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Issue IRG 136 is devoted to Colchicaceae - with a richly illustrated article by Dr Dimitri Zubov on cultivated Colchicum Species.

Dr Zubov is no stranger to readers of the International Rock Gardener, having featured as an author previously, for instance in the publication of his papers for *Crocus ruksansii* Zubov in [IRG 90](#), *Iris sisianica* Zubov and Bondarenko, with Leonid Bondarenko in [IRG 99](#), *Fessia olangensis* Zubov and Rukšāns, with Dr Janis Rukšāns in [IRG 113](#) and his review of Genus *Galanthus* L. in the Caucasus in [IRG 123](#) and also for his mentions in the articles of other plant hunters.

Dr Dimitri Zubov is a biologist and biotechnologist, who is involved in the Ukrainian industry of human cell-based medicinal products manufacturing. He is also lead researcher in the State Institute for Genetic and Regenerative Medicine, of the National Academy of Medical Sciences of Ukraine, but his first love is botany and bulb growing. He lives in the Kyiv (Kiev) area of Ukraine, where he maintains in the ground a living collection of geophytes from different geographic sites, including genera such as *Galanthus*, *Colchicum*, *Fritillaria*, *Scilla*, *Erythronium*, *Paeonia* etc. Dimitri is also a member of a phylogenetic team (lead by dr Aaron Davis, based in RBG Kew, Richmond, UK) which studies the evolutionary history of snowdrops and their infrageneric kinship. In 2018 they described a new snowdrop species, *Galanthus panjutinii* Zubov & Davis (Platyphyllus clade) from Southern Russia; and in 2019 an Autumn-flowering species, *Galanthus bursanus* Zubov, Konca & Davis (Nivalis clade) from Western Turkey.

All photos in the article are copyright Dr. D. Zubov.

Cover image: *Colchicum freynii* corms (Ardabil - Iran) - photo Dimitri Zubov



Dimitri Zubov near Bishkek city, Kyrgyzstan; May 2015 – photo Olga Bondareva

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--- Colchicum Species ---

Cultivated *Colchicum* species (Colchicaceae) introduced in Central Ukraine

Dr. Dimitri Zubov, Kyiv region, Ukraine

The genus *Colchicum* L. is one of the evolutionary ancient plant groups in the *Colchicaceae* DC. family of Monocots, the primitive morphological features can be found in African members of the closely related genus *Androcymbium* Willd. for now, taxonomically absorbed into the genus *Colchicum*. The name of the genus derives from the Ancient Greek name – Κολχίς, for the Caucasian region of Kolkhida in today's Georgia. Indeed, this is a well known Colchis refugium of the ancient flora (a present-day Colchis Lowland).

In combined phylogenetic analyses of plastid sequences and morphological characters made by Karin Persson (Göteborg Botanical Garden, Sweden) et al., 2011, *Colchicum* is placed as sister to the genus *Androcymbium* as a whole. In the same study the genus *Colchicum* members turned to be sister to *Androcymbium gramineum* (Cav.) J.F. Macbr. of a North African / Mediterranean group of species. It should be also noted that Göteborg Botanical Garden possess one of the largest living collection of *Colchicum* species, mainly cultivated in green houses.

All colchicums are highly toxic plants which should be kept in mind when handling with them, namely with corms and fresh green capsules with seeds. The ingestion of whole plants or their parts may cause severe multiorgan failure and death. At the same time its toxic compound *colchicine* is widely used as a drug in medicine for treatment of skin cancer, familial Mediterranean fever and urarthritis (gout attacks).

The colchicums themselves (including the former genera *Merendera* Ramond and *Bulbocodium* L.) already have a typical flower with six (in two whorls) separate or fused into a tube perianth segments. The representatives (in total, a bit more than 100 species, excluding *Androcymbium*, according to K. Persson, 2007) of the genus are naturally distributed from Spain, Portugal and the countries of North Africa (northern areas of Morocco, Algeria, Tunisia, Libya and Egypt) in the west of the whole genus range, to India and Pakistan in the east, in the north - from Germany and Poland, to Saudi Arabia to the south. Depending on the ecological niches and climate conditions, various species and their geographic races reflect a rich palette of variability of morphological, anatomical and phenological characters within the genus. Colchicums are mesic geophytes with corms. Plants are from 3-5 cm to 20-25 cm in height when flowering, with leaves in fruiting from 10 cm to 60 cm in height; six perianth segments separate or fused in a tube; with synanthous, - leaves accompany the flowers, (species of the late autumn-, winter- and spring-flowering groups), or hysteranthous, - leaves appear much later after flowering (species from the late

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summer- to late autumn-flowering groups), flowering patterns; perianth colour varies from white to pink, lilac, dark purple and yellow; corm tunics papery, membranous to subcoriaceous and hardy coriaceous; leaf number 2 to 25 a corm, they are linear to widely lanceolate, bright green or glaucous, glabrous to pubescent or with cilia along the margin of a leaf blade.

An interesting feature of most species is the scout-flower. This is the very first one that appears above the soil surface and it as if it assesses the current weather situation. If it is frosty or very hot, then it gives 'a signal' to slow down a flowering of all other flowers in the corm. The flowers are bright and fragrant and pollinated by bees, bumble bees, different flies and ants.



Fig.1: *Colchicum laetum* seeds; May 2020.

The seed capsule is septical, trilocular, from syncarpous multi-leaf fruit (with separate carpels, for example, as in the genus *Androcymbium*) to syncarpous capsule (carpels fused to varying degrees); as the ovary of a flower is always underground, the fruits mature under soil barely showing the apices of the carpels or they sometimes sit on the stalk a few centimetres above ground level. In the wild a capsule ripening depends on the species and flowering pattern, usually being from very late winter to late spring - early summer period.

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Fig.2: *Colchicum robustum* seeds; May 2020.



Fig.3: *Colchicum woronowii* seeds; May 2020.

The seeds are \pm round or rounded irregularly-faceted, with a hilum, small in size 0.2 cm (e.g., *C. soboliferum*) to relatively large - 0.6 cm (e.g., *C. luteum*, *C. woronowii*, *C. robustum*) in diameter, light coloured when the capsule is ripening, then they dry out and darken, transiting into the long and deep period of dormancy (Figs. 1-3). So they should be sown immediately after harvesting. It is advisable to keep the substrate moist until their germination. In this case the seedlings appear next spring, otherwise they can germinate much later, even several years after overdried sowing. I keep the freshly harvested seeds after capsule ripening in barely wet perlite/vermiculite mix (1:1) in plastic ziplock bags at room temperature with no direct sun until sowing in the ground in October (Fig. 4). When self-sowing, the seeds remain under the parent plant and will germinate in a cluster next spring. Apparently, there is no one agent known to distribute them, since they do not generally contain fleshy appendages, like snowdrops seeds with elaiosomes. Colchicums start to bloom from seed sowing, in 5-7 years, depending on the species.

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Fig.4: *Colchicum laetum* seeds in ziplock bags prefilled with perlite/vermiculite mix; May 2020.

