see CC. *gutae*, *iranicus* and *reinhardii*).

I collected the Georgian *Crocus adamii* in 1978 near Kus Tba (Cherepashye/Turtle) Lake in the outskirts of Tbilisi. Unfortunately, the collected stock was later ravaged by rodents. When I revisited this locality in 2007, 2010 and

- **Anthers** – 2-3 times longer than the filaments, yellow, arrow-like, with abruptly pointed tips, basal lobes short.
- **Connective** – creamy.
- **Style** – yellow to orange, divided into 3 branches, usually ends at the tips of the anthers, rarely exceeding them (in samples from Armenia).
- **Outer segments** – (20-)28(-35)mm long and (7-)10(-13)mm wide, sometimes with slightly pointed tips; outside lighter or darker lilac blue, edged with a diffused lighter margin, occasionally buff, with 3-5 darker stripes, sometimes confluent, especially at the base; inside somewhat lighter blue, sometimes with whitish stripes up to the tips (especially in darker forms).
- **Inner segments** – a little shorter (<1mm) and of the same width, slightly lighter in colour, without prominent stripes on the outside, but usually with a dark blotch at the base, which sometimes radiates towards the top; inside of the same colour as the outer segments.
- **Capsule** – cylindrical, up to 17 mm long and 7 mm wide, buff coloured, positioned from ground level to up to 2 cm high at maturity.
- **Seeds** – up to 2 mm in diameter, +/- round, dark reddish brown, with a large, prominent caruncle and an almost indistinct raphe.
- **2n = 10** (Pogosyan, 1981 – cited according to *Flora of Armenia*).
- **Etymology** – named after the Russian botanist M.F. Adam, later J.F. Adams (1780-1838) who worked in St. Petersburg and explored the Caucasus.

The plants observed near Vanadzor in Armenia had following dimensions:

- **Outer segments** – 18-24-35 mm long and (6-)8-9(-13) mm wide (n=29).
- **Inner segments** – (17-)22-23(-33) mm long and 6-9-14 mm wide (n=29).
- **Filaments** – (3-)4-5(-6) mm long (n=26).
- **Anthers** – (6-)8-9(-13) mm long (n=26).
- **Style** – shortly below the dividing point papillose, divided into 3 glabrous, (3-)6-7(-15) mm long branches.
2013, no \textit{C. adamii} was to be seen there. The habitat was completely destroyed and I found only a few \textit{C. speciosus} individuals at some distance from the lake, although in 1978 the leaves of this crocus covered the ground below pine-trees like grass. Now there were asphalted footpaths and a large sporting and recreation centre. In 2007 our team, guided by Dr. Kereselidze Dzhimsher, former Director of the Tbilisi Botanical Garden (now The National Botanical Garden of Georgia), explored several localities around Tbilisi, but no \textit{C. adamii} was found. In 2010 we had more luck. Then under guidance of Dr. Shamil Shettekauri from the Botanical Institute we found \textit{C. adamii} in two localities: near Igoeti some 40 km NW of Tbilisi (CMGG-021), where it was growing in clearings and open spots among deciduous shrubs, and in Gareji steppe (CMGG-031) around 100 km from Igoeti (SE of Tbilisi) in a very different habitat – in dense grass of steppe in an open situation. Here to characterise \textit{C. adamii} was used sample CMGG-021 from Igoeti that grew in habitat very similar to that from near Tbilisi observed in 1978.

My other gatherings are from several localities in Armenia. One with the largest flowers I got from Arnis Seisums, who collected it during the Soviet era on the Bichenek Pass on the border between Nakhchivan and Armenia, at 2350 m altitude. Nakhchivan is an exclave of Azerbaijan, bordering on Armenia, Iran and Turkey. The flowers are blue or violet, tinted or striped darker, but in general similar to other Armenian forms. The plants from Tashir (Armenia) are uniformly blue without stripes on the flower segments, very similar to Georgian specimens.