The corm is annual, forming a new replacement corm every year. The variability in the corm shape is impressive: round to ovoid, cigar-shaped, without a vertical outgrowth, 'a foot' (e.g., *Colchicum hungaricum*, *C. bulbocodium* subsp. *bulbocodium*, *C. manissajanii*, *C. kurdicum*) or with 'a foot', at the distal end of which a new bud sits (in most species, e.g., *C. macrophyllum*, *C. szovitsii*, *C. decaisnei*, *C. freynii*, *C. jolantae*), and there are also varying degree stoloniferous corms lying horizontally in a soil (e.g., *C. soboliferum*, *C. boissieri*, *C. davisii*, *C. minutum*, *C. munzurensis*). The corms are covered by sheaths (tunics) of old leaves with straw, brown, reddish to nearly black colour, continuing into a more or less long neck (sometimes neck is much longer than a corm, e.g., *C. laetum*, *C. greuteri*, *C. kesselringii*, *C. freynii*, and it is a distinctive feature when identifying colchicum species). The corm tunics can be very hard coriaceous (leathery) to subcoriaceous, as, for example, in species from arid regions with dry, hard compacted soils (e.g., *C. trigynum*, *C. candidissimum*, *C. varians*, *C. freynii*); or may have thin papery tunics, as, for example, in alpine belt species from meadows and in species from seasonally waterlogged biotopes (e.g., *C. raddeanum*, *C. triphyllum*, *C. leptanthum*, *C. soboliferum*, *C. hirsutum*); and with submembranous to membranous tunics in all other species (e.g., *C. autumnale*, *C. woronowii*, *C. laetum*, *C. macrophyllum*, *C. szovitsii*, *C. serpentinum*, *C. doerfleri*).

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Many species form vegetative clones through daughter corms from the main and lateral buds (e.g., *C. autumnale*, *C. szovitsii*, *C. speciosum*, *C. bulbocodium* subsp. *bulbocodium*, *C. hungaricum*, *C. munzurense*), while some make few to multiple tiny, stolon-borne cormels (e.g., *C. varians*, *C. manissajjanii*, *C. atticum*, *C. freynii*). But as a rule, most species generate only one replacement corm annually.

Essentially, the most problematic in cultivation are the *Colchicum* species growing in extreme sites of the ecological optimum, such as alpine meadows with long-lasting snow cover (it is necessary to ensure constantly cool storage of corms during the summer dormancy), or such as dry and hot desert conditions for most of the year (here, in Ukraine, on the contrary, it is necessary to provide dry and hot storage of corms in summer with minimal, but sufficient, amount of precipitation during the growing and flowering season). Also, it should be noted that species from Mediterranean area with winter foliage aren't at all frost-tolerant, requiring protected sites in regions with colder climates. Otherwise, the colchicums are unpretentious and highly decorative corm geophytes that will delight you with their prolonged flowering period from end July - early August to April, if you provide an appropriate range selection of species for your garden.

The known speciation and biodiversity centres of colchicums in the world are Asia Minor (Turkey), the Caucasus and Transcaucasia, the Mediterranean and Central, South and Eastern Europe. Several species grow in the North Africa, Iberian Peninsula, the Middle East, Western and Central Asia and in Western Himalayas (India, Pakistan).

K. Persson (2007) suggested that evolution in *Colchicaceae* in part is reticulate because of the high percentage of most probably allopolyploid species, ~75% of the species in *Colchicum* are polyploid.

N.B. Attention must also be paid to the separate *Colchicum* allopatric clade from Central Asia and Western Himalaya, which includes closely related ancient species *C. luteum*, *C. kesselringii*, their natural hybrid *C. alberti*, *C. robustum* and *C. jolantae*. During the Soviet Union era white, large flowered forms of *C. kesselringii* aff. were found in Tajikistan and named by Lithuanian nurseryman Leonid Bondarenko as 'Snow of Highland' and 'Yeti'. But I state here my personal opinion after many years' observation in my garden: they can be treated as white flowered forms of ***C. luteum* forma *alba* Zubov** by their habit and morphological characters. Leonid also performs the breeding work involving different clones of *C. luteum*, as well as 'Snow of Highland' and 'Yeti', and he already achieved a set of magnificent infraspecific *C. luteum* hybrids available for trade, such as e.g., 'Vahsh', 'Carrot Line', 'Golden Elf', 'Minion', 'Golden Baby', 'Lucky Selfmade', 'Selena'; and infraspecific *C. kesselringii* hybrids, e.g. 'Purple Star', 'My Choice'.

Taxonomy

I also give here two new taxonomical combinations based on my field notes and garden studies:

Colchicum candidissimum (Miscz. ex Grossh.) Zubov, **comb. nov.** = *Merendera candidissima* Miscz. ex Grossh., Fl. Kavk. 1: 190 (1928). – Type: Azerbaijan: ‘Prov. Baku, distr. Lenkoran, prope pag. Orant, culta in sect. cauc., leg. Grossheim, det. Misczenko’, lectotype TBI (designated in: Persson K. (2007) Nomenclatural synopsis of the genus *Colchicum* (Colchicaceae), with some new species and combinations. - Bot. Jahrb. Syst. 127: 165-242).

Although Karin Persson states that *Merendera candidissima* is considered by her conspecific with *C. trigynum* (*M. trigyna*) I’ve decided based on my studies, to separate this taxon with its given distribution only in Transcaucasia and Talysh (S Armenia, Azerbaijan, W Iran). The polymorphic *C. trigynum* is, in contrast, distributed within Ciscaucasia and Caucasus (Russia, Georgia, N Armenia) and, possibly, in NE Iran, Golestan Province.

Colchicum jolantae (Czerniak.) Zubov, **comb. nov.** = *Merendera jolantae* Czerniak., in Izv. Glavn. Bot. Sada SSSR 29: 133 (1930), Repert. Spec. Nov. Regni Veg. 27: 264 (1930). – Type: Iran/Turkmenistan: ‘Turcomania borealis, Kopet-dagh, Razarash [Rizarash, Kuh-e Reza], ad nives deliquescentes’, 9.VI.1924, Czerniakovska 160, holotype LE.

In NE Iran *C. robustum* and *C. jolantae* (*M. jolantae*) are syntopic, at least near Raz village (North Khorasan) close to Turkmenistan border. In the wild it is too hard to distinguish them both but when cultivated side by side the morphological differences are obvious for them (Figs. 167-170, 188 -194). Nonetheless, K. Persson considers both taxa conspecific with the priority name - *C. robustum*.

My living collection has nearly 190 colchicum accessions, including geographical races and infra- and interspecific hybrids grown since 2000-2004 (mainly spring-flowering ones). Some of them are shown in the figures (Figs. 5 -194), both flowers and dormant corms. Plants are cultivated in open ground (Kiev region, Ukraine; USA hardiness zone ~5b) with minimal agrotechnical measures, but annual lifting and replanting. It is most convenient to present my colchicum living collection by geographic principle:

Crimea, Ciscaucasia, Caucasus & Transcaucasia (Ukraine, Russia, Armenia, Georgia, Azerbaijan, NW Iran):

Colchicum eichleri (Regel) K. Perss. (Figs. 5-7)

Colchicum candidissimum (Miscz. ex Grossh.) Zubov, comb. nov. (Figs. 8-10)

Colchicum freynii Bornm. (incl. *C. zangezorum* Grossh.) (Figs. 11-14)

Colchicum greuteri (Gabrieljan) K. Perss. (Figs. 15, 16)

Colchicum laetum Steven (Figs. 17, 18)

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Colchicum mirzoevae (Gabrieljan) K. Perss. (Figs. 19-21)

Colchicum raddeanum (Regel) K. Perss. (Figs. 22-25)

Colchicum speciosum Steven (Figs. 26-31)

Colchicum szovitsii Fisch. & C.A. Mey. subsp. *szovitsii* (incl. *C. bifolium* Freyn & Sint., *C. ninae* Sosn.) (Figs. 32-42)

Colchicum trigynum (Steven ex Adams) Stearn (Figs. 43-47)

Colchicum umbrosum Steven (Figs. 48, 49)

Colchicum woronowii M.R. Bokeriya (Figs. 50, 51)

Europe & Mediterranean (Spain, France, Greece, North Macedonia, Croatia, Ukraine, Moldova):

Colchicum alpinum DC.

Colchicum arenarium Waldst. & Kit. (incl. *C. fominii* Bordz.) (Figs. 52-54)

Colchicum asteranthum Vassiliades & K. Perss. (Figs. 55-57)

Colchicum autumnale L.

Colchicum bivonae Guss.

Colchicum boissieri Orph. (Figs. 58-60)

Colchicum bulbocodium Ker Gawl. subsp. *bulbocodium* (Figs. 61, 62)

Colchicum bulbocodium subsp. *versicolor* (Ker Gawl.) K. Perss. var. *versicolor* (Figs. 63-66)

Colchicum chimonanthum K. Perss. (Figs. 67, 68)

Colchicum corsicum Baker

Colchicum doerfleri Halácsy (Figs. 69-71)

Colchicum hungaricum Janka (Figs. 72-74)

Colchicum macrophyllum B.L. Burt (Figs. 75, 76)

Colchicum montanum L. (Figs. 77-79)

Colchicum pusillum Sieber (Figs. 80, 81)

Colchicum sfikasianum Kit Tan & Iatrou (Figs. 82, 83)

Colchicum triphyllum Kunze (Figs. 84-88)

Colchicum turcicum Janka (Figs. 89, 90)

Colchicum variegatum L. (Figs. 91-93)

Minor & Western Asia, Near East (Turkey, Iran):

Colchicum antepense K. Perss. (Figs. 94-96)

Colchicum atticum Spruner (Figs. 97-99)

Colchicum balansae Planch. (Figs. 100, 101)

Colchicum burtii Meikle (Figs. 102-105)

Colchicum crocifolium Boiss. (Figs. 106-109)

Colchicum davisii C.D. Brickell (Fig. 110)

Colchicum decaisnei Boiss.

Colchicum figlalii (Varol) K. Perss. (Figs. 111-113)

Colchicum freynii Bornm. (Figs. 11-14)

Colchicum hirsutum Stef. (Figs. 114-116)

Colchicum kotschyi Boiss. (Figs. 117, 118)

Colchicum kurdicum (Bornm.) Stef. (Figs. 119-122)

Colchicum lagotum K. Perss. (Figs. 123-125)

Colchicum leptanthum K. Perss. (Figs. 126-128)

Colchicum manissadjianii (Azn.) K. Perss. (Figs. 129, 130)

Colchicum micaceum K. Perss. (Figs. 131, 132)

Colchicum minutum K. Perss. (Figs. 133, 134)

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Colchicum munzurense K. Perss. (Figs. 135-137)

Colchicum persicum Baker (Figs. 138, 139)

Colchicum poliphyllum Boiss. & Heldr.

Colchicum raddeanum (Regel) K. Perss. (Figs. 22-25)

Colchicum sanguicolle K. Perss. (Figs. 140-142)

Colchicum serpentinum Woronow ex Miscz. (Figs. 143-147)

Colchicum sieheanum Hausskn. ex Stef. (Figs. 148, 149)

Colchicum soboliferum (Fisch. & C.A. Mey.) Stef. (Figs. 150, 151)

Colchicum szovitsii subsp. *brachyphyllum* (Boiss. & Hausskn.) K. Perss. (Figs. 152-154)

Colchicum trigynum (Steven ex Adams) Stearn (Figs. 43-47)

Colchicum triphyllum Kunze (Figs. 84-88)

Colchicum varians (Freyn & Bornm.) Dyer (Figs. 155-158)

Colchicum wendelboi K. Perss. (Figs. 159-161)

Central Asia & Western Himalaya (NE Iran, Turkmenistan, Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan):

Colchicum alberti Regel (cf. *C. luteum* × *C. kesselringii*) (Figs. 162-166)

Colchicum jolantae (Czerniak.) Zubov, comb. nov. (Figs. 167-170)

Colchicum kesselringii Regel (Figs. 171-174, 176)

Colchicum kesselringii f. *albiflora* (Fig. 175)

Colchicum luteum Baker (Figs. 177-182, 185, 186)

Colchicum luteum f. *alba* Zubov (Figs. 183, 184, 187)

Colchicum robustum (Bunge) Stef. (Figs. 188-194).

Ed.: Images of flowers and corms follow from next page.

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Crimea, Ciscaucasia, Caucasus & Transcaucasia (Ukraine, Russia, Armenia, Georgia, Azerbaijan, NW Iran):



Fig. 5: *Colchicum eichleri* flowering (Gobustan - Azerbaijan); February 2020

Fig. 6: *Colchicum eichleri* flowering (Ismaili - Azerbaijan); February 2020

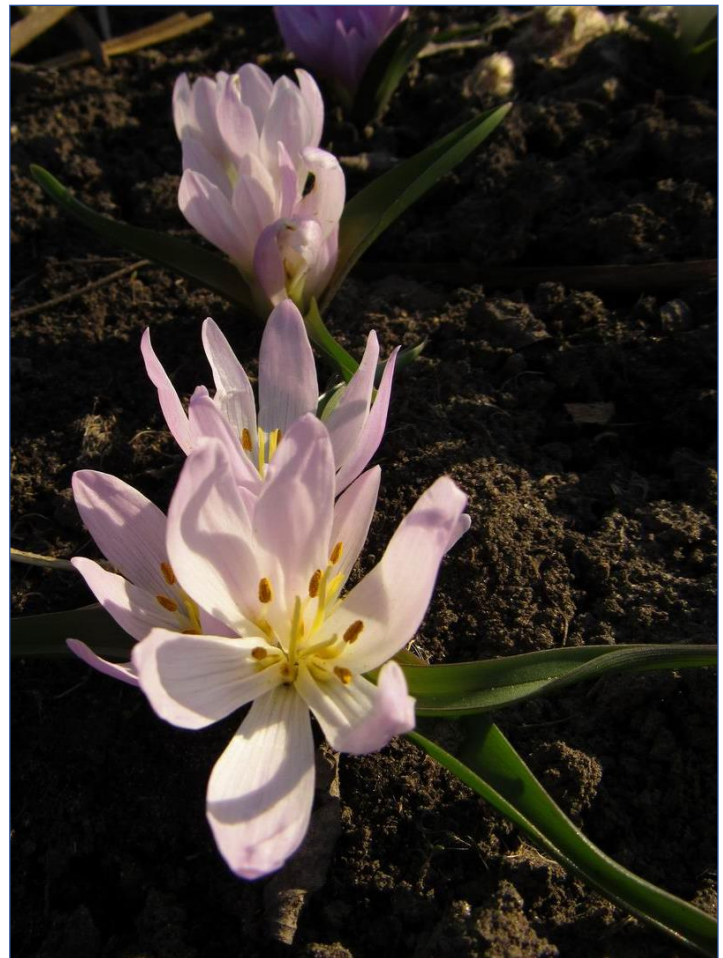


Fig. 7: *Colchicum eichleri* corms (Gobustan - Azerbaijan); September 2020

Fig. 8: *Colchicum candidissimum*
flowering (Lerik - Azerbaijan); February
2020



Fig. 9: *Colchicum candidissimum* flowering
(Lerik - Azerbaijan); February 2020

Fig.10: *Colchicum candidissimum*
corms (Lerik - Azerbaijan);
September 2020



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Above left, Fig. 11: *Colchicum freynii* flowering (Ardabil - Iran); February 2020



Above right, Fig. 12: *Colchicum freynii* (*C. zangezorum*) flowering (Urts Range - Armenia); March 2021



Fig. 13: *Colchicum freynii* flowering (Jolfa - Iran); February 2020

Fig. 14: *Colchicum freynii* corms (Ardabil - Iran); September 2020



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Fig. 15: *Colchicum greuteri* flowering
(Aragatsotn - Armenia); March 2021