On Mount Arteni in Armenia was observed a very large abundantly blooming population with small pure white flowers (in herbarium turning dark blue), very narrow anthers and a style divided only at the very top with no widening in the tips. This probably is a new crocus. In spring 2014 when I visited Arteni, there not long ago had snowed and only a few spots and south-facing slopes were uncovered where I found merely more or less typical specimens of \textit{Crocus adamii}. In 2016 I was there 2-3 weeks too late (the spring there was very early that year) and everything was so heavily grazed that not a single crocus was to be found.

Near the Geghard monastery were found samples of a "\textit{C. adamii}" which bloomed in autumn and formed leaves in spring when they appeared together with seed capsules. From there was described \textit{C. geghartii} (see).

\textit{Crocus adamii} is very easy in cultivation. It grows equally well both in the garden and in pots under cover. The pots I take during the warm spells in summer outside, as it does not need a hot and dry rest, although it does not mind if is left in the greenhouse.
4. *Crocus adamioides* Kernd. & Pasche


- **Habitat and distribution** – grows on slopes in open woods and at forest edges in grass at altitudes of 900-1100 m, in the north westernmost corner of Turkey in Europe.
- **Flowering time** – February (sometimes around the end of January) – March.
- **Corm** – up to 1.5 cm in diameter, subglobose.
- **Tunics** – outer tunics coriaceous, inner ones softer.
- **Tunic neck** – bristly, up to 5 mm long, split in broad segments.
- **Basal rings** – upper rings toothed with up to 1 mm long, clearly separated teeth, lower ones with slightly pronged edges.
- **Prophyll** – absent.
- **Cataphylls** – silvery white to brownish, in my samples – invariably tinted light buff.
- **Leaves** – (2-)3(-4), usually glabrous, rarely slightly ciliated on margins and lamina, dark green, usually 1 mm wide, rarely a little broader (up to 2 mm – in cultivation), with 1(2) ridges in lateral channels, the white stripe less than 1/3 of the leaf width; reaching the flowers at anthesis or even surpassing them.
- **Perianth tube** – whitish, becoming striped or violet towards the apex.
- **Bract and bracteole** – whitish, sometimes brownish at the tips, skinny.
- **Throat** – glabrous, deep yellow to orange.
- **Filaments** – (2-)3(-6) mm long, glabrous, yellow.
- **Anthers** – (6-)9(-12) mm long, yellow, broadly arrow-shaped, with short basal lobes and obtuse tips.
- **Connective** – wide, colourless or white.
- **Style** – divided into three branches, fringed at the top, orange-red, usually well overtops the anthers, occasionally ends at the same level or slightly below the tips of the anthers (observed by me in two specimens out of 30).
- **Flower segments** – plain white to lilac.
- **Outer segments** – (15-)19(-25) mm long and (6-)9(-13) mm wide; outside whitish, lilac or blue, at the base usually a dark spot, sometimes extending to the segment tips, rarely with 3 dark wide stripes along the back of the segments.
- **Inner segments** – (14-)18(-24) mm long and (7-)10(-14) mm wide, outside white or lilac with a brownish basal spot, in darker coloured specimens with a very distinct, dark, sharply edged blotch (not mentioned in the original description).
- **Capsule** – up to 14-20 mm long and 6-7 mm wide, purplish brown, carried 2-5 cm above ground at maturity.
- **Seeds** – elongated, 3-3.5 mm long and 1.5-2 mm wide, brown with a very prominent lighter caruncle and raphe.
- **2n** = 16.
- **Etymology** – the name means “*adamii*-like”.

**Distribution area of C. adamioides** (on the right HKEP-0904, on the left – own gathering).

*C. adamioides* corms.
This plant was regarded by Mathew (1982) as *Crocus biflorus* subsp. *adamii*, but phylogenetic research showed that it is very distant from both *C. adamii* and *C. biflorus*, and is closer to the species from W Asiatic Turkey, such as *C. danfordiae*, *C. pulchricolor*, and some others, although in overall appearance it looks more like *C. adamii* (Kerndorff et al., 2012).