Fig. 16: *Colchicum greuteri* corms
(Aragatsotn - Armenia);
September 2020



Fig. 17: *Colchicum laetum* corms
(Eastern Stavropol - Russia);
September 2020



Fig. 18: *Colchicum laetum* flowering in the wild (Eastern Stavropol - Russia); September 2018



Fig. 19. *Colchicum mirzoevae* flowering (Tavush - Armenia); March 2010



Fig. 20. *Colchicum mirzoevae* flowering (Tavush - Armenia); March 2019

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Fig. 21: *Colchicum mirzoevae* corms
(Tavush - Armenia); September 2020



Fig. 22: *Colchicum raddeanum* corms (Vayots Dzor - Armenia); September 2020

Fig. 23: *Colchicum raddeanum*
flowering (Gilan – Iran); May
2018





Fig. 24: *Colchicum raddeanum* flowering in the wild (Kuhha-ye Sabalan – Iran); May 2018



Fig. 25: *Colchicum raddeanum* flowering (Kuhha-ye Sabalan – Iran); May 2018



Fig. 26: *Colchicum speciosum* flowering in the wild (Abkhazia - Georgia); September 2018



Fig. 27: *Colchicum speciosum* flowering in the wild (Abkhazia - Georgia); September 2018



Fig. 28: *Colchicum speciosum* flowering in the wild (North Caucasus, Dombai - Russia); August 2016



Fig. 29: *Colchicum speciosum* flowering in the wild (North Caucasus, Dombai - Russia); August 2016



Fig. 30: *Colchicum speciosum* flowering (Abkhazia - Georgia); August 2020



Fig. 31: *Colchicum speciosum* flowering (Talysh - Iran); September 2020



Fig. 32: *Colchicum szovitsii* subsp. *szovitsii* flowering in the wild (Kuhha-ye Sabalan – Iran); May 2018

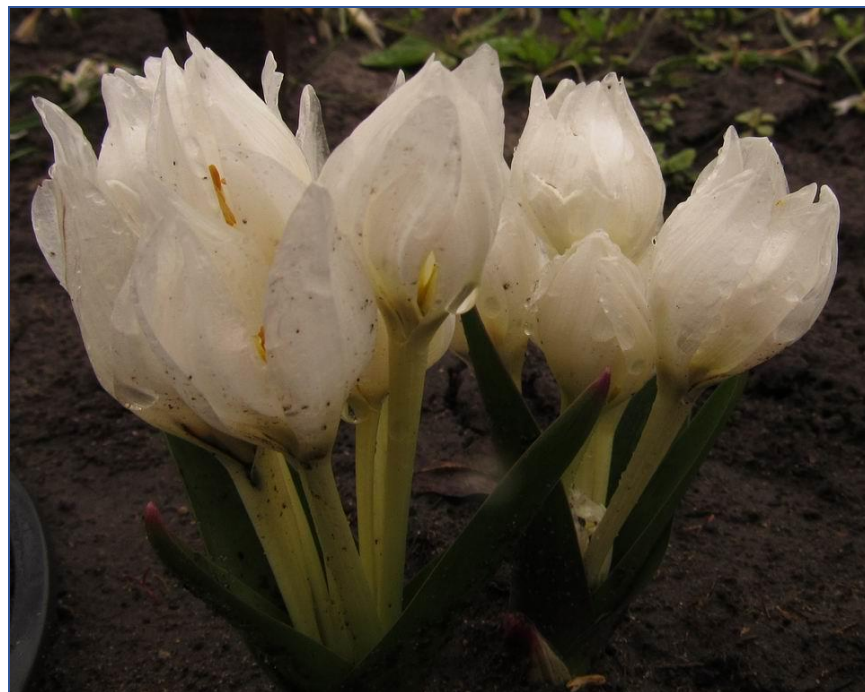


Fig. 33: *Colchicum szovitsii* subsp. *szovitsii* flowering (Vayots Dzor - Armenia); April 2021



Fig. 34: *Colchicum szovitsii* aggregate species flowering: upper row – *C. ninae*, middle row – *C. bifolium* f. *alba*, lower row – *C. szovitsii* subsp. *szovitsii* s.str. (Armenia); March 2019



Fig. 35: *Colchicum szovitsii* subsp. *szovitsii* s.str. corms (Vayots Dzor - Armenia); September 2020



Fig. 36: *Colchicum bifolium* flowering in the wild (*C. szovitsii* aggregate species; Mount Aragats - Armenia); May 2019

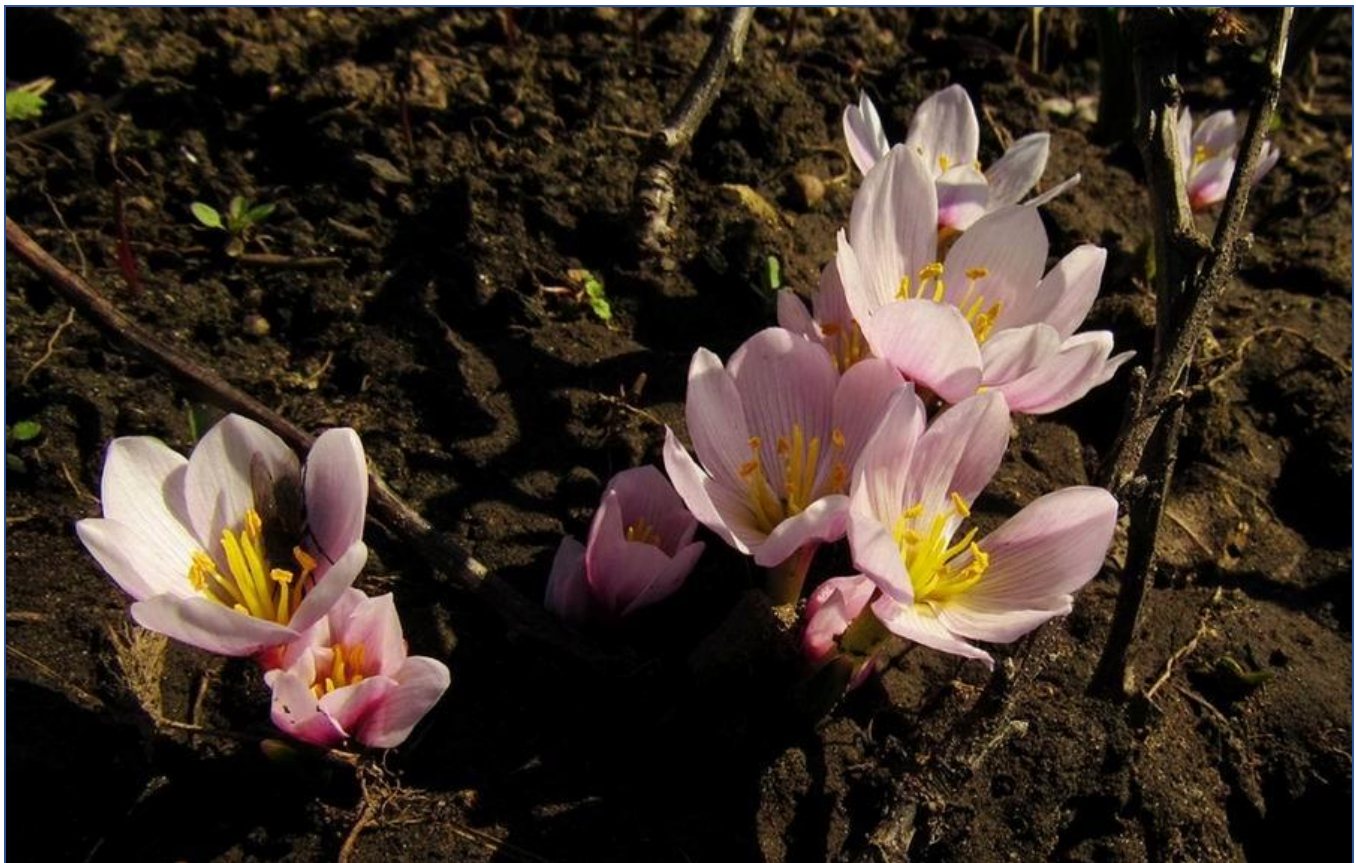


Fig. 37: *Colchicum bifolium* flowering (*C. szovitsii* aggregate species; Lori - Armenia); March 2019