The mountain ridge where it was found partly continues into the adjacent Bulgaria, and *Crocus adamioides* can be found there, too. There are no gatherings pertaining to the *biflorus* group within the material of the Greek flora from the territories neighbouring with Turkey. Crocuses that I got from Christopher Greenwell collected wild in Bulgaria as *C. adamii* look somewhat similar to the one H. Kerndorff & E. Pasche described as *C. adamioides*. In the materials on the Bulgarian flora I found that only *C. biflorus* s.l. occurs all over the country. Comparing with the Turkish *C. adamioides*, Bulgarian plants generally have more pointed flower segments and the stigmatic branches more often end below the tips of the anthers. The proportions between the lengths of the filaments and anthers in the Bulgarian plants are different; in the majority of the observed (in 26 out of 30) specimens they were of the same length. The basal rings are different, too. In the type *C. adamioides* the teeth are set closely, whereas in the Bulgarian plants they are either separated by ~2 mm wide intervals, or the teeth are minute. Leaves of *C. adamioides* are dark green, whereas in the Bulgarian plants bluish to greyish green. Most likely the latter can be regarded as a different species. They are very variable in colour and one observed specimen looked almost indistinguishable from *C. alexandri* except it had a yellow throat and different corm tunics.

I grow one sample that was collected in Serbia and is believed to be *Crocus adamii*. It certainly is not *C. adamii*, but it is too early to say whether it is *C. adamioides* or not. It blooms later and has bluish green leaves. Most likely it is another species, as it grows much further away. Its chromosome count is 2n=18 (Ranđelović et al. 1990, 2007) – differing from both *C. adamii* (2n=20) and *C. adamioides* (2n=16).

My plants of *Crocus adamioides* were collected at somewhat lower altitudes than is indicated by the authors – at 400-600 m. Bulgarian specimens I planted outside and they overwintered well, but with the Turkish plants I didn’t risk as they come from quite a low altitude with a fairly mild climate. This species is very ornamental with a high horticultural value; it grows well in pots which I keep in the greenhouse during the summer. It readily sets seed and increases by splitting.
Crocus adanensis T.Baytop & B.Mathew


- **Habitat and distribution** – known only from a very few spots in Adana Province, at 750-1500 m altitudes. Samples grown by me were collected on limestone-based slopes near the edges of Carpinus forests and in clearings in Carpinus, Fagus, Juniperus and Quercus forests.
- **Corm** – ovoid, up to 15 mm in diameter.
- **Tunics** – membranous, splitting into parallel strips or fibres.
- **Basal rings** – usually absent, occasionally poorly developed, though I haven’t seen such plants.
- **Prophyll** – absent.
- **Cataphylls** – 3-4, papery, white, with more or less distinct veins.
- **Leaves** – 2-3(-4), glabrous, grey green, 1.5-2.5 mm wide (up to 4 mm in cultivation), lateral channels without ribs, the white stripe 1/3 or more of the leaf width; usually below flowers at anthesis, rarely reaching them at blooming time. Contrary to the statements of B. Mathew that they are equal or exceeding the flowers, I have never observed that in cultivated plants.
- **Perianth tube** – white, only at the very top slightly greyish shaded.
- **Bract and bracteole** – well exserted, silvery white, distinctly unequal – the bract markedly broader, enclosing the narrowly linear bracteole.
- **Throat** – glabrous, usually white, sometimes with a slightly yellow shaded middle zone and with a sharply defined toothed upper edge, very rarely yellow with a wide white edge.
- **Filaments** – 3-4 mm long, white or yellow, glabrous.
- **Anthers** – twice as long as the filaments (7-9 mm), yellow.
- **Connective** – whitish, sometimes greyish shaded.
- **Style** – bright orange to red, divided into 3 slender branches without widening at the tips, sometimes very shallowly secondary divided, usually well exceeding the anthers.
- **Flower segments** – narrowly obovate to sublanceolate, obtuse to subacute or with pointed tips, inside light lilac blue.
• **Outer segments** – 2-2.5 cm long and 0.4-0.7 mm wide, outside silvery or buff coloured, sometimes slightly yellow shaded, speckled grey or violet at the base.
• **Inner segments** – almost the same size as the outer, maybe only a little shorter; colour the same both on the outside and the inside (only at the edges slightly lighter).
• **Capsule** – ellipsoid, up to 10-17 mm long and 4-7 mm wide, straw coloured, staining light lilac near the tip, rounded with a short but distinct peak at the very top, positioned at ground level at maturity.
• **Seeds** – deep reddish brown, ellipsoid to rounded, 3-4 mm long, with a prominent pointed caruncle of the same colour and a very insignificant to absent raphe.
• $2n = 14$.
• **Etymology** – named after Adana Province in Turkey where it is distributed.

I haven’t seen *Crocus adanensis* in the wild. My acquisitions were originally collected by O. Sonderhousen (OS-1024) and during the KPPZ expedition organized by the Gothenburg Botanic Garden (KPPZ-9053). Both are very similar and generally well match the original description. OS-1024 has a more prominent deep yellow mid-zone in the throat, and the throat is surrounded by a wide, starry, pure white, sharply defined outer border of the same type as in the specimens with a pure white or creamy shaded throat. The coloration of the seedlings is intermediate between the two forms, thus displaying a normal variability and no hybridisation traces with other species. Genetically it is close to *C. paschei*, but is easily separable by the throat colour.

*Crocus adanensis* is not very difficult in cultivation if you keep in mind that it comes from an area with comparatively mild winters and hot and dry summers. Taking this into account, I don’t intend to grow it in the open garden; in the bizarre winter when frosts returned after a long warm spell in the middle of the season, it suffered more than other species even in the greenhouse. After cross-pollination of both stocks, it well sets seed.
6. **Crocus aerius** Herbert  
Ic.: B. Mathew. Crocus, t. 52 (e Maw); J. Rukšāns. Crocuses, pl. 139.

- **Synonym** – *C. biliottii* Maw.
- **Habitat and distribution** – occurs at higher elevations, in turf on alpine meadows, known from the Zigana and Soğanlı passes, at altitudes of 2000-2800 m, in Trabzon Province, NE Turkey.
- **Flowering time** – right after the snowmelt in May and June.
- **Corm** – ovoid, up to 15 mm in diameter.
- **Tunics** – membranous, split at the base into narrow, parallel bands, giving an impression of a somewhat fibrous appearance.
- **Tunic neck** – up to 10-15 mm long, formed by long triangular splits.
- **Basal rings** – absent.
- **Prophyll** – absent.
- **Cataphylls** – usually 3, membranous, white.
- **Leaves** – 2-3-6, glabrous to sparsely ciliated at margins (plants from the Soğanli pass), grey green, up to 3 mm wide, with 2-3 prominent ridges in lateral channels, the white stripe 1/3-1/2 of the leaf width; just emerging or less often reaching the base of the flower at blooming time.
- **Perianth tube** – white, in the upper part more or less blue or violet striped, sometimes the stripes restricted to the tube and yet present even in specimens with a white segment colour.
- **Bract and bracteole** – large, subequal, silvery white.
- **Throat** – glabrous, pale yellow to yellow, usually surrounded by a white zone. On the Soğanlı pass I saw only specimens with very light-coloured throats, whereas among specimens from the Zigana pass more often were found plants with a much darker throat colour – almost orange-yellow, nearly always surrounded by a stary white zone; sometimes the white rays are very long and reach the segment tips, or the segment colouring seems white with lilac stripes.
- **Filaments** – (2-)4-6 mm long, glabrous, white or pale yellow.
- **Anthers** – at least twice the length of the filaments – (7-)10-14 mm, yellow.
- **Connective** – creamy to light yellow, wide.
- **Style** – divided into three deep orange-red or yellow-orange branches, shallowly lobed at the distinctly widened tips, usually ends below the tips of the anthers, rarely levelling them.
- **Flower segments** – 20-35 mm long and 8-16 mm wide, obovate, obtuse or rounded.
**Outer segments** – colour varies from pure white to dark purple, though mostly dark blue stripes on a white or whitish ground; at the outside base almost always (including the white forms) a distinct, sharply edged dark blotch, rimmed by a somewhat starry and often narrow whitish edge, in some cases formed by stripes radiating from the tube on to the basal parts of the segments.

**Inner segments** – equal in size and colour to the outer ones, only the outside with less prominent striping.

The originally given name to this species was *Crocus aerius*, which means 'aerial' and refers to its high mountainous habitat. Later G. Maw described it one more time as *C. bilottii* and under that name it is sometimes offered in the trade, but Herbert’s name takes the priority.