Fig. 38:
Colchicum
bifolium (*C.*
szovitsii
aggregate
species; Lori
- Armenia);
March 2019

Fig. 39:
Colchicum
bifolium
corms (*C.*
szovitsii
aggregate
species; Lori -
Armenia);
September
2020





Fig. 40: *Colchicum ninae* flowering (*C. szovitsii* aggregate species; Vayots Dzor, Jermuk - Armenia); March 2019



Fig. 41: *Colchicum ninae* flowering (*C. szovitsii* aggregate species; Vayots Dzor, Jermuk - Armenia); March 2019



Fig. 42: *Colchicum ninae* corms (*C. szovitsii* aggregate species; Vayots Dzor, Jermuk - Armenia); September 2020



Fig. 43: *Colchicum trigynum* flowering (Lori - Armenia); February 2020



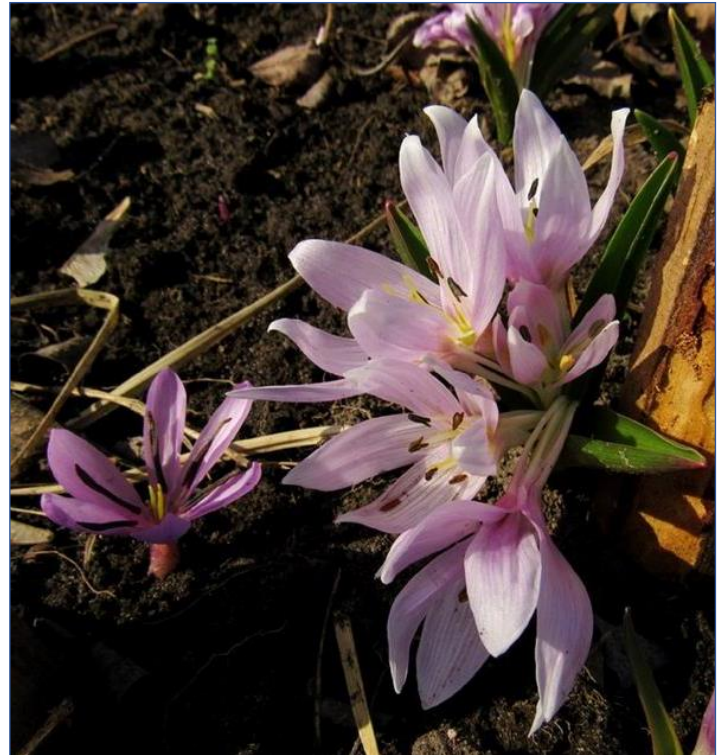
Fig. 44: *Colchicum trigynum* flowering (Lori - Armenia); March 2010

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Fig. 45: *Colchicum trigynum* (a white form) flowering (North Caucasus, Karachay-Cherkess Republic - Russia); February 2020

Fig.46: *Colchicum trigynum* flowering (North Caucasus, Karachay-Cherkess Republic - Russia); February 2020.



Below, Fig. 47: *Colchicum trigynum* corms (Lori - Armenia); September 2020





Fig. 48: *Colchicum umbrosum* flowering (Crimea - Ukraine); September 2019



Fig. 49: *Colchicum umbrosum* flowering (Crimea - Ukraine); September 2019



Fig. 50: *Colchicum woronowii* flowering in the wild (Mount Mamdzyskhka, Abkhazia - Georgia); September 2018



Fig. 51: *Colchicum woronowii* flowering (Mount Mamdzyskhka, Abkhazia - Georgia); September 2020

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Europe & Mediterranean



Figs. 52 & 53: *Colchicum arenarium* (*C. fominii*) flowering in the wild (Budzhak - Moldova);
September 2016



Fig. 54: *Colchicum arenarium* (*C. fominii*) corms (Budzhak - Moldova); August 2015

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Figs. 55 & 56: *Colchicum asteranthum* flowering (Peloponnesus, Arkadia - Greece); February 2020 and March 2021

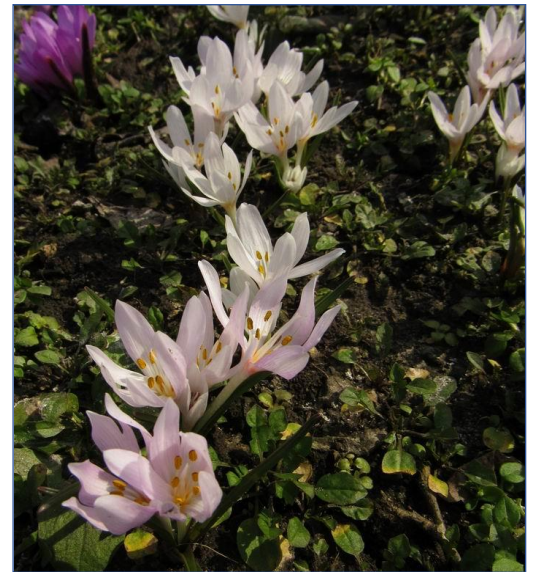


Fig. 57: *Colchicum asteranthum* corms (Peloponnesus, Arkadia - Greece); September 2020

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Fig. 58: *Colchicum boissieri* flowering
(Samos, Mount Ampelos - Greece);
October 2020



Fig. 59: *Colchicum boissieri* flowering
(Samos, Mount Ampelos - Greece); October
2020



Fig. 60: *Colchicum boissieri* vs *Sternbergia clusiana* flowering (Samos, Mount Ampelos – Greece vs
Kurdistan – Iran); October 2020

Fig. 61: *Colchicum bulbocodium* subsp. *bulbocodium* flowering (Alpes Maritimes - France); February 2020



Fig. 62: *Colchicum bulbocodium* subsp. *bulbocodium* corms (Alpes Maritimes - France); September 2020

Fig. 63: *Colchicum bulbocodium* subsp. *versicolor* var. *versicolor* flowering (Odessa - Ukraine); February 2020

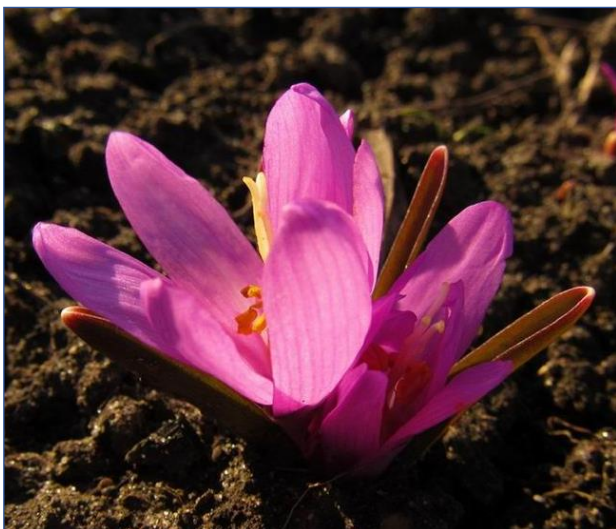


Fig. 64: *Colchicum bulbocodium* subsp. *versicolor* var. *versicolor* flowering (Transnistria - Moldova); February 2020