In the wild it is very variable, with colours ranging from white to very deep purple and in its best forms it is one of the most beautiful crocuses, although the true species is still quite rare in cultivation and under its name fairly often are offered other *crocus* species (e.g., *Crocus pulchricolor*) or hybrids, but they are easily distinguishable by the corm tunics and the distinct colour pattern of the true species. My favourite samples are all bright blue with a lighter or darker yellow, sometimes even orange shaded throat, surrounded by a wide white zone up to half the length of the flower segments that at times looks as if white rays are shining from deep within the throat.

*Crocus aerius* is a good increaser and well sets seed although I cannot list it among the easiest species in cultivation. It grows in quite specific conditions in the wild and needs plenty of water in spring while later must be kept moderately dry and warm, as it comes from higher altitudes. Its neighbours in the wild are the autumn-blooming *C. vallicola* and *C. scharojanii*. I had not been successful with it in the garden where all my attempts had ended in a fiasco within a few years. In pots it is a good grower and blooms abundantly albeit rather late in spring. In summer it is better to take the pots with *C. aerius* outside and provide covering against excessive moisture during rainy periods. I have never observed among its seedlings any interbreeding with other species.

**Capsule** – ellipsoid, up to 17 mm long and 7 mm wide, with a peak at the top, straw coloured, positioned at ground level at maturity.

**Seeds** – reddish, subglobose, 2 mm long (with the caruncle 3.5 mm) and 1.5 mm wide with a well-developed caruncle of the same colour and an indistinct raphe.

**2n = 22.**

**Etymology** – its name refers to the mountainous habitat of this crocus, meaning aerial or high.
130. **Crocus mazziaricus** Herbert

Edwards's Bot. Reg. 31(Misc.): 3. 1845. Type: Greece, Lefkada (Lefkas), A.D. Mazziari (K).


- **Synonyms** – *C. spruneri* Boiss. & Heldr.; *C. schimperi* J.Gay ex Baker.
- **Habitat and distribution** – grows from sea level up to 1500 m altitude, in open woods or scrub, on rocky hillsides based on limestone formations, often in terra rossa. According to B. Mathew (1982), distributed in the southern part of the former Yugoslavia, in mainland Greece, the Peloponnese, the Ionian Islands, Euboea, Naxos, and in the south-western Turkish provinces of Denizli, Mugla and Aydin, but most likely in this area occur several still unrecognised species.

The area where the crocus regarded as *C. mazziaricus* s.l. is distributed according to the Atlas of the Aegean Flora and Flora of Turkey.

130a. **Lefkada (locus classicus) and the Peloponnese.**

- **Cataphylls** – 3-4, white.
- **Leaves** – 4-5, greyish green, glabrous, up to 3 mm wide, with 3 ridges in widely open lateral channels, the white stripe around 1/3 of the leaf width; usually emerge only after anthesis and remain very short until spring, or show up only in spring.
- **Bract and bracteole** – unequal, the tip of the bracteole exserted and visible without dissection.
- **Perianth tube** – white to greenish, striped purple to brownish throughout or only below the perianth.
- **Throat** – nude, from greenish white to light yellow, but always in a "cooler" shade, never orange.
- **Filaments** – 3-6(-7) mm long, glabrous, whitish to pale yellow.
- **Anthers** – up to 22 mm long, bright yellow.
- **Connective** – of the same colour as the anthers.
- **Style** – lemon yellow to lighter or darker orange, divided into many branches around the tips of the anthers and usually overtops them. The degree of branching and the length of the branches vary widely even within one population.
- **Flowers** – fragrant, vary variable in colour – those from the *locus classicus* and the Peloponnese mostly white or pale lilac (in mainland Greece, on the islands and in Turkey mostly lighter or darker lilac, although in mainland Greece among lilac individuals appear whitish coloured ones as well).
- **Flower segments** – (25-)30-50 mm long and 10-17 mm wide, obovate or oblanceolate, obtuse to acute.
• **Outer segments** – outside plain-coloured or with darker stripes of varying widths, inside slightly striped, stripes or veins more prominent in the lower part and they sometimes spread out onto the throat.
• **Inner segments** – outside base with a yellowish blotch that shines through from the throat, lined with short greyish stripes continuing from the tube.
• **Capsule** – ellipsoid, up to 25 mm long and up to 8 mm wide, usually purplish tinged, carried a little above ground level to 2(-4) cm high at maturity.