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Fig. 65: *Colchicum bulbocodium* subsp. *versicolor* var. *versicolor* flowering in the wild (Transnistria - Moldova); March 2015



Right, Fig. 66: *Colchicum bulbocodium* subsp. *versicolor* var. *versicolor* corms (Transnistria - Moldova); September 2020



Left, Fig. 67: *Colchicum chimonanthum* corms (Thessaloniki - Greece); September 2020



Fig. 68: *C. chimonanthum* flowering (Thessaloniki - Greece); February 2020

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Left, Fig. 69: *Colchicum doerfleri* flowering (Skopje – North Macedonia); February 2020

Right, Fig. 70: *Colchicum doerfleri* corms (Skopje – North Macedonia); September 2020



Fig. 71: *Colchicum doerfleri* flowering (Kumanovo – North Macedonia); February 2020

Fig. 72: *Colchicum hungaricum* 'Velebit Star' flowering (Velebit – Croatia); February 2020



Fig. 73: *Colchicum hungaricum* 'Velebit Star' flowering (Velebit – Croatia); February 2020

Fig. 74: *Colchicum hungaricum* corms (Dalmatia – Croatia); September 2020





Fig. 75: *Colchicum macrophyllum* flowering (Rhodes – Greece); October 2020



Fig. 76: *Colchicum macrophyllum* flowering (Rhodes – Greece); October 2020

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Fig. 77: *Colchicum montanum* flowering (Maestrazgo – Spain); August 2020



Fig. 78: *Colchicum montanum* corms (Spain); September 2020



Fig. 79: *Colchicum montanum* flowering (Spain); September 2020

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Figs. 80 & 81: *Colchicum pusillum* flowering (Naxos – Greece); October 2020

Figs. 82 & 83: *Colchicum sfikasianum* flowering (Southern Peloponnesus – Greece); September 2020



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Above, Fig. 84: *Colchicum triphyllum* flowering in the wild (Hadzhibey Estuary, Odessa – Ukraine); March 2015



Left, Fig. 85: *Colchicum triphyllum* flowering (Semnan – Iran); February 2020



Fig. 86: *Colchicum triphyllum* flowering (Tiligul Estuary, Odessa – Ukraine); February 2020



Fig. 87: *Colchicum triphyllum* corms (Eastern Crimea – Ukraine); September 2020

Fig. 88: *Colchicum triphyllum* corms (Semnan – Iran); September 2020





Fig. 89: *Colchicum turcicum* flowering (The Eastern Rhodopes – Bulgaria); September 2020



Fig. 90: *Colchicum turcicum* flowering (Macedonia – Greece); September 2020

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Fig. 91: *Colchicum variegatum*
flowering (Naxos – Greece);
October 2020



Above, Fig. 92: *Colchicum variegatum*
flowering (Ikaria – Greece);
October 2020



Fig. 93: *Colchicum variegatum* flowering (Naxos – Greece); October 2020

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Minor & Western Asia, Near East (Turkey, Iran):



Fig. 94: *Colchicum antepense* flowering (Gaziantep – Turkey); February 2020



Fig. 95: *Colchicum antepense* corms (Gaziantep – Turkey); September 2020



Fig. 96: *Colchicum antepense* flowering (Adiyaman – Turkey); March 2021



Fig. 97: *Colchicum atticum* flowering (Denizli – Turkey);
March 2021



Fig. 98: *Colchicum atticum* flowering
(Eskişehir – Turkey); March 2021



Fig. 99: *Colchicum atticum* corms (Denizli – Turkey);
September 2020



Figs. 100 & 101 : *Colchicum balansae*
flowering (Van – Turkey); August
2020



Fig. 102: *Colchicum burttii* flowering (Isparta – Turkey); March 2020

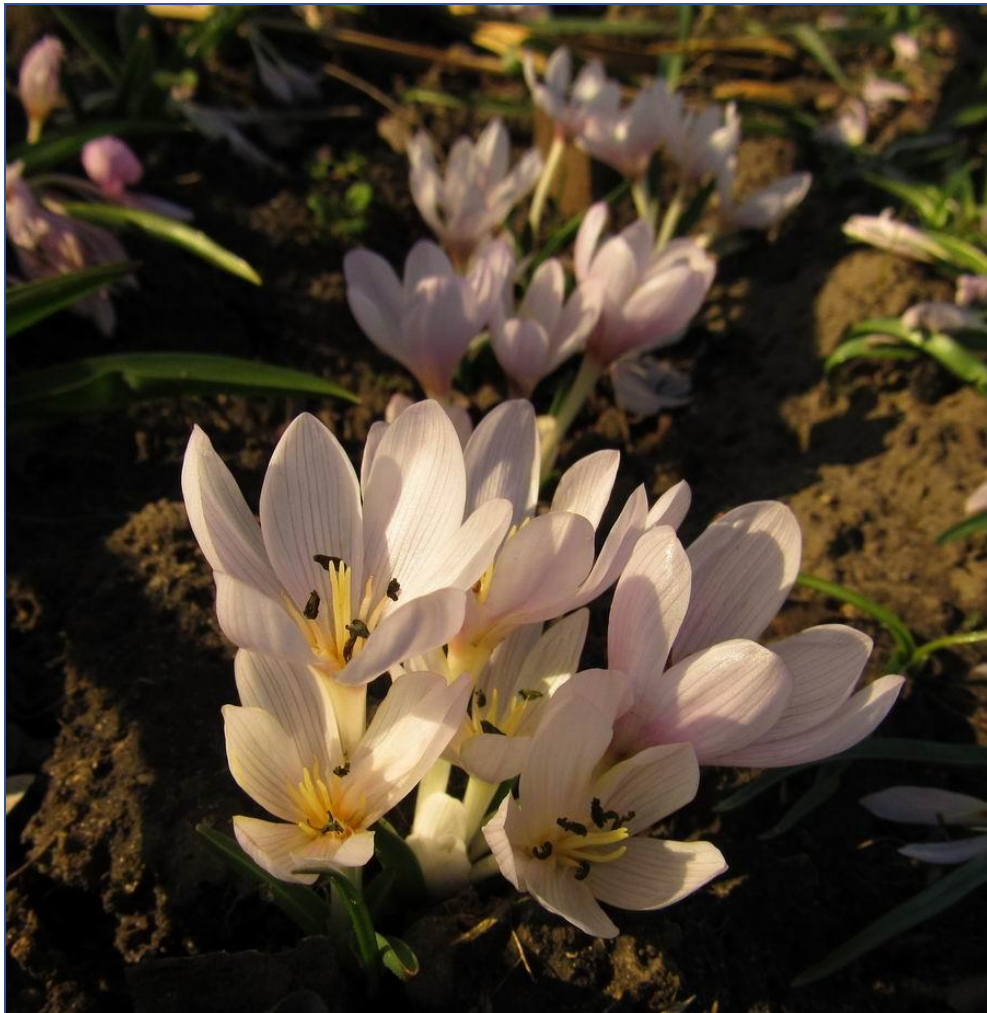


Fig. 103: *Colchicum burttii* flowering (Eskişehir – Turkey); March 2020



Fig. 104: *Colchicum burttii* flowering (Eskişehir – Turkey); March 2019

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Fig. 105: *Colchicum burttii* corms (Eskişehir – Turkey); September 2020



Fig. 106: *Colchicum crocifolium* corms (Kermanshah – Iran); September 2020



Fig. 107: *Colchicum crocifolium* flowering (Siirt – Turkey); March 2021



Fig. 108: *Colchicum crocifolium* flowering (Gaziantep – Turkey); March 2021



Fig. 109: *Colchicum crocifolium* flowering (Kermanshah – Iran); February 2020



Fig. 110: *Colchicum davisii* flowering (Adana – Turkey); September 2020



Fig. 111: *Colchicum figlalii* flowering (Muğla – Turkey); March 2019

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Left, Fig. 112: *Colchicum figlalii* flowering (Muğla – Turkey); March 2020

Below, Fig. 113: *Colchicum figlalii* corms (Muğla – Turkey); September 2020



Fig. 114:
*Colchicum
hirsutum* flowering
(Tunceli – Turkey);
February 2020



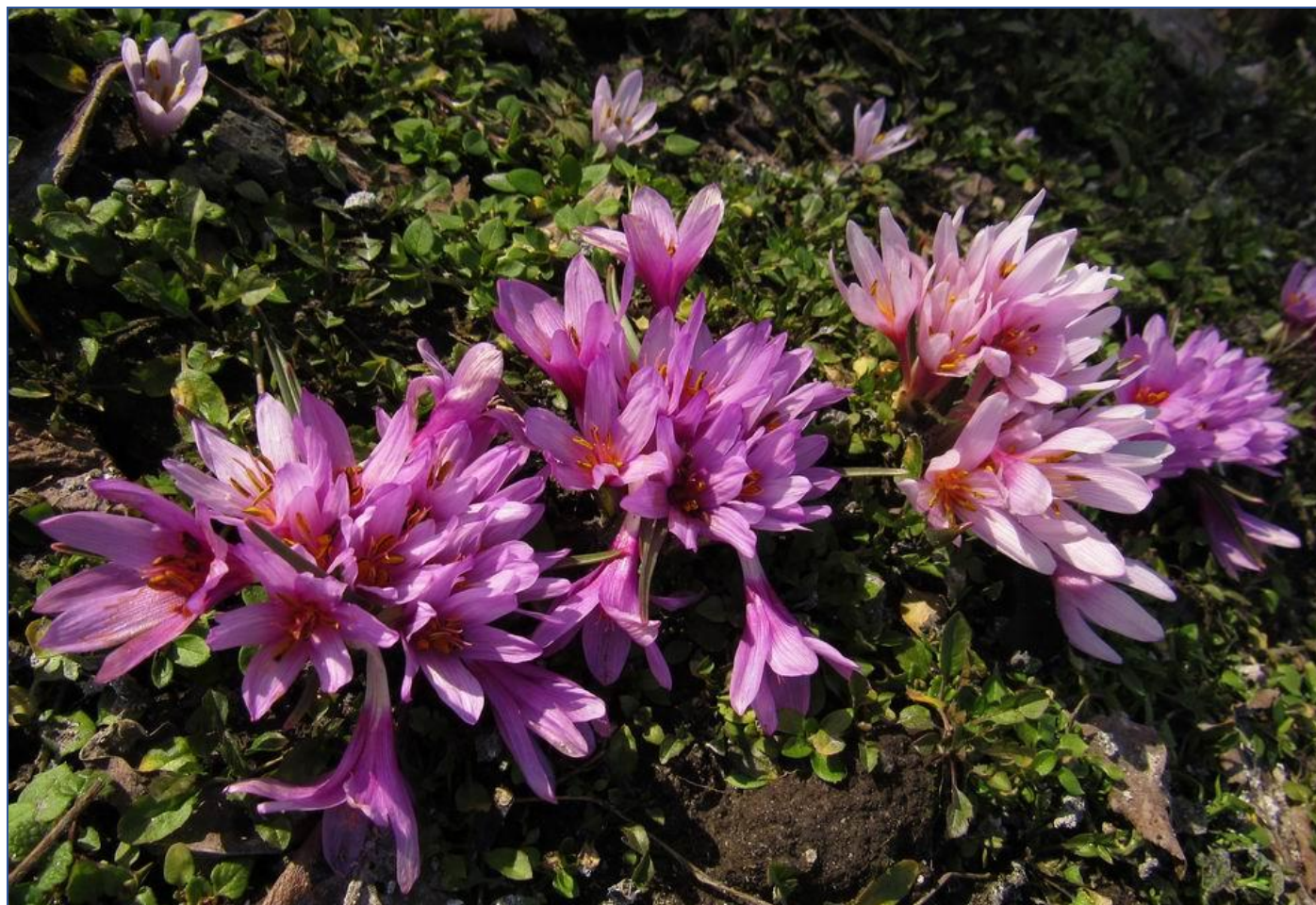


Fig. 115: *Colchicum hirsutum* flowering (Sivas – Turkey); March 2021



Fig. 116: *Colchicum hirsutum* corms (Sivas – Turkey); September 2020

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Fig. 117: *Colchicum kotschyi* flowering (Zanjan – Iran); September 2020

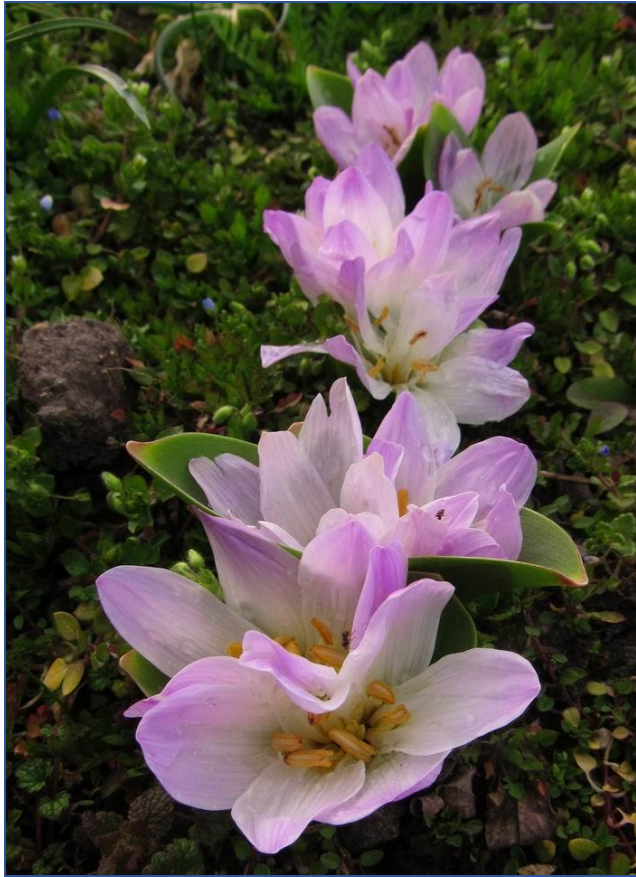


Above right, Fig. 118: *Colchicum kotschyi* (a pink form) flowering (Zanjan – Iran); September 2020



Fig. 119: *Colchicum kurdicum* flowering (Golestan – Iran); February 2020

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Figs. 120 & 121: *Colchicum kurdicum* flowering (Karabet Pass, Van – Turkey); April 2021



Fig. 122: *Colchicum kurdicum* corms (Karabet Pass, Van – Turkey); September 2020



Fig. 123: *Colchicum lagotum* corms (Erzurum – Turkey); September 2020

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Figs. 124 & 125: *Colchicum lagotum* flowering (Erzurum – Turkey); February 2020



Above left, Fig. 126: *Colchicum leptanthum* flowering (Erzurum – Turkey); February 2020

Above right, Fig. 127: *Colchicum leptanthum* flowering at Dr. Jānis Rukšāns' nursery (Tunceli – Turkey); March 2020



Fig. 128: *Colchicum leptanthum* corms (Erzurum – Turkey); September 2020



Fig. 129: *Colchicum manissadjianii* flowering (Amasya – Turkey); April 2021



Fig. 130: *Colchicum manissadjianii* corms (Amasya – Turkey); September 2020



Figs. 131 & 132: *Colchicum micaceum* flowering (Denizli – Turkey); September 2020