Although *Crocus mazziaricus* is a well-known and widely distributed species, its taxonomic status, or rather, to which populations its specific epithet can be applied, is still debatable. At present it is regarded as occupying a vast territory and as an extremely variable species. After having collected a quite representative material throughout its range, which begins in the *locus classicus* on Lefkada (there it grew side by side with *C. hadriaticus* in mixed populations), moves through the Peloponnese into mainland Greece where it goes northwards through Thíva and Larissa as far as the Athos peninsula, then shifts southwards to Samos and Ikaria and turns eastwards into W Turkey, I noticed a very interesting tendency – the dominating colour in the observed populations gradually transformed from almost invariably white to quite deep lilac, with almost no whites in Turkey (although some whitish ones there were seen). Similarly changed the corm tunics: in Lefkada and the Peloponnese they were distinctly finer fibrous than those to the east, and the length of the tunic neck varied greatly, from very short up to 5 cm long.

Certainly, in such a large region several species might be hiding under the common name “*C. mazziaricus*” because until now, when a sample of an autumn-blooming crocus with reticulated tunics was collected in the designated area, it, in accordance with Mathew and Flora of Turkey, was automatically labelled as *C. mazziaricus*. The description here is based on my own observations on the plants collected during several trips.

• **Seeds** – ellipsoid, up to 4 mm long, dark brown to reddish brown, with the raphe of the same colour and a prominent, paler caruncle.
• **2n** = 16 (according to Brighton, 1977 – as *C. cancellatus* – in the area where *C. mazziaricus* s.l. is distributed).
• **Etymology** – named after Alessandro Domenico Mazziari (*-1857), who collected the species on Lefkada.
This population was accidentally spotted in 2011 when I with my wife Guna were rushing to the airport, so there was time only for a brief look and the recording of the geographical coordinates. It grew in sparse grass in clearings between dwarf spiny shrubs and had just started to bloom. I returned to the locality together with my Czech friends in autumn 2014 when the crocus in the first spot had almost finished flowering, but we found another beautiful location near Ancient Thera, where it was abundantly blooming between dense shrubs and in small clearings. There light lilac individuals dominated, although whitish ones were not rare, we even saw one in a distinctly pinkish shade. The leaves of this second population in their lateral channels had (3-4-5 ribs, the corms for the most part were with longer necks, though this feature varied greatly, the tunics were more coarsely fibrous than those on the Peloponnese.
130c. Greece, near Larissa (Thessaly).

This population I have not seen. Its pictures were sent to me by George Papapolymerou – a great Greek crocus enthusiast. The population (judging by the pictures) is very uniform, lilac, and looks very distinct, certainly worthy of an in-depth research. According to George, the leaves in 10-15% of the observed plants had emerged already during anthesis.

130d. Greece, the Athos peninsula (Chalkidiki).

Crocuses from the mazziaricus group were seen growing there only in deep limestone rock splits alongside footpaths to the top of Mt. Athos at the southern end of the peninsula. Only very few corms had to be dug to realize that it was not the searched C. athous so no special attention was paid to this species anymore. At home all of them bloomed with bright lilac-blue flowers. Corm tunics were very coarsely fibrous-reticulated, with a comparatively short fibrous and bristly neck. On the attached picture the remnants of the old tunic give the impression of a very elongated corm, but in reality it is subglobose with a flattened bottom and is around 10-12 mm in diameter. It has very wide leaves (the widest among all of the observed ‘mazziaricus‘) that are almost nude to very sparsely papillosse or hairy, with (2-)3-4 ribs in their lateral channels.

130e. Greece, Samos.