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Fig. 133: *Colchicum minutum* flowering at Dr. Jānis Rukšāns' nursery (Antalya – Turkey); March 2020



Fig. 134: *Colchicum minutum* corms (Antalya – Turkey); September 2020

Fig. 135: *Colchicum munzurense* corms (Tunceli – Turkey); September 2020



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Fig. 136: *Colchicum munzurense* flowering (Tunceli – Turkey); March 2020



Fig. 137: *Colchicum munzurense* flowering (Tunceli – Turkey); March 2010



Fig. 138: *Colchicum persicum* flowering (Markazi – Iran); September 2020



Fig. 139: *Colchicum persicum* flowering (Fars – Iran); September 2020

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Figs.140 & 141: *Colchicum sanguicolle* flowering (Muğla – Turkey); September 2020



Fig. 142: *Colchicum sanguicolle* flowering (Antalya – Turkey); September 2020

Fig. 143: *Colchicum serpentinum* flowering (Tunceli – Turkey); February 2020



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Fig. 144: *Colchicum serpentinum* flowering (Tunceli – Turkey); February 2020



Fig. 145: *Colchicum serpentinum* corms (Konya – Turkey); September 2020



Left, Fig. 146: *Colchicum serpentinum* flowering (Sivas – Turkey); February 2020



Right, Fig. 147: *Colchicum serpentinum* flowering (Konya – Turkey); February 2020



Figs. 148 & 149: *Colchicum sieheanum* flowering (Mersin – Turkey); September 2020



Fig. 150. *Colchicum soboliferum* flowering (Van – Turkey); March 2020



Fig. 151: *Colchicum soboliferum* corms (Van – Turkey); September 2020



Fig. 152: *Colchicum szovitsii* subsp. *brachyphyllum* flowering at Dr. Jānis Rukšāns' nursery (Gaziantep – Turkey); March 2020



Left, Fig. 153: *Colchicum szovitsii* subsp. *brachyphyllum* flowering (S Turkey); February 2020



Right, Fig. 154: *Colchicum szovitsii* subsp. *brachyphyllum* corms (Gaziantep – Turkey); September 2020

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Left, Fig. 155: *Colchicum varians* flowering (Markazi – Iran); March 2019

Right, Fig. 156: *Colchicum varians* (a white form) flowering (Markazi – Iran); March 2020



Fig. 157:
Colchicum varians
flowering (Markazi
– Iran); April 2021

Fig. 158: *Colchicum varians* corms (Markazi – Iran); September 2020



Fig. 159: *Colchicum wendelboi* flowering at Dr. Jānis Rukšāns' nursery (Bakhtiari – Iran); March 2020



Fig. 160: *Colchicum wendelboi* flowering (Lorestan – Iran); March 2020

Fig. 161: *Colchicum wendelboi* corms (Lorestan – Iran); September 2020



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Central Asia & Western Himalaya (NE Iran, Turkmenistan, Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan):



Fig. 162: *Colchicum alberti* flowering (Ala-Bel Pass, Chuy – Kyrgyzstan); March 2020

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Left, Fig. 163: *Colchicum alberti* 'Janis Ruksans' flowering at Dr. Jānis Rukšāns' nursery; March 2020
Right, Fig. 164: *Colchicum alberti* (Dr. Arnis Seisums selection: F2, clone 8) flowering (Tovil-Dara, Darwaz – Tajikistan); March 2021



Fig. 165: *Colchicum alberti* (Dr. Arnis Seisums selection: F2, clone 4) flowering (Tovil-Dara, Darwaz – Tajikistan); March 2020

Fig. 166: *Colchicum alberti* corms (Tovil-Dara, Darwaz – Tajikistan); September 2020



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Fig. 168: *Colchicum jolantae* flowering (Kopet Dag, North Khorasan – Iran); February 2020



Fig. 167: *Colchicum jolantae* flowering (Kopet Dag, Balkan – Turkmenistan); February 2020



Above right, Fig. 169: *Colchicum jolantae* corms (Kopet Dag, Balkan – Turkmenistan); September 2020

Fig. 170: *Colchicum jolantae* corms of different clones immediately after lifting (Kopet Dag – Turkmenistan & Iran); June 2020





Figs. 171 & 172: *Colchicum kesselringii* 'My Choice' flowering: Leonid Bondarenko selection from non-hybrid seedlings (Vakhsh – Tajikistan); March 2019

Fig. 173: *Colchicum kesselringii* 'Purple Star' flowering: Leonid Bondarenko selection from non-hybrid seedlings (Vakhsh – Tajikistan); March 2019



Fig. 174: *Colchicum kesselringii* flowering (Alay Valley - Kyrgyzstan); February 2020

Fig. 175: *Colchicum kesselringii* f. *albiflora* flowering (Alay Mountains, Fergana – Uzbekistan); March 2020



Fig. 176: *Colchicum kesselringii* corms (Alay Valley – Kyrgyzstan); September 2020



Fig. 177: *Colchicum luteum* flowering (Ala-Bel Pass, Chuy – Kyrgyzstan); April 2021



Fig. 178: *Colchicum luteum* flowering (Ala-Bel Pass, Chuy – Kyrgyzstan); March 2020



Fig. 179: *Colchicum luteum* 'Vahsh' flowering: Leonid Bondarenko selection from non-hybrid seedlings (Vakhsh – Tajikistan); March 2020



Fig. 180: *Colchicum luteum* 'Carrot Line' flowering: Leonid Bondarenko selection from non-hybrid seedlings (Vakhsh – Tajikistan); March 2020

Fig. 181: *Colchicum luteum* 'Vahsh' flowering: Leonid Bondarenko selection from non-hybrid seedlings (Vakhsh – Tajikistan) and *C. luteum* 'Lucky Selfmade': L. Bondarenko infraspecific hybrid of *C. luteum* × *C. luteum* f. *alba* 'Snow of Highland'; March 2020





Fig. 182: *Colchicum luteum* 'Lucky Selfmade': L. Bondarenko infraspecific hybrid of *C. luteum* x *C. luteum* f. *alba* 'Snow of Highland'; March 2020

Fig. 183: *Colchicum luteum* f. *alba* 'Yeti': Leonid Bondarenko selection from a wild material (Tajikistan); March 2020



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Fig. 184: *Colchicum luteum* f. *alba* 'Snow of Highland': Leonid Bondarenko selection from a wild material (Tajikistan); March 2020

Fig. 185: *Colchicum luteum* 'Vahsh' corms
September 2020



Fig. 186: *Colchicum luteum* corms (Ala-Bel Pass, Chuy – Kyrgyzstan); September 2020



Fig. 187: *Colchicum luteum* f. *alba* 'Snow of Highland' corms (Tajikistan); September 2020



Fig. 188: *Colchicum robustum* flowering (Kopet Dag, North Khorasan – Iran); February 2020



Fig. 189: *Colchicum robustum* flowering (Kopet Dag, North Khorasan – Iran); February 2020

Fig. 190: *Colchicum robustum* flowering (Kopet Dag, North Khorasan – Iran); February 2020





Fig. 191: *Colchicum robustum* flowering, a dark pink form (Kopet Dag, North Khorasan – Iran); February 2020



Fig. 192: *Colchicum robustum* flowering, a dark pink form (Kopet Dag, North Khorasan – Iran); February 2020

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Fig. 193: Mature flowering-sized corms of *Colchicum robustum* (on the left, large corms) compared to smaller mature *C. jolantae* corms (Kopet Dag, North Khorasan – Iran); September 2020



Fig. 194: Mature flowering-sized corms of *Colchicum robustum* (upper row corms) vs *C. jolantae* immediately after lifting (Kopet Dag, North Khorasan – Iran); June 2020