On Samos, too, only very few corms were collected. All the plants had invariably blue blooms and their throats were of the deepest yellow seen in the specimens of this group observed in Greece. Corm tunics were very coarsely reticulated. Cataphylls are straw yellow, whilst in other samples white or whitish. Seedpods are carried 5-7 cm above ground at maturity, seeds are distinctly elongated – 5 mm long and 2 mm wide, dark purplish red.
I grow many gatherings of the so-called *Crocus mazziaricus* from Turkey, but most of them have been collected in spring, with no flowers, so it is impossible to judge on the variability of this crocus there. But at least they can be regarded as very indiscriminate – no preferences to a particular flower type are of any significance when collecting corms in leaves. And all the Turkish plants invariably are more or less blue. Even the most light-hued forms would have something bluish on the flower segments.

New species from *C. mazziaricus* group near vil. Çamköy in Denizli Province - flowers.
**Crocus thirkeanus** K.Koch


- **Synonyms** – *C. gargaricus* subsp. *herbertii* B.Mathew; *C. herbertii* (B.Mathew) B.Mathew.
- **Habitat and distribution** – moist open meadows, at forest edges and in sparse pine woods, observed by me at altitudes of 900-1600 m, may be situated at higher altitudes, too; together with *Scilla bifolia*, *Crocus pulchricolor*, *C. chrysanthus*, etc., on Uludağ, Bursa Province and Boz Dağ, Manisa Province, Turkey. It is possible that the population from Kaz Dağı in Balikesir Province belongs to *C. thirkeanus* as well.
- **Flowering time** – March-May.
- **Corm** – globose to subglobose, 5-7(-12 – in cultivation) mm in diameter, forming small rice-grain like (1-2(-4) mm wide and up to 4-5(-8) mm long) cormlets at the ends of 5-10 cm long side-growing stolons.
- **Tunics** – distinctly finely parallelly fibrous (in the very similar *C. gargaricus* – distinctly reticulated).
- **Tunic neck** – very short, only 2(-3) mm long, formed by elongated fibres of the main tunic.
- **Basal rings** – absent.
- **Prophyll** – absent.
- **Cataphylls** – 3, white, with brownish or greenish upper edges, hidden under ground or only slightly exserted (in cultivation).
- **Leaves** – 2-3(-4?), glabrous, green, in plants from Göktepe up to 2 mm wide, on Uludağ can reach even 4 mm (in cultivation), lateral channels widely open with down-turned edges of the lamina and without ribs, the white stripe around 1/4 to 1/3 of the leaf width; in the wild positioned mostly below flowers, rarely reaching their bases and only occasionally the tips of the segments, in cultivation just emerging or reaching the base of the flowers at anthesis.

Yellow dots mark the localities where *Crocus thirkeanus* has been observed on Uludağ and on Boz Dağ, the red dot marks an unchecked population on Kaz Dağı.

*C. thirkeanus* corms with stoloniferous cormlets.

*C. thirkeanus* and *C. pulchricolor* blooming side by side on Uludağ.
Crocus thirkeanus is much better known under the name of C. herbertii. It was used by gardeners to refer to the stoloniferous form of the crocus previously regarded as part of the C. gargaricus complex. Well separable from the latter by its corm tunics and the stoloniferous habit it is practically indistinguishable by flowers from C. gargaricus. Only if planted side by side, the flowers of C. thirkeanus seem to be slightly smaller, but the difference is so subtle that it becomes unidentifiable if seen alone. There is a small variation in the intensity of the flower colour. Plants from Uludağ seem to be generally slightly darker and more orange-shaded than those from Boz Dağ. W. Herbert used the name var. citrinus for the lemon-yellow forms but it is unclear to which of the two lookalike species this epithet was applied. Until recently albinos were unknown in any of them, and C. thirkeanus was known only from Uludağ. In spring 2013 our small group travelled across the provinces of Izmir and Manisa looking for the recently described crocus species from this region. On the damp slopes of Boz Dağ, close to the border of Izmir Province, we stopped to take a picture of beautiful groups of C. chrysanthus and great was our surprise when nearby we saw blooming another, albeit very similar crocus. Only the checking of its corm tunics confirmed that we had found a new location of C. thirkeanus around 200 km to the south from the type locality. When somewhat higher up the slope I noticed some crocuses with white flowers, my first impression was that it was one of the new “biflorus” species, but it turned out that it was the first pure albino in this uniformly yellow, as it was supposed before, species. The stoloniferous habit had allowed this mutation to spread and it was possible to collect a couple of corms without causing much

**Crocus thirkeanus** (Uludağ) blooming in the author’s collection. A paler yellow-coloured specimen from Uludağ

*Crocus thirkeanus* is much better known under the name of *C. herbertii*. It was used by gardeners to refer to the stoloniferous form of the crocus previously regarded as part of the *C. gargaricus* complex. Well separable from the latter by its corm tunics and the stoloniferous habit it is practically indistinguishable by flowers from *C. gargaricus*. Only if planted side by side, the flowers of *C. thirkeanus* seem to be slightly smaller, but the difference is so subtle that it becomes unidentifiable if seen alone. There is a small variation in the intensity of the flower colour. Plants from Uludağ seem to be generally slightly darker and more orange-shaded than those from Boz Dağ. W. Herbert used the name var. *citrinus* for the lemon-yellow forms but it is unclear to which of the two lookalike species this epithet was applied. Until recently albinos were unknown in any of them, and *C. thirkeanus* was known only from Uludağ. In spring 2013 our small group travelled across the provinces of Izmir and Manisa looking for the recently described crocus species from this region. On the damp slopes of Boz Dağ, close to the border of Izmir Province, we stopped to take a picture of beautiful groups of *C. chrysanthus* and great was our surprise when nearby we saw blooming another, albeit very similar crocus. Only the checking of its corm tunics confirmed that we had found a new location of *C. thirkeanus* around 200 km to the south from the type locality. When somewhat higher up the slope I noticed some crocuses with white flowers, my first impression was that it was one of the new “biflorus” species, but it turned out that it was the first pure albino in this uniformly yellow, as it was supposed before, species. The stoloniferous habit had allowed this mutation to spread and it was possible to collect a couple of corms without causing much
damage to the habitat, and I hope that in due course this form will find its way into our gardens. The flowers are white throughout and only the anthers have retained the yellow colour.

Plants from Kaz Dağı in Balıkesir Province geographically are situated midway from the populations in Uludağ and in Boz Dağ, so most likely they belong to Crocus thirkeanus, too, although B. Mathew in his monograph and in Flora of Turkey regards them as C. gargaricus. Field research is needed to confirm this approach.

The taxonomical position of Crocus thirkeanus is still somewhat unclear. According to G. Petersen & al. (2008), it is placed next to two beautiful blue-coloured species from the former series Biflori – C. leichtlinii and C. kerndorffiorum, but C. gargaricus is put in another well-supported clade together with C. cancellatus, species of series Speciosi and others, confirming its distance from C. herbertii. D. Harpke (2012) still positions them side by side, but close to C. leichtlinii and C. kerndorffiorum, and confirms that the two species have identical chromosome numbers.

Crocus thirkeanus is very easy in the garden but not too convenient for a nurseryman, just because of its stoloniferous habit and the production of very small cormlets, which are nearly impossible to collect at harvesting time. What is a problem for nurserymen is a great gain for home gardeners. Once planted on a rockery or anywhere else, it can stay there for years and the spot will slowly grow in size. When after a very hard winter I lost my stock that was planted on open beds, I revisited the long abandoned garden of my youth where I had planted my first corms of C. thirkeanus under an old apple-tree more than 30 years ago and it still was thriving there. Not that easy is it in pots either as it needs more frequent watering than most of other crocuses and I would recommend moving them out of the greenhouse in summer, but it had not suffered even when left inside during the hottest months. It regularly sets seed though not very abundantly, but excellently multiplies by cormlets well compensating the aforementioned “fault”.

\[ C. thirkeanus \text{ on Boz Dağ.} \]

\[ Albino form of \ C. thirkeanus \text{ on Boz Dağ.} \]

\[ Corms of \ C. thirkeanus \text{ (Boz Dağ) showing side-growing stolons.} \]

\[ Crocus thirkeanus \text{ habitat on Boz Dağ.} \]